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

Preliminary Environmental Assessment
DOI-BLM-NV-W010-2013-0061-EA
August 2014

Florida Canyon Mining, Inc.
South Expansion Project

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Bureau of Land Management
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BLM

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ACRONYMS

°	Degrees
$\mu g/m^3$	Micrograms per Cubic Meters
43 CFR 3809	Title 43, Code of Federal Regulations, Part 3809
ACHP	Advisory Council on Historic Preservation
AIRFA	American Indian Religious Freedom Act
AMSL	Above Mean Sea Level
APO #20	Proposed Amended Plan of Operations #20
APO #18	Existing Plan of Operations #18
ARPA	Archeological Resources Protection Act
ART	Annual Refresher Training
BAPC	Bureau of Air Pollution Control
BLM	Bureau of Land Management
BMPs	Best Management Practices
BMRR	Bureau of Mining Regulation and Reclamation
CAAA	Clean Air Act Amendments of 1990
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	Cumulative Effects Study Area
CFR	Code of Federal Regulations
cfs	Cubic Feet per Second
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
$CO_2(e)$	Carbon Dioxide Equivalent
CWA	Clean Water Act
dB	Decibels
EA	Environmental Assessment
E-Cell	Evaporative Cell
EO	Executive Order

EPA	Environmental Protection Agency
ET	Evapotranspirative
F	Fahrenheit
FCAA	Federal Clean Air Act
FCMI	Florida Canyon Mining, Inc.
FLPMA	Federal Land Policy and Management Act of 1976
FNWA	Federal Noxious Weed Act
FR	Federal Register
ft^2	Square Foot
GHG	Greenhouse Gas
gpm	Gallons per Minute
GWP	Global Warming Potential
H:	Horizontal
HAP	Hazardous Air Pollutant
HDPE	High Density Polyethylene
Hg	Mercury
IM	Informational Memorandum
IMPROVE	Interagency Monitoring of Protected Visual Environments
IPCC	Intergovernmental Panel on Climate Change
MCP	Mercury Control Program
MFP	Management Framework Plan
MMt	Million Metric Tons
MOU	Memorandum of Understanding
Mt	Million Tons
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NAD 83	North American Datum 1983
NAGPRA	Native American Graves Protection and Repatriation Act of 1990
NDEP	Nevada Division of Environmental Protection
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act
NESHAP	National Emission Standard for Hazardous Air Pollutants

NHPA	National Historic Preservation Act
NO_2	Nitrogen Dioxide
NPDES	National Pollution Discharge Elimination System
NPM	Net Proceeds of Minerals
NRCS	Natural Resources Conservation Services
NRHP	National Register of Historic Places
NRS	Nevada Revised Statutes
NRV300000	FCMI's General Discharge Permit
NSAAQS	Nevada State Ambient Air Quality Standards
NSPS	New Source Performance Standards
NVMACT	Nevada Maximum Achievable Control Technology
O_3	Ozone
Pb	Lead
PFYC	Potential Fossil Yield Classification
PM_{10}	Particulate Matter with Aerodynamic Diameter less than 10 Microns
$PM_{2.5}$	Particulate Matter with Aerodynamic Diameter less than 2.5 Microns
ppb	Parts per Billion
ppm	Parts per Million
PSD	Prevention of Significant Deterioration
ROW	Right-Of-Way
RMP	Resource Management Plan
S-1	Solution Pond 1
S-2	Solution Pond 2
S-3	Solution Pond 3
SHLP	South Heap Leach Pad
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SPCC	Spill Prevention Control and Countermeasures Plan
SRCE	Standardized Reclamation Cost Estimator
SWCA	Steven W. Carothers & Associates
SWPPP	Storm Water Pollution Prevention Plan
SWRSF	South Waste Rock Storage Facility
TCP	Traditional Cultural Properties

Title V	Federal Operating Permit Program
tpy	Tons per Year
U.S.	United States
USCAR	U.S. Climate Action Report
USDA	U.S. Department of Agriculture
USDI	United States Department of the Interior
USFWS	United States Fish and Wildlife Service
UTM	Universal Transverse Mercator
V:	Vertical
VOC	Volatile Organic Compound
WPC Permit	State of Nevada Water Pollution Control Permit (NEV086001)
WRSF	Permitted Waste Rock Storage Facilities

1.0 INTRODUCTION

1.1 IDENTIFYING INFORMATION

1.1.1 Title, EA Number, Type of Project

Title: Florida Canyon Mining, Inc. South Expansion Project;

EA Number: DOI-BLM-NV-W010-2013-0061-EA.

The proposed South Expansion Project (Project) involves the expansion of an existing open pit; construction and operation of a heap leach pad; expansion of a waste rock storage facility; construction of various haul roads and access roads; and closure/reclamation of proposed facilities.

1.1.2 Location of Proposed Action

The Proposed Action is located at Jipangu International, Inc., Florida Canyon Mine approximately 35 miles northeast of Lovelock, Nevada and 42 miles southwest of Winnemucca, Nevada along Interstate 80; Pershing County, as presented on **Figure 1-1**.

The Florida Canyon Mine is located on both public land, administered by the Bureau of Land Management (BLM), and private land owned by Florida Canyon Mining, Inc. (FCMI).

The following parcels of land are public lands.

Township 31 North, Range 33 East, MDBM
Sections 1-4, 9-16, 37-39
Township 31½ North, Range 33 East, MDBM Section 35

Township 31 North, Range 33½ East, MDBM
Section 6
Township 32 North, Range 33 East, MDBM
Sections 33-35

The following parcels of land are privately owned by Florida Canyon Mining, Inc.

Township 31 North, Range 33 East

Section 1: SW/4, SE/2 of SE/4, Lot 5

Section 3: All

Section 9: East of Interstate Highway 80

Section 11: All except a 1.98 acre communication site in the NE/4NE/4NE/4 owned by:
AT&T
1450 Vassar St.
Reno, Nevada 89502

Section 13: West/2

Section 15: All

Township 32 North, Range 33 East

Section 33: That part of the SE/4SE/4 lying east of Interstate Highway 80

Section 34: That part of the W/2SW/4 lying east of Interstate Highway 80

Section 35: All (surface only)

1.1.3 Name and Location of Preparing Office

Lead Office – Humboldt River Field Office; Winnemucca District

5100 East Winnemucca Blvd., Winnemucca, NV 89445

1.1.4 Case File Number

NVN64628

1.1.5 Applicant Name

Florida Canyon Mining, Inc. (FCMI) is a wholly-owned subsidiary of Jipangu International Inc.

1.2 OVERVIEW

1.2.1 Site History

The Florida Canyon Mine is an open pit gold mine and heap leach operation which initiated activity in 1986. Various expansions to the original mine site have occurred over the years through the permit amendment process. To date, several planned modifications have been approved for the mine. These modifications include mine pit expansions and additional disturbance areas to accommodate waste rock storage facility expansion, cooling ponds, topsoil/growth media stockpiles, relocation of transmission lines, water production wells, road realignment, construction of a heap leach pad, and various minor adjustments in overall acreage permitted for disturbance. At the present time, the Plan of Operations Permit Boundary encompasses 5,522 acres. Total authorized disturbance for the mine is 2,054.7 acres; actual disturbance to date is 1,981.7 acres of which 1,014.5 acres are public land administered by BLM and 967.2 acres are private land controlled by FCMI as presented on **Figure 1-2**. The APO #20 Permit Boundary would slightly modify the APO #18 Permit Boundary; however, the acreage would remain the same. The proposed change to the boundary is displayed in **Figure 1-2**.

The existing disturbance areas for mine components are included in **Table 1-1**.

TABLE 1-1 Existing Surface Disturbance Acreage

Mine Facility	Public Land (ac)	Private Land (ac)	Total
Mine Pits	401.7	292.0	693.7
Waste Rock Storage Facilities	286.7	261.8	548.5
Heap Leach Pad	168.8	261.1	429.9
Process Ponds / Lined Ponds	4.0	14.3	18.3
Sediment Ponds / Unlined Ponds	14.2	11.8	26.0
Roads	35.7	62.0	97.7
Ancillary Facilities	68.5	53.7	122.2
Growth Media Stockpiles	34.9	10.5	45.4
Total Surface Disturbance	**1,014.5**	**967.2**	**1,981.7**

Source: ASWT 2013d

Existing mining facilities are presented in **Figure 1-3**, Florida Canyon Existing Mine Facilities.

1.2.2 Mining Operations

The Florida Canyon Mine operation consists of open pit mining using conventional mining methods to excavate waste rock and ore. FCMI has mined approximately 152.5 million cubic yards (yd^3) (228.8 million tons (Mt)) of waste rock since initiation of mining operations in 1986. Leach grade ore production over the period totaled approximately 134.1 million yd^3 (201.2 Mt). Six connected open pits have been designated within the mine area; Phase 4 Main Pit, Phase 5 Brown Derby Pit, Phase 6 Central Pit, Radio Tower West Pit, Jasperoid Hill Pit, and Switchback Pit.

With the exception of the Phase 4 Main Pit, all pits were dry during mining and no dewatering was required. Phase 4 Main Pit was previously mined to an elevation of 4,180 feet (ft.) above mean sea level (AMSL). Phase 4 Main Pit was backfilled in 2008 to an elevation of 4,450 ft. AMSL. Groundwater elevation at the time of backfill was approximately 4,435 ft. AMSL. Minor seeps from the pit walls resulted in some water accumulation at the pit bottom. Seep management in the Phase 4 Main Pit during mining operations commenced in 1994 with an average pumping rate of approximately 30 gallons per minute (gpm) required to maintain the pit operations. The water pumped was used for dust control within the pit. Backfilling was performed after operations ceased in that area and water from the seeps is no longer present.

Ore mined from the respective pits is transported to the heap leach facility for processing.

1.2.3 Ore Processing Facility

The heap leach and ore processing facility is comprised of an existing 429.9 acre heap leach pad, four solution ponds (S-1, S-2, Barren, and S-3), two contingency ponds, two cooling ponds, a carbon desorption (strip plant), five sets of carbon adsorption columns, and the process facility which consists of two electrowinning cells, two mercury retorts, a dore' furnace, and pumps/piping.

As presented in the approved State of Nevada Water Pollution Control Permit (NEV0086001) (WPC Permit), effective January 7, 2011 FCMI is authorized to process up to approximately 9 million yd^3 (14 Mt) of ore per year. The capacity of the current heap leach pad is 201.2 Mt. The ore is typically crushed, agglomerated, stacked, and leached using conventional heap leach cyanidation technology with precious metals recovery by carbon adsorption, stripping, electrowinning and refining.

The maximum allowable process solution flow rate to the existing heap leach pad facilities is 9,000 gpm at a solution surface application rate of 0.004 gpm/square foot (ft^2). Active mining of new ore ceased in April 2011; leaching of ore and processing of leach solution continues to the present time.

Portions of the existing heap leach pad have been recontoured and the south end of the pad has been reclaimed.

1.2.4 Waste Rock Storage

Permitted waste rock storage facilities (WRSF) include the South WRSF, North WRSF, Switchback WRSF, WRSF #1, WRSF #2, and WRSF #3. These facilities total approximately 531.5 acres and currently contain approximately 228.8 Mt of waste rock. A portion of waste rock generated during mining has been used to partially backfill Phase 4 Main Pit to an elevation

of 4,450 ft. AMSL to mitigate minor seepage from the pit walls. Water from the seeps is no longer present in the Phase 4 Main Pit.

WRSF's are initially constructed at the angle of repose (typically 1.3H: 1V) by end dumping down an advancing face or by placement of waste rock in successive horizontal lifts. The lifts range in height from 50 to 150 ft. For reclamation, the face of each WRSF is graded to achieve an overall slope of 3H: 1V.

Based on waste rock characterization studies completed to date, approximately 0.2 percent or 400,000 tons of the total volume of waste rock mined to date (approximately 228.8 Mt) is classified as potentially reactive (i.e., unoxidized/non-oxide sulphidic rock). Unoxidized or non-oxide waste rock, also known as potential acid generating (PAG) waste rock, is segregated from the oxide waste rock and placed in an isolation cell within the primary North WRSF. The isolation cell is designed to encapsulate the sulphidic rock within oxidized waste rock. The encapsulation is designed to limit sulphidic rock contact with water, air, and plant roots. The isolation cell is located at topographic highs within the North WRSF to avoid existing channels and low points where precipitation can be concentrated during storm events.

1.2.5 Water Management

With the exception of operation of a short duration dewatering system during mining of the Phase 4 Main Pit, mining operations at the Florida Canyon Mine do not require dewatering to maintain dry pit conditions. Surface water management consisting of run-off diversion and run-on control (collection ditch system and sediment ponds) is constructed and operated in accordance with FCMI's approved Storm Water Pollution Prevention Plan (SWPPP) administered by Nevada Division of Environmental Protection (NDEP).

1.2.6 Monitoring

Groundwater / Storm Water / Leak Detection

Active monitoring of groundwater and surface water is conducted by FCMI at the mine site. The monitoring program includes storm water, mine water supply wells, groundwater monitoring wells, process solutions, leak detection systems, and solution recovery systems. Monitoring protocols and locations are presented in the Monitoring and Sampling Plan (FCMI 2012) and the State of Nevada WPC Permit (NEV086001).

FCMI implements best management practices (BMPs) such as silt fences, water bars, ditches, and sediment ponds to control surface erosion and sediment from disturbed areas. Under FCMI's General Discharge Permit (NRV300000), the Florida Canyon Mine is designated as a "no discharge facility". Excessive precipitation and snow melt runoff is managed according to FCMI's SWPPP administered by NDEP.

In 2000, a contaminant plume comprised of process solution was discovered near the west side of the existing leach pad. Initially, the plume, consisting of weak acid dissociable (WAD) cyanide, mercury, and nitrates, was traced to leach pad solution channels. Repairs to the solutions channels resulted in a reduction in the plume extent. Between 2000 and 2014, additional leaks were identified at various locations including the Barren Pond, solution channels, and sumps. Repairs are actively being performed on facilities as they are identified as possible sources of leakage. Groundwater pumping down gradient of the defined plume area was

initiated to control the extent of the plume. Groundwater recovered from the pumping well is returned to the Barren Pond.

FCMI has developed a mitigation work plan and continues to work with NDEP and the BLM to address the plume and monitors the plume under requirements of its WPC Permit.

Rock Characterization

Monitoring is also conducted for rock characterization (geochemistry). Rock characterization monitoring is conducted in accordance with the WPC Permit.

Air Quality

FCMI maintains Air Quality Permits issued by the NDEP Bureau of Air Pollution Control (BAPC). The monitoring program associated with these permits includes daily opacities determination and recordation of precipitation and evaporation. Mitigation measures include implementation of dust control measures (watering and chemical stabilization); implementation of speed control measures on roads; and revegetation of completed portions of the Florida Canyon Mine.

Wildlife

Wildlife protection protocols and monitoring are conducted to meet Nevada Department of Wildlife (NDOW) requirements. FCMI reports observed wildlife mortalities to NDOW at the beginning of the day following the observation. Quarterly monitoring reports are filed with NDOW.

Noxious Weeds

Currently, routine weed control measures are implemented in the spring and fall and during vegetation establishment in order to limit the spread of noxious weeds. This ensures that the sites can be successfully reclaimed with desirable species. Noxious weed surveys are and would continue to be conducted every other year and are coordinated with BLM. Corrective measures are taken as directed by these agencies.

Lighting

In February of 2013, FCMI had a professional lighting contractor review and remediate light pollution sources at the Florida Canyon Mine. Results from the survey led FCMI to convert all lighting fixtures to Light-Emitting Diode (LED) specific fixtures. This resulted in an overall reduction of both Radiant and luminous Flux (CTS 2013). FCMI continues to monitor and evaluate the current lighting system at the mine site through digital photography and light meter measurements. Adjustments to the lighting system would be made where possible.

Paleontology

FCMI performs Annual Refresher Training (ART) for employees including fossil awareness and procedures to be taken if fossils are encountered during any mining processes.

Dust

Dust control measures, including watering and chemical stabilization, are implemented during mine operation to reduce the amount of fugitive dust.

1.2.7 Proposed Action

The Winnemucca District Office of the Bureau of Land Management (BLM) received a complete application to amend FCMI's Florida Canyon Mine Plan of Operations (NVN064628) and NDEP Reclamation Permit (No. 0126) on May 31, 2013. The proposed Amended Plan of Operations (APO #20) (Proposed Action) provides for expansion of open pit mining; expansion of waste rock storage facilities; construction and operation of a new heap leach pad and process ponds; operation of a crusher facility; construction of storm water diversion channels, ditches, and ponds; and closure/reclamation of these facilities. The components of the proposed amendment are collectively referred to as the South Expansion Project, Project or the Proposed Action in this document. The Florida Canyon Mine is located on public land administered by BLM and private land controlled by FCMI.

1.3 PURPOSE AND NEED FOR ACTION

The purpose of the Federal Action is to respond to FCMI's APO #20. FCMI's APO #20 includes the expansion of the open pit; construction and operation of a new heap leach facility; expansion of an existing waste rock disposal facility; construction of various haul roads and access roads; and closure/reclamation of mine facilities.

The need for action is established by BLM's responsibility under the 2008 Energy and Mineral Policy, Section 302 of the Federal Land Policy and Management Act of 1976 (FLPMA), and BLM Surface Management Regulations in 43 CFR 3809, to respond to a mining and exploration plan of operations and to take any actions necessary to prevent unnecessary or undue degradation of public land administered by BLM.

1.3.1 Decision to be Made

The decision the BLM would make based on this EA includes the following: whether or not to approve the proposed APO #20 to authorize the expansion and construction of ancillary facilities without modifications or additional mitigations; approval of the proposed APO #20 with additional mitigation measures that are deemed necessary by the BLM; approval of the proposed APO #20 with the proposed action replaced or modified by an alternative action; or deny approval of the proposed APO #20 and not authorize the proposed activities if it is found the proposed activities do not comply with 43 CFR 3809 regulations.

1.4 SCOPING, PUBLIC INVOLVEMENT, ISSUES

A scoping process was conducted in order to determine the scope of this environmental analysis. A 30-day public scoping period was initiated on July 23, 2013, and concluded on August 23, 2013. An internal scoping meeting was held on Oct. 23, 2013. Five scoping letters were received from private individuals, state agencies, and interested parties. Through internal and external scoping, the following issues were identified with regard to the Proposed Action:

- What potential effects does the Proposed Action have on groundwater contamination?
- What cumulative impact does the Proposed Action have on wildlife?
- What potential effects does the Proposed Action have on air quality?
- How would the Proposed Action affect invasive and nonnative plant species?
- Would the Proposed Action have any effects on existing Paleontological sites?
- How would the Bighorn Sheep be impacted by the Proposed Action?

- How would the Proposed Action impact recreation?
- How would the Proposed Action impact the Dark Skies site?
- How would lighting be managed to reduce light pollution?
- Would the Proposed Action interfere with geothermal leases?
- Would range improvements be impacted by the Proposed Action?
- Would the Proposed Action interfere with livestock trailing?
- How would the Proposed Action affect economic and social values?
- Would the Proposed Action have any effects on the visual aspects from the Historic Trails in the area?
- Would the proposed locations of the rock crusher and other large equipment have an impact on noise and dust pollution?
- Would the proposed action have a visual impact on geological formations in the range in the nearby area?

Scoping issues concerning surety bonds and a Long-Term Trust Fund were considered, but are not relevant within the scope of NEPA. These issues are not elements of the human environment that are to be analyzed. Therefore these issues were not evaluated within this EA.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

FCMI proposes to expand mining operations at the Florida Canyon Mine by mining identified ore reserves in areas adjoining the existing Phase 4 Main and Jasperoid Hill pits. The proposed Project would encompass approximately 1,288 acres (693 acres of public land administered by BLM and 595 acres of private land owned by FCMI) as presented in **Figure 2-1**, and referred to herein as the Project Area. **Table 2-1** lists the acreages of surface disturbance by mine component for the Proposed Action. The Proposed Action includes the following components:

- Revision of the Existing Plan of Operation APO #18 permit boundary;
- Phase 7 Pit (expansion of the existing Phase 4 Main and Jasperoid Hill pits);
- Expansion of the South Waste Rock Storage Facility;
    - Modification of Existing South Waste Rock Storage Facility;
- Development of the proposed South Heap Leach Pad including fluid management ponds and carbon column;
- Development of a South Crusher and Yard;
- Four storm water diversion channels and a dispersion ditch;
- Two evapotranspirative cover borrow sources;
- Sediment Pond 9;
- Stockpiles for salvaged growth media, evaporative media, and rip-rap; and
- South haul and access roads.

TABLE 2-1 Summary of Proposed Surface Disturbance

Proposed Mine Facility	BLM Land (acres)	Private Land (acres)	Subtotal (acres)	New Disturbance (acres)
Phase 7 Pit[1]	92.2	312.6	404.8	55.0
South Waste Rock Storage Facility Expansion[2]	231.1	84.9	316.0	247.4
South Heap Leach Pad	263.8	39.9	303.7	303.7
South Process Ponds and Carbon Column	8.8	7.6	16.4	16.4
South Crusher Facility	2.7	0.0	2.7	2.7
Diversion Channels and Dispersion Ditch	11.0	27.3	38.3	38.3
Cover Soil Borrow Sources	8.3	31.4	39.7	39.7
Sediment Pond	0.0	5.1	5.1	5.1
Growth, Evaporative Media, and Rip-Rap Stockpiles	8.7	10.1	18.8	18.8
South Access and Haul Roads	23.3	23.7	47.0	47.0
Ancillary Mine Facilities	43.4	52.4	95.8	95.8
TOTAL	**693.3**	**595**	**1,288.3**	**869.9**

Source: ASWT 2013d
1) Of Total 404.8 acres, 349.8 acres are existing disturbance and 55.0 acres would be new disturbance
2) Of Total 316.0 acres, 68.6 acres are existing disturbance and 247.4 acres would be new disturbance

Approximately 89 Mt of ore and 37.5 Mt of waste rock would be excavated from the proposed Phase 7 Pit. Ore would be placed on the proposed South Heap Leach Pad (SHLP) and waste

rock would be placed on the SWRSF. Approximately 5.5 Mt of the waste material to be removed from the pit is alluvium which would be stockpiled for use as growth media.

Mining is expected to occur over an eight to ten year period followed by two to three years of reclamation activity.

2.1.1 Revision of Existing Plan of Operation APO #18 Permit Boundary

The Proposed Action includes a modification of the limits of permitted disturbance boundary at the Florida Canyon Mine. The proposed revision to the permit boundary would not increase the overall disturbance acreage; the proposed expansion would include the addition of area in the southwest corner of the current permitted boundary (encompassing approximately 33.21 acres) and the removal of an area to the south (covering approximately 33.21 acres); resulting in a net 0-acre change in total Plan of Operations area.

2.1.2 Phase 7 Pit

Exploration activities have identified additional ore reserves adjoining the Phase 4 Main Pit to the south and encompassing the Jasperoid Hill Pit to the east. Mining these additional ore reserves would result in the proposed Phase 7 Pit. The proposed Phase 7 Pit would have a surface disturbance of approximately 405 acres of which approximately 350 acres have previously been disturbed. The proposed pit would also include an additional 55 acres of new disturbance (6.6 acres of public land and 48.3 acres on FCMI private land). The proposed Phase 7 Pit would be mined using conventional open pit mining methods and would be constructed to withstand geologic and climatic conditions. The proposed pit would result in a pit bottom elevation of 4,460 ft. AMSL. **Figure 2-2** presents cross-section locations through selected proposed mine facilities. **Figure 2-3** presents cross-sections of the proposed full build-out of the Phase 7 Pit in relation to the existing groundwater table. The proposed Phase 7 Pit would be mined to a depth approximately 25 ft. above the averaged measured groundwater elevation.

2.1.3 South Waste Rock Storage Facility Expansion

FCMI is proposing to expand the South Waste Rock Storage Facility (SWRSF) for placement of waste rock generated from the proposed Phase 7 Pit. The proposed SWRSF expansion would encompass approximately 316 acres (231 acres of BLM-managed public land and approximately 85 acres of FCMI's private land). The SWRSF expansion would consist of approximately 247 acres of new disturbance (comprising of 177 acres BLM-managed land and 70 acres on FCMI private land) and approximately 69 acres of previously permitted disturbance.

Waste rock excavated from the proposed Phase 7 Pit expansion would be hauled to the SWRSF. FCMI would construct the proposed SWRSF Expansion in successive 50 ft. high benches using overall 1.3H: 1V slopes, and 85 ft. setbacks between each bench.

Cross-sections of the proposed SWRSF Expansion design for the pre-construction and post-construction configurations are presented on **Figure 2-4**

SWRSF Slope Stability Analysis

A slope stability analysis of the SWRSF Expansion (ASWT 2013a) was conducted to determine the full build out (pre-reclamation/post-construction) design configuration. The most critical cross-section analyses exhibits an overall 3H: 1V slope angle with a maximum height of 310 ft.

above grade and a base grade of 11 percent. Results of the slope stability analysis indicate slopes are stable as designed (ASWT 2013a).

Modifications to Existing SWRSF

Approximately 196 acres of the existing SWRSF would be modified by the proposed Phase 7 Pit and SWRSF Expansion. Surface disturbance associated with the existing SWRSF would be reduced to approximately 25 acres. Implementation of APO #20 would result in relocation of waste rock material currently placed in the existing SWRSF to the proposed South Heap Leach Pad (SHLP) for leaching, based on ore grades and economics, or within the proposed SWRSF expansion area.

Special Sulphide (Non-Oxide) Waste Rock Management

Total anticipated volume of sulphide waste rock material to be generated under the Proposed Action is approximately 174,292 yd^3 (261,438 tons). Sulphide-bearing material would be placed in sulphide cells encapsulated by oxide waste within the proposed SWRSF Expansion. The cells would be designed to isolate potentially reactive rock from water, air, and plant root zone. The cells would be constructed to a maximum thickness of 20 ft. high between 50 ft. lifts of oxide material. Following placement of the oxide material, 1 ft. of growth media may be applied to the graded surface. The surface of the waste rock storage facility would be graded to a minimum slope of 2 percent, away from the reclaimed crest and toward the existing ground surface to promote run-off. Construction of diversion channels would prevent storm water run-on from contacting potentially reactive material. **Table 2-2** presents the anticipated mining sequence for the sulphide material associated with the Proposed Action.

TABLE 2-2 Mining Sequence Sulphide Material

Time Period	Anticipated Volume (yd^3)	Anticipated Volumes (Tons)
Year 1	0	0
Year 2	0	0
Year 3	5,833	8,749.5
Year 4	19,167	28,750.5
Year 5	11,000	16,500
Year 6	138,292	207,438
Year 7	0	0
Year 8	0	0
TOTAL	**174,292**	**261,438**

Source: ASWT 2013d

2.1.4 South Heap Leach Pad Facility

Ore recovered from the proposed Phase 7 Pit would be processed at the proposed SHLP. The proposed SHLP would be constructed in three phases. Phase 1 is the northernmost section of the SHLP, as shown on **Figure 2-1**. Phase 1 would have the capacity to accommodate 23.9 Mt encompassing approximately 102.9 acres (91.5 acres of public land and 11.4 acres of private land). Phase 1 capacity is anticipated to be reached approximately three years following beginning of mining. The final configuration of the proposed facility (including all three phases) would have the capacity to contain 84.3 Mt of ore encompassing approximately 303.7 acres (263.8 acres of public land and 39.9 acres of private land). The SHLP would be designed with 20 ft. high benches with an overall slope of 3H: 1V to accommodate a maximum heap height of

200 ft. above the existing grade as presented on **Figure 2-5**. The SHLP would be lined with a high density polyethylene (HDPE) geomembrane. Beneath the HDPE liner would be a minimum 1 ft. compacted low hydraulic soil material in accordance with NDEP regulations. The SHLP would be equipped with a leak detection system. The lined area for all three phases of the SHLP would be approximately 13.44 million ft^2; each phase consisting of approximately 4.48 million ft^2 of lined surface area.

SHLP Slope Stability Analysis

A slope stability analysis was performed on Florida Canyon's proposed SHLP Phase 1 (ASWT 2013a). The most critical section, the slope with the steepest base grade and greatest maximum height, was identified and analyzed for stability. This coincided to a cross-section with an overall slope of 3H: 1V with a maximum height of 200 ft. above the liner and a base grade that ranges from six to eight percent. The results from the slope stability analysis indicate slopes are stable as designed.

South Area Process Ponds and Carbon Column

FCMI proposes to construct three process ponds (South Barren Pond 1, South Process Pond 1, and South Contingency Pond 1) to support heap leach pad solution management. The proposed ponds and carbon column would encompass approximately 16.4 acres of new surface disturbance (8.8 acres located on BLM-administered public land and 7.6 acres of private land owned by FCMI).

SHLP process solution would be managed in a separate circuit from existing facilities at Florida Canyon Mine. Process solution would be collected and transmitted to a network of process ponds via open solution ditches. Cyanide solution would be pumped from the proposed South Barren Pond 1 to the SHLP. The pregnant solution would gravity flow from the bottom of the leach pad to the proposed South Process Pond 1 before being pumped to and filtered through the proposed South Carbon Columns. The stripped solution would be returned to the proposed South Barren Pond 1 and the loaded carbon from the carbon columns would be replaced with fresh carbon. The loaded carbon would be transported to an existing process facility at the Florida Canyon Mine for further processing.

Although the SHLP would be constructed in three phases, the proposed South Area Process Ponds would be fully constructed to manage the maximum potential solution generated by the entire SHLP facility.

In addition to the volume of process solution associated with leach pad operation, the proposed ponds are designed to contain storm water run-off from the SHLP resulting from a 25-year, 24-hour storm event. The pond embankments would be sloped at a 3H: 1V angle. Total operational capacity for all ponds is approximately 33 million gallons. Each pond is designed with 5 ft. of freeboard for an additional 18 million gallons of storage capacity; increasing the proposed pond network storage capacity to 51 million gallons. Pond dimensions, surface area, and storage capacity volume for each proposed process pond is presented in **Table 2-3**.

TABLE 2-3 Process Pond Details					
Year	**Length (ft.)**	**Width (ft.)**	**Depth (ft.)**	**Top of Pond Surface Area (acres)**	**Operational Capacity (million gallons)**
South Barren Pond 1	217.0	362.0	17.0	1.8	4.8
South Process Pond1	757.0	362.0	17.0	6.3	19.2
South Contingency Pond1	367.0	362.0	12.0	3.0	9.0

Source: ASWT 2013d

The proposed ponds would be double-lined and equipped with a leak detection system in accordance with NAC 445A.435. Bird netting would be placed over the process ponds and open solution channels to reduce the potential for wildlife to contact process solution.

Abandonment of Existing Monitoring Wells within Facility Footprints

Monitoring well MW-14, established by FCMI, and the geothermal temperature monitoring well Geo-Well, established by Presco Energy, LLC. are currently located within the footprints of the proposed Carbon Column and the SHLP, respectively. MW-14 and the Geo-well need to be abandoned prior to implementation of construction of the respective components. The wells would be abandoned in accordance with federal and state laws, and abandonment would be performed by a licensed State of Nevada Well Driller. FCMI and Presco Energy, LLC. would coordinate the abandonment of each well, respectively.

The proposed finish design grades have been reviewed and the existing well casings would be removed to a depth greater than or equal to 7 feet below finish design grades. The locations of the existing wells to be abandoned are presented on **Figure 2-1.**

2.1.5 South Crusher and Yard Facility

The proposed South Crusher and yard facility would be located north of the proposed SHLP Phase 1 as shown on **Figure 2-1**. The proposed crusher area (including yard) would create approximately 2.7 acres of new surface disturbance located on BLM-administered public land. FCMI proposes to use similar crusher and equipment types as previously installed at the Florida Canyon Mine.

2.1.6 Storm Water Diversion Channels and Dispersion Ditch

FCMI proposes to construct four diversion channels to capture run-on/run-off water. The diversion channels would be constructed within 18 months of commencement of activities associated with the Proposed Action.

Non-Contact Water Channels

Surface water that would not be in contact with mine facilities would be managed by storm water diversion channels redirecting potential surface water away from and down gradient of mining operations. The proposed Non-Contact South Diversion Channel and the Florida Canyon Diversion Channel would intercept water from Florida Canyon, Wiley Gulch, Piedmont Canyon, Johnson Canyon, and an unnamed canyon. These two channels would convey non-contact water to the south of the proposed SWRSF and SHLP to a proposed Dispersion Ditch 1. Surface disturbance associated with the proposed Non-Contact South Diversion Channel is approximately 23.0 acres (5.8 acres public land and 17.2 acres private land). Design for the proposed Non-Contact South Diversion channel assumes an average constructed width of 45 ft.

along the entire channel alignment with a depth ranging from 3.5 ft. to 5.0 ft. The proposed 22,256 ft. long channel would require placement of rip-rap material in selected areas where high water velocity is anticipated and where native/natural ground requires reinforcement to be geotechnically stable as described in Chapter 2.1.6 *'Storm Water Channel Rip-Rap'.*

The proposed Florida Canyon Diversion Channel would consist of a shorter channel section located up-gradient of the proposed Non-Contact South Diversion Channel. Construction of the proposed Florida Canyon Diversion Channel would result in approximately 0.3 acres of new disturbance located on private land. An additional estimated 0.4 acres of disturbance would be required for construction of ancillary facilities associated with the proposed channel.

Non-contact water would be conveyed to the proposed Dispersion Ditch 1. Dispersion Ditch 1 would encompass approximately 5.5 acres of new disturbance (0.6 acres of public land and 4.9 acres of private land).

Contact Water Channels

Storm water (run-off) generated within the active mine area would be managed with separate diversion channels and directed to sediment ponds. The ponds would be designed to prevent discharge of collected run-off water into the existing environment.

Run-off water originating from the southern slope of the proposed SWRSF would be directed to the proposed Contact South Diversion Channel 1 and run-off water from the western slope of the proposed SWRSF would be directed to the proposed Contact South Diversion Channel 2.

The proposed Contact South Diversion Channel 1 would be approximately 10,632 ft. long. Area of disturbance associated with the proposed channel would be 6.6 acres (1.8 acres of public land and 4.8 acres of private land). The proposed Contact South Diversion Channel 1 would have an average width of 27 ft. along the entire channel alignment with a depth ranging from 1.5 to 2.0 ft. Ancillary disturbance associated with construction of the channel would result in an additional disturbance area of approximately 12.9 acres (6.3 acres of public land; 6.6 acres of private land).

The proposed Contact South Diversion Channel 2 would be approximately 4,700 ft. long. The channel would occupy 2.9 acres of new surface disturbance (2.5 acres of public land and 0.4 acres of private land). The proposed Contact South Diversion Channel 2 would have an average width of 27 ft. along the entire channel alignment with an approximate depth of 2.0 ft. Construction of the proposed channel would generate an additional 5.7 acres (4.8 acres of public land; 0.9 acres of private land) of ancillary disturbance.

Portions of the proposed channels may be lined with rip-rap based on the volume of water expected in the channels, velocity of the water, and characteristics of the native ground as described in Section 2.1.6 *Storm Water Channel Rip-Rap.*

Storm Water Channel Rip-Rap

Specific areas of the diversion channels would require placement of rip-rap material to minimize channel erosion and provide energy dissipation for flow associated with the design storm events. FCMI would use existing stockpiled oxide waste rock as rip-rap material. Material excavated during the construction of the proposed channels would also be stockpiled for use as erosion control. **Figure 2-1** shows the proposed location for the rip-rap stockpile south of the proposed SHLP. Approximately 1,700 yd^3 of rip-rap (18-24 inches in diameter) would be required for construction of the proposed channels. Since construction of the channels associated with the

Proposed Action would be conducted within the first 18 months of activities, no additional surface disturbance would be generated for the temporary stockpile.

2.1.7 Evapotranspirative Cover Borrow Sources

Two borrow sources would be developed to provide evapotranspirative (ET) cover soil for the SHLP. Borrow sources would be located north and south of the proposed SHLP as presented on **Figure 2-1**, and would disturb approximately 11.5 acres of FCMI-owned land and 28.2 acres (8.3 acres on public land and 19.9 acres of private land) for north and south borrow sources, respectively. Approximately 1,097,000 yd^3 of cover material would be available from the proposed south borrow source and approximately 357,000 yd^3 from the proposed north borrow source (ASWT 2013c).

2.1.8 Sediment Pond 9

The proposed Sediment Pond 9 would be located south of the proposed SHLP as presented on **Figure 2-1**. The proposed facility would encompass approximately 5.1 acres of surface disturbance (located on FCMI private land). The proposed sediment pond would be unlined and designed to contain the water volume (from the proposed contact water channels) from a 100-year, 24-hour storm.

2.1.9 Growth Media, Evaporative Media, and Rip-Rap Stockpiles

The proposed growth media stockpile would be located southwest of the proposed SWRSF as presented on **Figure 2-1**. The proposed rip-rap stockpile would be constructed within the allocated surface disturbance for the southern proposed ET cover soil borrow source area. Existing oxide waste rock material could potentially be used as rip-rap material and rock excavated during the construction of the proposed channels would be stockpiled and potentially used for rip-rap material. Rip-rap material would need to be 18-24 inches in diameter. The proposed evaporative media stockpile would be located near the northwest corner of the proposed SHLP as presented on **Figure 2-1**. Evaporative media would be used for construction of evaporative cells (E-Cell) during reclamation.

2.1.10 Haul and Access Roads

Additional haul roads and access roads would be constructed to support mining operations associated with the Proposed Action. The proposed roads have been designed to accommodate the largest anticipated truck traffic.

The South Haul Road would result in 6.7 acres of surface disturbance (4.2 acres of public land and 2.5 acres of private land). The proposed haul road would be 116 ft. wide including a travel width of 90 ft. and 13 ft. wide berms.

The proposed South Major Access Road would be constructed with a total road width of 55.6 ft., travel width of 40 ft., and 7.8 ft. wide safety berms. The major access road would encompass a total of 35.7 acres (17.7 acres of public land and 18.0 acres of private land).

The proposed Minor Access Roads would be constructed with a total road width of 27.8 ft. including a travel road width of 20 ft. and 3.9 ft. wide road berms. The minor access road network would encompass a total of 4.6 acres of additional surface disturbance (1.4 acres of public land and 3.2 acres of private land).

2.1.11 Environmental Protection Measures

FCMI has committed to the following environmental protection measures to prevent unnecessary and undue environmental degradation during construction, operation, and reclamation activities associated with the Proposed Action. The measures are derived from the general requirements established in 43 CFR 3809, as well as other water, air quality, and environmental protection regulations.

Air Emissions

Appropriate air quality permits would be obtained from NDEP Bureau of Air Pollution Control (BAPC) for land disturbance, use of generators, and use of the aggregate screen and crusher. As per BAPC regulations, the Project air quality operating permit must be authorized by the BAPC prior to commissioning.

Committed air quality practices would include dust control for mine operations as described by the BAPC required Fugitive Dust Control Plan which would be included under the Surface Area Disturbance (SAD) permit. FCMI would apply for the SAD permit closer to the Project start date, if approved. In general, the Fugitive Dust Control Plan would provide for speed limits, water application on haul roads and other disturbed areas, seeding growth media stockpiles, and other dust control measures as accepted and reasonable industry practice. Disturbed areas would be seeded with an interim seed mix to minimize fugitive dust emissions where appropriate. Also, trucks carrying crushed ore from the site would be covered with a tarp to control dust.

Lighting

FCMI would reduce light pollution and impacts to visual resources to the extent practicable by screening light sources, directing light towards intended targets, and placing lights at the lowest practical height. Diesel-generator powered light plants would measure approximately 30 feet tall when in use. Lighting would only be used during active mining or exploration operations in accordance with MSHA regulations. Light plant masts would be lowered (to a horizontal position, if possible) daily when not in use. They may also be stored in a lowered position at the office/first-aid, parking, and ready line area or removed from the site when not in use.

Cultural Resources

Any cultural resource discovered by the permit holder, or any person working on their behalf, during the course of activities on federal land would be immediately reported to the authorized officer by telephone, with written confirmation. The permit holder would suspend all operations in the immediate area of such discovery and protect it until an evaluation of the discovery can be made by the authorized officer. This evaluation would determine the significance of the discovery and what mitigation measures are necessary to allow activities to proceed. The holder would be responsible for the cost of evaluation and mitigation. Operations may resume only upon written authorization to proceed from the authorized officer.

Native American Religious Concerns

If traditional cultural objects, tribal resources, or sacred materials are identified within or in close proximity to the Project Area, FCMI would contact the BLM. The BLM would conduct consultation with the affected Tribe(s) to determine if avoidance is possible or if other mitigation

measures are required as appropriate. The BLM would advise FCMI as to when they could proceed with work in the area.

Paleontological Resources

If paleontological resources are identified at the Project Area, activities would cease in the immediate vicinity of the find and notification would be made immediately to the BLM Authorized Officer. Actions by the BLM could include mitigating measures such as data recovery, restrictions on development, and deletion of some areas from development on a case by case basis. In accordance with 43 CFR §3809.420(8)(ii), "the authorized officer shall evaluate the discoveries brought to his/her attention, take action to protect or remove the resource, and allow operations to proceed within ten working days after notification to the authorized officer of such discovery."

Erosion and Sediment Control

FCMI would construct storm water structures to prevent run-on water from entering disturbed areas or areas otherwise in use for mining activities. Berms and/or storm water diversion channels would be constructed around the pits. Other temporary storm water control structures and BMPs would be constructed and installed as needed to prevent degradation to identified surface water resources from run-off water until perennial vegetation can be re-established.

BMPs would be used to limit erosion and reduce sediment in precipitation run-off from proposed Project facilities and disturbed areas during construction, operations, and initial stages of reclamation. BMPs used during construction and operation to minimize erosion and control sediment runoff may include:

- Surface stabilization measures- dust control, mulching, riprap, gravel on access roads, temporary and permanent revegetation/reclamation, and placing growth media;
- Run-off control and conveyance measures -hardened channels, run-off diversions; and
- Sediment traps and barriers - check dams, grade stabilization structures, sediment detention basins, sediment/silt and straw bale barriers, and sediment traps.

Storm water diversion channels would be constructed around the open pits to divert up-gradient run-on water from entering. Precipitation could also collect in the pits. In the event that incidental water does occur in the pit, it would collect within a constructed low zone and be left to evaporate naturally. Re-vegetation of disturbed areas would reduce the potential for wind and water erosion. Following construction activities, areas such as cut-and-fill embankments and growth media stockpiles would be seeded as soon as practicable and safe. Concurrent reclamation would be maximized to the extent practicable to accelerate re-vegetation of disturbed areas. Sediment and erosion control measures would be inspected periodically, and repairs performed as needed.

Monitoring of storm water structures and sediment control BMPs would occur periodically throughout the life of the mine and after precipitation events.

Petroleum Products/Hazardous Materials/Solid and Liquid Waste

Petroleum and equipment maintenance products would be transported and used by FCMI in accordance with federal, state, and local regulations. Hazardous materials as defined by the Comprehensive Environmental Response, Compensation, and Liability Act regulations (40 CFR

302.4) include petroleum motor fuels and lubricants, antifreeze, and solvents which are used on the site. FCMI employees would be trained in the proper transportation, use, and disposal. Wastes generated on-site would be managed by FCMI and disposed of in accordance with state and federal regulations.

FCMI would be responsible for the disposal of all waste materials including used hydrocarbons. Used solvents, hydrocarbons, and antifreeze would be accumulated, labeled, and disposed of in compliance with applicable state and federal regulations.

A Spill Prevention, Control and Countermeasures (SPCC) Plan (ASWT 2013e), describing the methods for spill prevention, cleanup, and abatement of petroleum hydrocarbon or other equipment maintenance material spill, is included as Appendix B of APO#20 (ASWT 2013d). This plan would be made readily available on-site before operations begin. Spills would be immediately reported to both the BLM and the NDEP. All contaminated soil would be secured and disposed of according to state and federal regulations.

Hazardous materials found on site as a result of gold extraction processes include sodium cyanide, sodium hydroxide, hydrochloric acid, lime, flocculent, and anti-scalant. These hazardous materials are currently being used at the mine site daily. These reagents are transported, transferred from trucks to containers and containment areas, used, and disposed of according to federal and state regulations.

Common office and non-hazardous waste would be collected and disposed of in an existing on-site Class III landfill.

Monitoring

During operations, annual qualitative monitoring of multiple key indicators of site stability of concurrently reclaimed areas would be conducted. These key stability indicators may include revegetation and presence of noxious/invasive weeds, surface erosion, sedimentation, slope stability, and wildlife parameters.

Growth Media Storage and Stockpile Management

Approximately 949,000 cubic yards of growth media would be salvaged and stockpiled during the development of mine facilities. Stripped growth media encountered would be stockpiled within designated areas as shown in **Table 2-6**. Growth media stockpiles would be located such that mining operations would not disturb them.

The surfaces of the stockpiles would be shaped during construction to reduce erosion. To further minimize wind and water erosion, the growth media stockpiles would be seeded after shaping with a seed mix approved by the BLM. BMPs such as silt fences or certified weed-free straw bales would be used, as necessary, to contain sediment resulting from direct precipitation.

Vegetation and Non-Native Invasive Species

Areas of surface disturbance associated with the Proposed Action would be reclaimed pursuant to a reclamation plan approved by the BLM and the NDEP. Activities would include recontouring of disturbed areas and seeding with a BLM-approved seed mix.

A noxious weed monitoring and control plan would be implemented during construction and continue through operations. FCMI contains management strategies, treatment, and treatment evaluation for noxious weeds and invasive species. The results from annual monitoring would be

the basis for updating the Noxious and Invasive Species Management Plan and developing annual treatment programs.

Equipment would be washed by contractors prior to entering the site for the first time in order to remove noxious weed seeds carried from the last location.

Migratory Birds

Land clearing or other surface disturbances associated with the Proposed Action would be conducted outside of the migratory avian breeding season, whenever feasible, to avoid potential destruction of active bird nests. Nests are protected and considered active if they contain eggs or young or if evidence of reproductive behavior (i.e. mated pairs, courtship displays, territorial defense, carrying nesting materials, transporting food, etc.) under the Migratory Bird Treaty Act of 1918. When surface disturbance must be created during the migratory avian breeding season (March 1 through August 31) a survey performed by a qualified biologist following BLM survey protocols would be conducted for active nests. This survey would be conducted no more than ten days prior to and no less than three days prior to proposed disturbance activities. The results of the survey would be reported to the BLM biologist prior to any surface disturbance activity. If active nests are located or reproductive behaviors observed, disturbance activities may be postponed, a protective buffer may be established, or other appropriate protective measures would be instituted to avoid disturbance to the nest or reproductive behaviors until the nests are no longer active. The start and end dates of the seasonal restriction may be based upon site-specific information such as species affected, elevation, and weather patterns which may affect breeding chronology.

Light plants would be stored with the masts in a lowered position when not in use to reduce potential predatory bird perching sites.

Special Status Species

If dark kangaroo mouse and/or Preble's shrew habitat is disturbed, FCMI would reseed the disturbed areas with a BLM-approved seed mix. Light plants would be stored with the masts in a lowered position when not in use to reduce potential predatory bird perching sites.

Wildlife

The mining plan has been developed with a minimal disturbance footprint. FCMI would train operators to observe the Project Area for the presence of larger wildlife such as mule deer and pronghorn antelope as well as avian and other terrestrial wildlife. FCMI would continue to operate in accordance with established FCMI wildlife protection policies that prohibit feeding or harassment of wildlife.

Trash and other waste products would be properly managed, and FCMI would control garbage that could attract wildlife. Appropriate speeds (25 miles per hour or less) would be maintained along access and service roads. These environmental protection measures are intended to reduce the immediate and long-term impacts that mining could potentially have on wildlife.

Light plants would be stored with the masts lowered when not in use to eliminate potential predatory bird perching sites.

Protection of Survey Monuments

To the extent practicable, FCMI would protect all survey monuments, witness corners, reference monuments, against unnecessary or undue destruction or damage. If, in the course of operations, any monuments, corners, or accessories are destroyed, FCMI would immediately report the matter to the BLM Authorized Officer. Prior to destruction or damage during surface disturbing activities, FCMI would contact the BLM to develop a plan for necessary restoration or re-establishment activity of the affected monument in accordance with Nevada Instruction Memorandum (IM) No. NV-2007-003 and Nevada law. FCMI would bear the cost for the restoration or re-establishment activities including the fees for a Nevada professional land surveyor.

Public Safety, Access, and Signage

Public safety would be maintained throughout the duration of the Project. Active mining areas would have earthen berms constructed five feet high approximately 30 feet from the pit edge. Security gates would remain in place around the mine site. The frontage road provides access to FCMI facilities via access and haul roads, as well as access to a communication facility, including the office/first-aid trailer, parking, ready line area located in Section 12 of T31N, R33E. Several existing named public roads (issued as Pershing County ROWs in BLM records) in and around the Project Area include Antelope Canyon Road, Black Canyon Road, Foothill Road, Humboldt Canyon Road, and Johnson Canyon Road. Appropriate signage would also be installed at these locations, notifying the public of an active mining operation and access restrictions.

Land Use Authorizations

The Proposed Action would be carried out to avoid impacts to existing ROWs adjacent to the Project Area. The ROWs consist of buried fiber optic cables, Interstate 80, pipelines, transmission lines, communication sites, aerial transmission lines/switching stations, access roads, and county roads. The owners of each ROW are shown in **Table 3-14**. FCMI would obtain the necessary permits for access road improvements within the NDOT ROW N-056389.

Prevention and Control of Fires

FCMI recognizes that the BLM maintains jurisdictional authority to suppress vegetation fires occurring on the BLM-administered land within the Project Area. Fires occurring within the active mine site would be coordinated with FCMI for appropriate suppression response, though the BLM would respond to all reported fires occurring on the BLM-administered land within the Project Area.

FCMI would take prudent measures to prevent and suppress fires occurring from their activities, and they would also report all fires as described below.

- Personnel would be allowed to smoke only in designated areas;
- Vehicles would carry at a minimum a shovel and five gallons of water (preferably in a backpack pump), in addition to a conventional fire extinguisher;
- Adequate firefighting equipment (a shovel, a pulaski, standard fire extinguisher(s), and an ample water supply) would be kept readily available at each active drill site;
- Vehicle catalytic converters would be inspected often and cleaned of all flammable debris;

- All cutting/welding torch use, electric-arc welding, and grinding operations would be conducted in an area free, or mostly free, from vegetation. An ample water supply and shovel would be on hand to extinguish any fires created from sparks. At least one person in addition to the cutter/welder/grinder would be at the work site to promptly detect fires created by sparks;
- Any fire restrictions or closures issued by the BLM Winnemucca District Office would be publicized in the local media, and notice would be posted at various sites throughout the district. The BLM does not individually contact operators. This Plan of Operations serves as an authorization that may exempt FCMI's operations from certain restrictions in those orders. Personnel would be responsible for being aware of and complying with the requirements of those orders; and
- Any wildland fire observed would be reported immediately to the BLM Central Nevada Interagency Dispatch Center at (775) 623-3444.

Measures to be Taken during Temporary, Interim, or Seasonal Closures

FCMI does not anticipate planned extended inactive periods. The rate of mining may vary depending on market conditions and contract agreements with FCMI. The handling, management and hauling of the ore from the site could occur at any time during a 24-hour day, 365 days per year. Site inspections for BMP maintenance and monitoring would occur regularly.

FCMI has prepared a Temporary Closure Plan in compliance with 43 CFR 3809.401(b)(2)(vi) and submitted in the Operating Plan as Appendix E of the WPC Permit (ASWT 2014).

Should a temporary, interim, or seasonal closure occur, the following measures would be implemented to maintain site safety and stability. These measures are discussed in greater detail in the Interim and Seasonal Closure Plan:

- Security: The Project Area would have appropriate signage at the frontage road, exit from Interstate 180, office/first-aid trailer, parking, ready line area, and open pit areas;
- Supplies: Most supplies or equipment maintenance products would not remain on-site. Miscellaneous equipment, if remaining on-site, would be stored in the fenced and locked office/first-aid trailer, parking, and ready line area.;
- Contractor Equipment: Contractor equipment would be removed;
- Roads: The main access road would receive maintenance, as necessary;
- Mine Open Pits: Berms around the pits would remain in place, and public access would be restricted;
- Noxious Weed Control: FCMI would continue to monitor and control noxious weeds and non-native invasive species.
- Erosion Control Measures: Storm water and erosion control structures would be regularly inspected and maintained;
- Buildings and Equipment: The office/first-aid trailer and FCMI equipment or support facilities left on-site would be protected from public access, would be kept within the parking and ready-line area, and maintained as necessary; and
- Monitoring and Maintenance: FCMI personnel would staff the site as necessary and perform monitoring, security, and necessary maintenance.

No temporary, interim, or seasonal closures of the facility are planned. However, it is possible that, due to mechanical or technical difficulties, unfavorable economic conditions, litigation, or

other unforeseen events, mining and/or hauling of ore may have to be temporarily closed. Under this scenario, the BLM and NDEP would be notified within 30 days of the temporary closure.

Drill Hole Plugging and Well Abandonment

Mineral exploration and development drill holes subject to NDWR regulations would be abandoned in accordance with applicable rules and regulations (NAC Chapter 534). Boreholes would be sealed to prevent cross contamination between aquifers, and the required shallow seal would be placed to prevent contamination by surface access.

Monitoring and production wells would be abandoned and reclaimed as required by NAC 534. Well abandonment methods would differ based on well hydrologic conditions (e.g. dry, standing water or artesian) and completion methods (e.g. type of casing- polyvinyl chloride or steel, perforated interval, unperforated, etc.).

Existing Groundwater Monitoring Wells

The existing groundwater monitoring well (MW) network (MW-7, MW-8, MW-11 through MW-17) is sampled on a quarterly basis for the NDEP Profile I parameters. The Cooling Pond and production wells (PW) (PW-1 through PW-7) are sampled annually and reported to the NDEP. PW-5 is the potable water supply for the Florida Canyon Mine. Groundwater from this well is sampled quarterly and reported to the Nevada Bureau of Safe Drinking Water. Groundwater levels are monitored on a monthly basis as required by the Nevada Department of Water Resources.

Process Solutions

The barren and pregnant leach solutions would be sampled semi-annually and analyzed for NDEP Profile II parameters. These samples would be collected in the plant and data reported semi-annually.

Leak Detection and Recovery

All leak detection sites would be checked weekly. If an accumulation of liquid appears, action would be taken to determine the source and make repairs. Data would be reported on a quarterly basis to the NDEP.

Rock Characterization

Waste rock and ore samples would be collected as required in accordance with the WPC Permit during active mining operations. The number of samples collected depends on the number of working faces exposed during a quarter. A minimum of one of each (one waste and one ore) to a maximum of 16 of each would be collected and analyzed on a quarterly basis. Samples would be analyzed using the meteoric water mobility procedure (MWMP) according to the NDEP's BMRR standards. In addition, the samples would be analyzed for acid-base accounting (static tests) by the modified Sobek method. Static test data would be reported to the NDEP and BLM quarterly. If static test results exceed the NDEP and BLM criteria, then kinetic testing (humidity cells tests) would be performed. Kinetic test results are also provided to the NDEP and BLM.

Post-Reclamation Monitoring and Maintenance

Post-reclamation monitoring and maintenance would include qualitative monitoring of key stability indicators which may include vegetation, surface erosion, sedimentation, and slope

stability parameters. Appropriate maintenance activities would be implemented as needed. Maintenance activities may include one or more of the following:

- Sediment removal from storm water drainage channels and diversion as necessary to maintain their design capacity;
- The function of temporary erosion control BMPs such as silt fences and straw bales would be maintained. These BMPs would be removed when no longer essential for erosion control;
- Diverting surface water away from reclaimed areas where erosion jeopardizes attainment of reclamation standards;
- Stabilization of rills, gullies, other erosion features or slope failures through placement or riprap, mulch, diversions, and sediment control structures;
- Noxious weed control; and
- Reseeding or re-application of reclamation treatments would occur in areas where determined through monitoring and agency consultation that reclamation has not yet met reclamation standards.

Quantitative reclamation monitoring to measure compliance with the re-vegetation success criteria would begin during the first growing season after final reclamation has been completed and would continue for a minimum of three years or until the reclamation success criteria are achieved. Qualitative monitoring of key indicators of site stability would continue, and the reclamation performance management guidelines would apply during this time. The bond release criteria would be applied to the data collected in the third year following reclamation. Re-vegetation success would be determined based on the BLM and NDEP Nevada guidelines for successful re-vegetation (NDEP 1998).

2.2 RECLAMATION OF EXISTING AND PROPOSED FACILITIES

Previous Reclamation Plans have been prepared in support of prior Amendments to the Plan of Operations. The following section describes the proposed measures to reclaim the disturbance areas associated with the Proposed Action. Reclamation activities would be implemented to meet post-closure land use following completion of proposed mining and processing operations. The proposed reclamation plan was developed in accordance with the following goals:

- Provide for public safety;
- Ensure no degradation of State Waters occurs as a result of FCMI's mining activities;
- Establish a self-sustaining plant community to stabilize reclaimed sites and meeting post-mining land use; and
- Return the mine site to beneficial post-mining land use.

Upon completion of mining operations associated with the Proposed Action, all project facilities including waste rock storage facilities, heap leach pads, and haul roads would be reclaimed according to procedures outlined in this plan. Short-term reclamation goals include stabilization of disturbed areas and protection of adjacent undisturbed areas from unnecessary or undue degradation. The proposed post-reclamation topography associated with the Proposed Action is presented on **Figure 2-6**.

2.2.1 Reclamation Schedule

Reclamation activities would be initiated once mine facilities or disturbance areas are no longer required for mining operations. FCMI would continue to perform concurrent reclamation throughout the operation phase of the Proposed Action including grading, placement of growth media, and seeding. FCMI proposes to conduct reclamation activities in two phases: initial reclamation following cessation of mining activities, presented in **Table 2-4,** and reclamation activities following the proposed post-closure monitoring period, presented in **Table 2-5**.

TABLE 2-4 Proposed Initial Reclamation Schedule

Task #	Task	Starting Quarter	Time
1	Initial Reclamation Schedule	1	19 Months
2	Contractor Contract Setup and Mobilization	1	15 Days
3	Design Changes	1	90 Days
4	Process Solution Management	1	15 months/450 Days
5	Interim Fluid Management	1	180 Days
6	Phase 1 Recirculation	2	60 Days
7	Phase 2 Active Evaporation	3	180 days
8	Phase 3 Transition to Passive Evaporation	5	30 Days
9	E Cell Construction	5	30 Days
10	Earthworks/ Recontouring/ Revegetation	1	540 days/ 18 Months
11	Waste Rock Storage Facility	1	114 Days
12	Waste Rock Regrading	1	40 Days
13	Waste Rock Growth Media/ Revegetation	1	74 Days
14	Pits	2	20 Days
15	Pit Berms	2	15 Days
16	Pit Backfill	2	5 Days
17	Heap Leach Pad Phase 1	6	54 Days
18	Heap Leach Regarding	6	6 Days
19	Heap Leach Cover Placement and Seeding	6	48 Days
20	Yards	3	5 Days
21	Foundations and buildings	4	5 Days
22	Generic Material Hauling	4	5 Days
23	Fence and Power Line Removal	4	14 Days
24	Borrow Source and Ancillary Disturbance Regrading/ Seeding	6	30 Days
25	Road Reclamation	6	18 Days
26	Contractor Demobilization	6	7 Days

TABLE 2-5 Proposed Post Closure Monitoring Reclamation Schedule

Task #	Task	Starting Year	Time
1	Initial Reclamation Schedule	1	1.5 Years
2	Post Closure Reclamation Schedule	2	20 Years
3	Contractor Mobilization	22	0.5 Weeks
4	Well Abandonment	22	2.5 Weeks
5	Contractor Demobilization	22	0.5 Weeks

2.2.2 Growth Media and Cover Material

Soil types in the project boundary were evaluated to determine suitability, depth of salvage, and use as a growth media or cover for reclamation purposes. **Table 2-6** summarizes the estimated volume of growth media, ET cover soil, and E-Cell media required for reclamation of the mine facilities associated with the Proposed Action. Soil replacement depth would vary according to the mine component.

TABLE 2-6 Estimated Volume of Cover Material

Proposed Facility	Material Type	Source	Minimum Depth (ft.)	Volume Required (yd^3)	Volume Available (yd^3)
SHLP – Phase 1	ET Cover	North Borrow Source	2	345,753	357,000
SHLP – Phase 1, 2 and 3	ET Cover	South Borrow Source	2	1,015,526	1,097,000
SWRSF	Growth Media	SWRSF Stockpile	1	515,063	520,000
Phase 7 Pit Bottom	Growth Media	Pit Bottom Stockpile	1	69,360	72,000
Carbon Columns	Growth Media	North Borrow Source	3	733	357,000
Crusher	Growth Media	North Borrow Source	3	139	357,000
Evaporative Cells	Evaporative Media	E-Cell Stockpile	2	35,804	36,000

Source: ASWT 2013d

Graded surfaces would be ripped where necessary prior to placement of growth media. Ripping would reduce compaction and provide a uniform seed bed.

2.2.3 Phase 7 Pit

It has been requested that the Phase 7 Pit slopes be exempt from reclamation pursuant with NAC 519A.250. FCMI would restrict access to the mine pit by posting warning signs around the pit perimeter. Roads leading to the pit would be blocked with large rock or earth barriers and berms would be constructed around the perimeter of the pit to prevent access to motorized vehicles. Five foot high berms would be constructed 30 feet from the edge of the final pit crest to prevent failure of the berm with natural highwall sloughing. Upon completion of mining operations, the pit bottom would be scarified, capped with a one foot cover of growth media, and seeded with a BLM-approved seed mix. Growth media would not be placed on highwalls or benches of the open pit. The slope along the southwestern pit perimeter would be graded to an overall 3H: 1V slope. The pit would not be backfilled.

2.2.4 SWRSF Expansion

As discussed in Chapter 2.1.3, the proposed SWRSF Expansion would be constructed in successive benches with 85 ft. setbacks between each bench allowing for final recontouring to achieve overall 3H: 1V reclamation slopes. Recontouring of the proposed SWRSF would minimize erosion of the side slopes and prevent meteoric water from ponding on the surface of the facility. The proposed final slope configuration would meet proposed post-closure land use

of livestock grazing and wildlife habitat. Slopes would be seeded using a BLM-approved seed mix to allow for re-establishment of a sustainable vegetation community.

Controlling Run-off and Diverting Run-on

FCMI proposes to leave the contact water and non-contact water channels in place during and after the reclamation phase. Surface water run-on (non-contact water) would continue to be diverted away from the reclaimed facilities to avoid potential impact to surface water. Contact water (run-off) would be collected and diverted to the proposed Sediment Pond 9. Any surface disturbance adjacent to the channels would be scarified and seeded for reclamation.

2.2.5 SHLP Facility

At the end of mining operations, the SHLP would have an ultimate height of approximately 200 ft. and contain approximately 15.9 million yd^3 of spent ore material. SHLP reclamation components include:

- Heap contouring;
- Heap solution disposal by enhanced evaporation;
- Installation of an ET cover soil/growth media application;
- Draindown solution management and passive evaporation;
- Seeding; and
- Post-reclamation monitoring.

The proposed SHLP would be graded to achieve overall slopes of 3H: 1V to minimize solution and storm water infiltration, and promote long-term stability.

The reclamation plan for the proposed SHLP would consist of a zero-discharge scenario including an enhanced evaporation and pump back system in the proposed solution ponds (when draindown flows are high), followed by passive evaporation in the ponds. Enhanced evaporation would be achieved through installation of four pairs of turbo misters on top of the SHLP Phase 1 (ASWT 2013a).

When active pump back is no longer required to manage process solutions, the heap would be covered with a minimum two feet of alluvial material from designated borrow sources to serve as an ET cover that would limit infiltration of precipitation (ASWT 2013a).

At a point where draindown flow rates reach E-Cell design rates (2.15 gpm/acre or 23.87 gpm for the proposed E-Cells) passive evaporation would commence and the proposed solution ponds would be converted to E-Cells. **Table 2-7** summarizes anticipated time duration and flow rates for each phases of the draindown of Phase 1 of the proposed SHLP.

TABLE 2-7 Predicted Flow Rates at Draindown – Phase 1 SHLP

Phase of Draindown	Initial Flow Rate (gpm)	Final Flow Rate (gpm)	Time Period
Phase 1 - Recirculation	5,003	252	January-March of Year 1
Phase 2 – Active Evaporation	385	37	April-October of Year 1
Phase 3 – Transition to Passive Evaporation	37	33	November of Year 1

Source: ASWT 2013d

Surface piping and exposed conduits would be buried or removed as necessary. If removal of the pipe network is necessary, appropriate rinsing and disposal would be conducted as prescribed by NDEP and BLM. The liner and drain pipes would be left in place under the heap leach pad. The surface of the proposed SHLP would be scarified and seeded with a BLM-approved seed mix. Perimeter berms and ditches would be left in place, covered with growth media, and seeded during final reclamation.

2.2.6 Roads

Reclamation of roads would commence at the earliest time following cessation of mining activities. Road surfaces would be ripped with a dozer to reduce compaction and promote establishment of vegetation. The graded surface would be contoured to blend with the surrounding topography, and seeded with a BLM-approved seed mix. Road access required for post-closure monitoring activities would be maintained.

All culverts would be removed or buried utilizing BMPs to restore natural drainage patterns.

2.2.7 Stabilizing Drainage Areas or Streambeds

Grading would be performed to minimize surface water flow concentration. Streambeds and drainage areas would be graded to re-establish surface water flow and reduce concentrated flow in reclaimed areas.

2.2.8 Buildings and Ancillary Facilities

With the exception of the South Crusher facility, all buildings and facilities used during the mining and ore processing associated with the Proposed Action would be reclaimed in accordance with previously approved permits. The South Crusher facility concrete foundations would be broken and buried in place, or simply buried in place. A minimum of three ft. of cover material would be placed over broken foundations and five ft. of growth media would cap unbroken foundations left in place. Safety berms, fences, and signs would be monitored annually for a period of four years to maintain consistency with the approved Standardized Reclamation Cost Estimator (SRCE) for existing facilities. The barbed wire fence installed in the proposed south area perimeter would be removed.

2.2.9 Borrow Areas

Borrow source surface areas would be graded and seeded. Final topography for the borrow areas is depicted on **Figure 2-6**.

2.2.10 Post-Closure Monitoring

Post-closure monitoring would be performed in compliance with the current WPC Permit for the site. A post-closure fluid management system would be prepared to refine the appropriate fluid management and monitoring requirements at the time of closure. Surface water monitoring would continue until vegetation is established and/or until monitoring is determined by NDEP and BLM to no longer be necessary. As the mine life comes to an end, FCMI would prepare a Final Permanent Closure plan including post-closure monitoring in accordance with State of Nevada requirements. Should monitoring reveal that any systems designed to protect the environment are not functioning properly or that the vegetation is not established at a satisfactory level, corrective action would be performed.

Should temporary cessation of mining and ore processing operations occur in response to unfavorable economic conditions or climatic events that exceed engineered design for facilities, FCMI would prepare and submit to appropriate state and federal agencies a Temporary Closure Plan. Activities that are anticipated to be maintained during a temporary cessation of operations include the following:

- Implementing dust management practices to prevent unnecessary or undue degradation, including:
    - Watering of roads;
    - Application of dust suppressant materials, as needed; and
    - Following posted speed limits.
- Maintain and operate the pond pumps and plants to recirculate solution until the amount of solution in the system is reduced to a level that can be maintained without pumping;
- Environmental monitoring as prescribed under all applicable permits (local, state, and federal);
- Continued operation of the groundwater contamination mitigation pumpback system;
- Retain a workforce of three staff and the equipment needed to meet security, operational, dust control and monitoring requirements and to react to emergencies resulting from storm events or other unplanned occurrences to ensure that unnecessary or undue degradation does not occur. It is anticipated that two staff members would be on-site at Florida Canyon Mine to meet operational requirements and comply with permit requirements and one additional staff member would handle the dust control and security; and
- Maintain an adequate financial guarantee.

2.3 ACTION ALTERNATIVES

NEPA requires that a reasonable range of alternatives to the Proposed Action be considered that could feasibly meet the objectives of the Proposed Action as defined in the purpose and need for the Project (40 CFR 1502.14(a)). The range of alternatives required is governed by a "rule of reason" (i.e., only those feasible alternatives necessary to permit a reasoned choice need be considered). Reasonable alternatives are those that are practical or feasible based on technical and economic considerations [46 Federal Register 18026 (March 23, 1981), as amended; 51 Federal Register 15618 (April 25, 1986)].

Alternatives to the Proposed Action must be considered and assessed whenever there are unresolved conflicts involving alternative uses of available resources (BLM NEPA Handbook H-1790-1, page IV-3 (BLM 2008a)).

2.3.1 No Action

Under the No Action alternative the previously approved actions within the APO #18 boundary would continue for a period of approximately three years, dependent on metal prices, before commencing reclamation. The effects of the No Action on the environment are explained in the following chapters. In the previously approved plan, the existing pad would continue to operate through re-circulating process solution to the pad and to the process facility. All existing features would be removed and/or reclaimed, and revegetated as per BLM and NDEP requirements.

2.3.2 Alternative Considered but not Analyzed in Detail – Rebuilding Existing Heap Leach Pad

Under this alternative, FCMI would be required to construct the entire proposed SHLP. Ore from the existing leach pad would be off loaded and transported to the new SHLP. This ore would be agglomerated and then cyanide leached as normal. The existing leach pad would then be decommissioned and rebuilt; new HDPE geomembrane would be overlain on a new compacted soil layer and equipped with leak detection. Excavation of the proposed Phase 7 Pit would commence and the ore would be placed on the rebuilt leach pad. New ore would be cyanide leached as normal. Waste rock from the proposed Phase 7 Pit would be placed on the expanded SWRSF.

This alternative has been considered but not analyzed in detail. This alternative would increase the size of the proposed heap leach pad by approximately 241.5 acres, resulting in increased surface area disturbance. An advantage to this alternative is the existing leach pad would be rebuilt/replaced and equipped with updated leak detection.

The current technology is feasible for this alternative. What is not preferred about this alternative is that it would create a larger disturbance and the economic value from reprocessing the ore is not present at $1300/oz. for gold.

2.4 LAND USE CONFORMANCE STATEMENT

The Proposed Action described in this EA is in conformance with the Sonoma-Gerlach Management Framework Plan (BLM 1982) which states that BLM should "make no land use decisions that would interfere with the potential development of economically important minerals occurring on public lands or other federally owned minerals within mining districts or other areas outside of designated mining districts". The No Action Alternative is in conformance with the Sonoma-Gerlach Management Framework Plan (BLM 1982).

2.5 RELATIONSHIP TO LAWS, REGULATIONS, AND OTHER PLANS

2.5.1 Federal Requirements

In order to use public land managed by the BLM Winnemucca District Office, FCMI must comply with BLM Surface Management Regulations 43 CFR 3809, the Mining and Mineral Policy Act of 1970 (as amended), and the FLPMA. BLM reviews the Proposed Action to ensure the following:

- Adequate provisions are included in the Proposed Action to prevent unnecessary or undue degradation of public land and to protect non-mineral resources;
- Measures are included in the Proposed Action to provide for reclamation of disturbed areas; and
- Compliance with applicable state and federal laws is achieved.

2.5.2 Other Federal, State, and Local Land Use Plans and Policies

This EA has been prepared in accordance with the following statutes and implementing regulations, policies, procedures and plans to the maximum extent consistent with federal law and FLPMA provisions:

- Disposal of Solid Waste (NRS 444.440-444.465; NAC 444.570-444.7499);
- Facilities for Management of Hazardous Waste (NRS 459.400-459.600; NAC 444.965-444.976);
- Water Quality Standards (NRS 444A.420; NRS 445A.118-445A.2234);
- Water Pollution Control (NRS 445A-All; NAC 445A-All);
- Mining Facilities (NRS 445A.300-445A.730; NAC 445A.350-445A.447);
- Air Pollution Control (NRS 445B.100-445B.640; NAC 445B.001-445B.395); and
- Mining Regulation and Reclamation (NRS 519A.010-519A.240 and 519A.260-519A.280; NAC 519A.010-519A.415).
- Resource Conservation and Recovery Act (Subtitle C, Small Quantity Generator)
- Clean Water Act (33 U.S.C. §1251 et seq. (1972))
- The Pershing County Master Plan

The State of Nevada policy concerning mining and reclamation is defined in NAC 519A.010 as follows:

- The extraction of minerals by mining is a basic and essential activity making an important contribution to the economy of the State of Nevada;
- Proper reclamation of mined land, areas of exploration, and former areas of mining or exploration is necessary to prevent undesirable land and surface water conditions detrimental to the ecology and to the general health, welfare, safety and property rights of the residents of the state; and
- The success of reclamation efforts in this state is dependent upon cooperation among state and federal agencies.

The Proposed Action is consistent with state policies.

3.0 THE AFFECTED ENVIRONMENT

The BLM is required to consider specific elements of the human environment that are subject to requirements specified in statute or regulation or by executive order. **Table 3-1** below outlines the Supplemental Authority elements that must be considered in all environmental analyses, as well as additional resources deemed necessary for evaluation by the BLM.

TABLE 3-1 Supplemental Authority Elements

Supplemental Authorities	Not Present[1]	Present/ Not Affected	Present/May Be Affected[2]	Comments/ Rationale
Air Quality			X	See Chapters 3.1 and 4.1
Area of Critical Environmental Concern (ACEC's)	X			The Project Area is not in a designated ACEC. The purpose and need of this EA is not to evaluate the Project Area's potential to be an ACEC. ACEC's are nominated during the resource management planning process per 43 CFR 1610.7-2.
Cultural Resources			X	See Chapters 3.2 and 4.2
Environmental Justice		X		See Chapters 3.3 and 4.3
Floodplains	X			Resource is not present.
Invasive, Nonnative Species			X	See Chapters 3.4 and 4.4
Migratory Birds			X	See Chapters 3.5 and 4.5
Native American Religious Concerns			X	See Chapters 3.6 and 4.6
Prime or Unique Farmlands	X			Resource is not present.
Threatened and Endangered Species	X			Resource is not present.
Waste, Hazardous or Solid		X		See Chapters 3.7
Water Quality (Surface and Ground)			X	See Chapters 3.8 and 4.7
Wetlands and Riparian Zones	X			Resource is not present.
Wild and Scenic Rivers	X			Resource is not present.
Wilderness	X			Resource is not present.

[1] A Supplemental Authority element determined to be Not Present need not be carried forward or discussed further in the EA.
[2] A Supplemental Authority element determined to be Present/May Be Affected must be carried forward in the EA.

Other elements or additional 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				
Other Resources	**Not Present[1]**	**Present/ Not Affected**	**Present/ May Be Affected[2]**	**Comments/ Rationale**
Economics and Social Values			X	See Chapter 3.9 and 4.8
Historic Trails			X	See Chapter 3.10 and 4.9
Lands with Wilderness Characteristics	X			The Project Area is not a designated Lands with Wilderness Characteristics area. The assessment area does not meet the naturalness, solitude or primitive and unconfined recreation criteria to contain wilderness characteristics.
Noise		X		See Chapter 3.11 and 4.10
Paleontology			X	See Chapter 3.12 and 4.11
Public Access			X	See Chapter 3.13 and 4.12
Rangeland Management		X		See Chapter 3.14 and 4.13
Realty		X		See Chapter 3.15
Recreation		X		See Chapter 3.16
Soils			X	See Chapter 3.17 and 4.14
Special Status Species			X	See Chapter 3.18 and 4.15
Vegetation			X	See Chapter 3.19 and 4.16
Visual Resources			X	See Chapter 3.20 and 4.17
Water Quantity		X		See Chapter 3.21
Wildlife			X	See Chapter 3.22 and 4.18

[1] An Additional Resource element determined to be Not Present need not be carried forward or discussed further in the EA.
[2] An Additional Resource element determined to be Present/May Be Affected must be carried forward in the EA.

Each supplemental authority affecting the proposed Project Area as a result of the Proposed Action is discussed in detail within the following sections. The information presented is a combination of data accumulated from field investigations and collaboration with BLM.

3.1 AIR QUALITY

3.1.1 Regulatory Framework

Ambient air quality and the emission of air pollutants are regulated under both federal and state laws and regulations. The Federal Clean Air Act (FCAA), and the subsequent Clean Air Act Amendments of 1990 (CAAA), require the United States (U.S.) Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. The FCAA and the CAAA establish NAAQS for six pollutants, known as criteria pollutants because the ambient standards set for these pollutants satisfy the human health-based and/or environmentally based criteria (scientific based guidelines) specified in the FCAA. The criteria pollutants and their currently applicable NAAQS set by the EPA are listed in **Table 3-3**.

The most recent revisions include amendments to standards for the following pollutants (dates represent publication in the Federal Register [FR]): particulate matter less than ten microns (PM_{10}) and less than 2.5 microns ($PM_{2.5}$) (EPA 2013); ozone (O_3) (EPA 2008a); lead (Pb) (EPA 2008b); nitrogen dioxide (NO_2) (EPA 2010a); sulfur dioxide (SO_2) (EPA 2010b); and carbon monoxide (CO) (EPA 2011b). All updated standards are effective in all states on the "effective" dates noted in the FR.

TABLE 3-3 National Ambient Air Quality Standards for Criteria Pollutants *

Pollutant [final rule cite]		Standards (Primary/Secondary)	Averaging Time	Level[1]
Carbon Monoxide (CO) [76 FR 54294, Aug 31, 2011]		primary	8-hour	9 ppm (10 mg/m^3)
			1-hour	35 ppm (40 mg/m^3)
Lead (Pb) [73 FR 66964, Nov 12, 2008]		primary and secondary	Rolling 3-month average	0.15 µg/m^3
Nitrogen Dioxide (NO_2) [75 FR 6474, Feb 9, 2010]		primary	1-hour	100 ppb (188 µg/m^3)
		primary and secondary	Annual	53 ppb (100 µg/m^3)
Ozone (O_3) [73 FR 16436, Mar 27, 2008]		primary and secondary	8-hour	0.075 ppm (150 µg/m^3)
Particulate Matter [Dec 14, 2012]	$PM_{2.5}$	primary	Annual	12 µg/m^3
		secondary	Annual	15 µg/m^3
		primary and secondary	24-hour	35 µg/m^3
	PM_{10}	primary and secondary	24-hour	150 µg/m^3
Sulfur Dioxide (SO_2) [75 FR 35520, Jun 22, 2010]		primary	1-hour	75 ppb (196 µg/m^3)
		secondary	3-hour	0.5 ppm (1,300 µg/m^3)

*as of January 2014 (EPA 2014)

[1]milligrams per cubic meter (mg/m^3); micrograms per cubic meter (µg/m^3); parts per million (ppm); and parts per billion (ppb)

The attainment status with the NAAQS is achieved when the existing background concentrations for criteria air pollutants are less than the minimum allowable ambient concentrations defined in the NAAQS.

NAC 445B.22097 sets the Nevada State Ambient Air Quality Standards (NSAAQS). These standards of quality for ambient air are minimum goals, and are intended to protect the existing quality of Nevada's air to the extent that is economically and technically feasible. The criteria pollutants and their currently applicable Nevada Standards are listed in **Table 3-4**.

TABLE 3-4 Nevada Ambient Air Quality Standards for Criteria Pollutants			
Pollutant		**Averaging Time**	**Level**
Carbon Monoxide (CO)	Less than 5,000 ft. above mean sea level	8-hour	9 ppm (10,500 µg/m^3)
	At or greater than 5,000 ft. above mean sea level		6 ppm (7,000 µg/m^3)
	At any elevation	1-hour	35 ppm (40,500 µg/m^3)
Lead (Pb)		Quarterly arithmetic mean	0.15 µg/m^3
Nitrogen Dioxide (NO_2)		Annual arithmetic mean	0.053 ppm (100 µg/m^3)
Ozone (O_3)		1-hour	0.12 ppm (235 µg/m^3)
Ozone (O_3)	Lake Tahoe Basin, #90	1-hour	0.10 ppm (195 µg/m^3)
Particulate Matter as PM_{10}		Annual arithmetic mean	50 µg/m^3
		24-hour	150 µg/m^3
Sulfur Dioxide (SO_2)		Annual arithmetic mean	0.030 ppm (80 µg/m^3)
		24-hour	0.14 ppm (365 µg/m^3)
		3-hour	0.5 ppm (1,300 µg/m^3)
Hydrogen Sulfide (H_2S)		1-hour	0.08 ppm (112 µg/m^3)

The Project Area is within the Humboldt River Air Basin, which is designated as unclassified. The attainment status with respect to the applicable air quality standards (NAAQS and NSAAQS) for the Proposed Action is presumed to be in attainment (Enviroscientists 2013).

Specific types of facilities that emit, or have the potential to emit, 100 tons per year (tpy) or more of criteria air pollutants, 10 tpy or more of a single hazardous air pollutant (HAP), or 25 tpy or more of combined HAP, or any facility that emits, or has the potential to emit, 250 tpy or more of criteria air pollutants, is considered a major stationary source under the Federal Prevention of Significant Deterioration (PSD) regulation. Most fugitive emissions are not counted as part of the calculation of emissions for PSD. Major stationary sources are required to notify federal land managers of Class I planning areas within 100 kilometers of the major stationary source. No Class I planning areas are located within 100 kilometers of the Project Area. The Project-related air pollutant emission sources under the Proposed Action are minor stationary sources not subject to PSD regulatory requirements (Enviroscientists, 2013).

On February 17, 2011, the EPA added the gold mine ore processing and production area source category to the list of source categories to be regulated under Section 112(c)(6) of the FCAA promulgating the National Emission Standards for Hazardous Air Pollutants (NESHAP) to regulate mercury (Hg) emissions from this source category. Gold mine ore processing and production facility means any industrial facility engaged in the processing of gold mine ore that uses any of the following processes: roasting operations; autoclaves; carbon kilns; pregnant tanks; electrowinning; Hg retorts; or melt furnaces. Operations at Florida Canyon Mine include two Hg retorts, a tilting crucible furnace, and a carbon regeneration kiln. Therefore, the Project is now subject to the Federal Operating Permit Program (Title V) for Hg emitting units.

NDEP- BAPC is responsible for permit and enforcement activities throughout the State of Nevada (excluding Washoe and Clark Counties). The Project Area is located in Pershing County, Nevada. Before any construction of a potential source of air pollution can occur, an air quality permit must be obtained from the BAPC. The BAPC permitting program implements the Title V

federal operating permitting program, as well as the new source review (minor and major) permitting program and the surface area disturbance program.

The BAPC is also responsible for the Mercury Control Program (MCP) effective since May 4, 2006. The MCP is designed to control Hg emissions from thermal units located at precious metal mines and mills. In the initial phase of the MCP, data on thermal units and their controls were collected throughout Nevada. This is being followed by the development of Nevada Maximum Achievable Control Technology (NVMACT) standards for each type of thermal unit. The installation of NVMACT control devices, incorporation of work practice standards, establishment of reporting and recordkeeping, and Hg emission limits is required under the MCP. Mining facilities can request smaller emitting thermal units that would emit less than a total of five pounds per year of Hg per source, to have a *de minimis* designation. The Florida Canyon Mine includes thermal units such as a furnace, carbon regeneration kiln and retorts which emit Hg and are subject to NVMACT.

As defined by the EPA, greenhouse gases (GHGs) include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases. Combustion of fossil fuels results in emissions of GHGs. Ongoing scientific research has identified the GHG emissions and changes in biological carbon sequestration due to land management activities are believed to have contributed to the global climate change. On September 22, 2009, EPA issued a GHG Reporting Rule that requires suppliers of fossil fuels, manufacturers of vehicles and engines, and industrial facilities that emit 25,000 metric tons or more of carbon dioxide equivalent (CO_2e) to submit annual reports to the EPA.

3.1.2 Assessment Area

The Proposed Action would occur in the Humboldt River Air Basin, Imlay Area 72. The cumulative air analysis study area, as presented on **Figure 3-1**, is located in a high desert environment characterized by arid to semiarid conditions with a high percentage of cloud-free days, low annual precipitation, and large daily ranges in temperatures. The weather is controlled primarily by rugged and varied topography to the west, and specifically the Sierra Nevada Range. Prevailing westerly wind moves warm, moist Pacific air over the western slopes of the Sierra Nevada Range where the air cools, condensation takes place, and most of the moisture falls as precipitation. As the air descends the eastern slopes of the Sierra Nevada Range, compressional warming takes place, resulting in minimal rainfall.

Based on meteorological data collected from the National Weather Service station at Lovelock, Nevada, during 2006 to 2010, the average minimum temperature was 35.5 degrees (°) Fahrenheit (F) and the average maximum temperature was 67.0 °F. The average annual precipitation during the same period was 6.17 inches.

3.1.3 Existing Environment

Air quality in the Project Area is governed by both factors of pollutant emissions and meteorological conditions. The Project Area is located within an Air Quality Management Area that is currently in attainment-unclassifiable for all pollutants having an air quality standard (40 CFR 81.329). No CO, NO_2, SO_2, or Pb non-attainment areas are located within that portion of the State of Nevada regulated by the BAPC. Washoe County, Nevada (which includes the city of Reno) is the PM_{10} non-attainment area located closest to the Project Area, although it is located more than 100 miles (167 kilometers) to the southwest.

At present, the BAPC does not conduct ambient air quality monitoring in the vicinity of the Florida Canyon Mine. The closest Nevada Air Pollution Control Program monitoring stations are located in Elko (PM_{10}), Fernley (PM_{10}, $PM_{2.5}$, and O_3), and Fallon (PM_{10} and O_3). In addition, O_3 data is collected by the National Park Service at the Interagency Monitoring of Protected Visual Environments (IMPROVE) Site in the Great Basin National Park, located in White Pine County, Nevada.

The Elko monitoring station is located approximately 130 miles northeast of the Project Area. This is a State and Local Air Monitoring Site for continuous monitoring. The latest NDEP Trend Report for 2000-2010 reported there were no exceedances of the PM_{10} 24-hour standard, between 2000 and 2010 at the Elko station. The report also states that there were no exceedances reported for the PM_{10}, $PM_{2.5}$, and O_3 standards for the Fernley station, which is 85 miles southwest of the Project, and no exceedances reported for the PM_{10} and O_3 standards for the Fallon station between 2000 and 2010, which is 80 miles south of the Project Area (NDEP 2012).

Background Concentrations

To assess the potential impact of the Proposed Action on the ambient air quality, it was necessary to account for existing or background levels for each pollutant. No monitoring has been performed within the Project Area for ambient concentrations of $PM_{2.5}$, CO, NO_2, O_3, or SO_2, nor does the BAPC specify background concentrations for these pollutants. However, background values are necessary for the purpose of ambient air quality analysis. Most monitoring is undertaken in locations with relatively high population density where high pollutant levels might be expected. It is difficult to find monitoring data from locations as rural as the Project Area.

For unmonitored rural areas, such as the Project Area, the BAPC recommends background values of 10.2 $\mu g/m^3$ for the PM_{10} 24-hour averaging period, 9.0 $\mu g/m^3$ for the PM_{10} annual averaging period, and zero for all other criteria pollutants. The BAPC considers these values appropriate for remote mining facilities. The BAPC's practice for particulate analyses is to use measured concentrations from the IMPROVE monitoring stations, as representative background concentration for rural Nevada sites. **Table 3-5** shows the background pollutant concentrations used in the modeling analysis (Enviroscientists 2013).

TABLE 3-5 Background Values for Criteria Pollutants					
Pollutant and Averaging Time	**Monitor Location**	**Years of Data Reviewed**	**NAAQS ($\mu g/m^3$)**	**Background Value ($\mu g/m^3$)**	**Reference**
PM_{10}, 24-Hour	BAPC default value based on Lehman Caves, Great Basin National Park Monitoring Data	--	150	10.2	BAPC
PM_{10}, Annual	Great Basin National Park	--	50	9.0	BAPC
$PM_{2.5}$, 24-Hour	Great Basin National Park	2005-2007	35	7.0	EPA Air Data*
$PM_{2.5}$, Annual	Great Basin National Park	2005-2008	15	2.38	EPA Air Data*
NO_2, 1-Hour	Carlsbad, New Mexico	2008-2010	188	22	EPA Air Data*
NO_2, Annual	Trona, California	2002-2005	100	9.43	EPA Air Data*
SO_2, 1-Hour	Boulder City, Clark County, Nevada	2001-2003	196	18.6	EPA Air Data*
SO_2, 3-Hour	Trona, California	2002-2005	1,300	28.6	EPA Air Data*
SO_2, 24-Hour	Trona, California	2002-2005	365	18.3	EPA Air Data*
SO_2, Annual	Trona, California	2002-2005	80	5.3	EPA Air Data*
CO, 1-Hour	Barstow, California	2002-2005	40,000	3,771	EPA Air Data*
CO, 8-Hour	Barstow, California	2002-2005	10,000	1,666	EPA Air Data*

*http://www.epa.gov/air/data/index.html.
Source: Enviroscientists 2013

Existing Emissions

Active mining of ore ceased in April of 2011, FCMI currently operates only a leach pad and associated process facilities at the Florida Canyon Mine. The existing operations include sources of air pollutants such as generators, and on-site off-road equipment for operations associated with recontouring, grading, and reclamation activities.

Air emission estimates were calculated based on the maximum operations for each applicable time period, using EPA approved AP-42 emission factors (EPA 2009) for existing operations. **Table 3-6** shows the emissions of criteria pollutants, **Table 3-7** shows the HAPs emissions, and **Table 3-8** shows the GHG emissions for the existing operations at the Florida Canyon Mine.

TABLE 3-6 Florida Canyon Mine Emissions Summary							
Source Category	**PM**	**PM_{10}**	**$PM_{2.5}$**	**NOx**	**SO_2**	**CO**	**VOC**
Point Sources Emissions	0.71	0.68	0.48	11.59	0.09	3.30	0.84
Fugitive Sources Emissions	0.32	0.29	0.29	18.27	0.05	25.82	1.88
Insignificant Sources Emissions	0.00	0.00	0.00	0.00	0.00	0.00	0.78
Total (tons/year)	**1.03**	**0.97**	**0.77**	**29.86**	**0.14**	**29.12**	**3.50**

Source: Enviroscientists 2013

TABLE 3-7 Hazardous Air Pollutants Emissions for Existing Florida Canyon Mine	
HAPs	**Facility Total (tpy)**
Benzene	0.0054
Toluene	0.0021
Xylenes	0.0014
Formaldehyde	0.0020
Actealdehyde	0.0012
Acrolein	0.0002
Naphthalene	0.0008
Cobalt	0.0030
Cyanide	2.1685
Lead	0.0212
Mercury	0.0295
Total HAPs	**2.24**

Source: Enviroscientists 2013

TABLE 3-8 Greenhouse Gas Emissions for Existing Florida Canyon Mine			
Pollutants	**Emissions (tons/year)**	**GWP**	**Emissions (CO_2e)**
CO_2	9,968	1	9,968
CH_4	0.19	25	5
N_2O	0.31	298	92
Total CO_2 equivalent (metric tons)			**10,065**

Source: Enviroscientists 2013

3.2 CULTURAL RESOURCES

3.2.1 Regulatory Framework

The National Historic Preservation Act (NHPA) of 1966, as amended, and the Archaeological Resources Protection Act (ARPA) of 1979, as amended, are the primary laws regulating cultural resource preservation. NHPA and ARPA together provide a structure for the heads of federal agencies to follow when evaluating effects on Historic Properties listed or eligible for listing in the National Register of Historic Places (NRHP).

Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on Historic Properties and affords the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings. Project-related actions may adversely affect any site, structure, or object that is, or can be, included in the NRHP. These regulations, codified 36 CFR 60.4, provide criteria to determine if a site is eligible and apply to all federal undertakings and all cultural (archaeological, cultural, and historic) resources.

ARPA provides protection to archaeological resources and sites on public and Indian lands for the present and future benefit of the people. The intent of ARPA is to foster increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals having collections of archaeological resources. ARPA also makes it a crime with specific penalties, including fines and imprisonment, to remove artifacts from archaeological sites without proper permits.

3.2.2 Assessment Area

The assessment area for cultural resources is presented on **Figure 3-2,** which encompasses the Project Area.

3.2.3 Existing Environment

The entire Assessment Area has been inventoried for cultural resources. Three inventory reports present the findings: BLM Reports CR2-3188 (Hauer et al. 2012:III), CR2-3191 (Branch and Hauer 2012:I), and CR2-3213 (Branch and McMurray 2013:iii-iv). Eighteen sites were documented inside the Project Area boundary. Two sites, CrNV-22-3345 and -02-11711 are recommended eligible for listing on the NRHP under Criterion D. Three sites—CrNV-22-3342, the prehistoric component of -22-6319, and the historic component of -02-11945—remain unevaluated for the NRHP and are managed as though they are eligible. The 13 remaining sites within the Project Area have been determined to be non-contributing or ineligible for listing on the NRHP.

The NRHP-eligible sites are prehistoric Complex Lithic Scatters that contain hundreds of surface artifacts. Site CrNV-22-3345 was determined to be eligible under Criterion D during a previous inventory prior to an AMEC Environment and Infrastructure, Inc. (AMEC) update in 2012. AMEC confirmed the original eligibility determination as the site retains the potential to yield data relevant to prehistoric occupation and utilization of the area. Similar to CrNV-22-3345, -02-11711 has also been determined eligible under Criterion D for its potential to yield information pertinent to regional prehistory, though it was newly recorded in 2012. The three unevaluated sites remain as such pending subsurface testing to explore their data potential.

3.3 ENVIRONMENTAL JUSTICE

3.3.1 Regulatory Framework

Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was issued February 11, 1994 (59 Federal Register 7629). EO 12898 "is intended to promote nondiscrimination in Federal programs substantially affecting human health and the environment, and to provide minority and low-income communities access to public information on, and an opportunity for participation in, matters relating to human health and the environment." It requires each federal agency to consider environmental justice by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects, including social and economic effects, of its programs, policies, and activities on minority and low-income populations.

Pursuant to EO 12898, the President's CEQ prepared "Environmental Justice: Guidance under the Environmental Policy Act" (CEQ 1997b) to assist federal agencies with their NEPA procedures "… so that environmental justice concerns are effectively identified and addressed." This analysis was conducted with the assistance of the CEQ "guidance" document. The CEQ identifies groups as environmental justice populations when either (1) the minority or low-income population of the affected area exceeds 50 percent, or (2) the minority or low-income population percentage in the affected area is meaningfully greater than the minority population percentage in the general population or appropriate unit of geographical analysis.

In order to be classified "meaningfully greater", the formula used to describe the environmental justice threshold for this analysis is 10 percent (percentage points) above the State of Nevada

rate for Pershing and Humboldt Counties and a threshold of 10 percent above the respective County rate for communities (Lovelock and Winnemucca) for both local minority populations and low-income (poverty) rates.

For purposes of this section, minority and low-income populations are defined as follows:

- Minority populations are persons of Hispanic or Latino origin of any race, Blacks or African Americans, American Indians or Alaska Natives, Asians, and Native Hawaiian and other Pacific Islanders.
- Low-income populations are persons living below the poverty level. In 2012 the poverty weighted average threshold for a family of four was $23,624 and $12,119 for an unrelated individual (U.S. Bureau of the Census 2012).

3.3.2 Assessment Area

The assessment area for environmental justice encompasses Pershing County, including the city of Lovelock and Humboldt County including the city of Winnemucca, as presented on **Figure 3-3**.

3.3.3 Existing Environment

Minority Populations

Census data for the five-counties that comprise the Winnemucca District Office boundary, including Humboldt, Pershing, Washoe, Lyon and Churchill Counties, show that the white population is the dominant race in all five counties, and the Latino/Hispanic ethnic group comprised nearly 20 percent of the population, followed by Native American/Alaska Natives. Tribes have expressed interest in general land use and natural resource management issues in the BLM Winnemucca District and in access and use of traditional land, religious areas, and resources (BLM 2013a). Native American traditional uses specific to the Proposed Action are discussed in the Native American Religious Concerns section (Chapter 3.6).

Information regarding the ethnic composition of populations located within the assessment area is provided in Chapter 3.9 *Economics and Social Values* (**Table 3-12**). In general, both Pershing County and Humboldt County have a lower minority population than the State of Nevada with exception of American Indian populations; which are 4.1 to 4.8 percent for Pershing and Humboldt Counties, respectively, compared to 1.6 percent for the state. However, the American Indian population rates in these two counties are similar to that of the entire 5-county Winnemucca District Office boundary (BLM 2013a). The white population is more predominant (67-68 percent) within the Project Area, as compared to 53 percent statewide.

Economic Data

The second element of environmental justice is the potential for disproportionate adverse impacts to populations living below the poverty level. Poverty data provided by the Census Bureau characterize only a portion of the overall population. Groups not included in the poverty data are unrelated individuals under the age of 15; individuals living in group quarters such as correctional centers, institutions, college dorms, or military barracks; or individuals in living institutions without conventional housing (US Census Bureau 2014).

According to the Draft RMP, based on 2010 survey data on poverty, 10 to 20 percent of the population within the Winnemucca District Office boundary is minority and 10 to 20 percent of the population is considered below the poverty level (BLM 2013a)

Data on persons living below poverty level within the assessment area are presented in **Table 3-9**. Both Pershing and Humboldt County fall within this 10 to 20 percent category; while the City of Lovelock is somewhat higher at 23.5 percent and the City of Winnemucca is lower at 9.6 percent.

TABLE 3-9 Poverty Statistics of Assessment Area

Area	Poverty Statistics				
	Percent (%) in Pershing County	Percent (%) City of Lovelock	Percent (%) in Humboldt County	Percent (%) City of Winnemucca	Percent (%) in State of Nevada
Persons below poverty level, percent, 2008-2012	17.3	23.5	12.7	9.6	14.2

Source: U.S. Census Bureau, 2008-2012 American Community Survey 5-Year Estimates

3.4 INVASIVE, NON-NATIVE SPECIES

3.4.1 Regulatory Framework

The Federal Noxious Weed Act of 1974 provides for control and management of non-indigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health. The act prohibits importing or moving any noxious weeds identified by regulation, and allows for inspection and quarantines to prevent the spread of noxious weeds.

Executive Order 13112, Invasive Species, directs federal agencies to prevent the introduction of invasive species, to provide for their control, and to minimize the economic, ecological, and human health impacts caused by invasive species.

The Nevada Revised Statutes 555, Control of Insects, Pests, and Noxious Weeds law advises that landowners control noxious weeds and includes regulations to allow the Nevada Department of Agriculture to designate noxious weeds and create weed control districts to help control and eradicate noxious weeds.

3.4.2 Assessment Area

The Assessment Area for invasive, non-native species included the area that would be affected by the Proposed Action. For biological resources, other than raptors, the Biological Resources Assessment Area encompasses approximately 1,879 acres; previously delineated in APO #20 as the "NEPA boundary" (AMEC 2014).

3.4.3 Existing Environment

Invasive, non-native species include noxious weeds and other species that invade and colonize sites where the native vegetation and soil has been disturbed. Noxious weeds are defined under Nevada law (NRS 555.005) as any species of plant that is or is likely to be detrimental or destructive and difficult to control or eradicate. Noxious weeds are damaging to the environment

and local economy, and replace desirable vegetation. Often noxious weeds proliferate where native vegetation has been removed or disturbed such as on road margins or topsoil stockpiles. Fifty-two species of plants are listed as noxious weeds in Nevada (NRS 555.101). The only noxious weed, defined under Nevada law, which has been observed in the assessment area is medusahead; however other invasive species typically observed in the big sagebrush/Utah juniper and salt-desert shrub communities are listed on **Tables 3-17** and **3-18** of Chapter 3.19.3, respectively.

3.5 MIGRATORY BIRDS

3.5.1 Regulatory Framework

The Migratory Bird Treaty Act implements international treaties that provide for migratory bird protection. The act authorizes the Secretary of the Interior to regulate the taking of migratory birds. The act also provides that it shall be unlawful, except as permitted by regulations, "to pursue, take, or kill any migratory birds, or any part, nest or egg of any such bird", however, does not regulate their habitat. The list of species protected by the Migratory Bird Treaty Act was revised in March 2010 and includes 1,007 species that are native to the United States.

Executive Order (EO) 13186 directs federal agencies taking actions that are likely to have a measureable effect on migratory bird populations to develop and implement a Memorandum of Understanding with the U.S. Fish and Wildlife Service (USFWS) that promotes the conservation of migratory bird populations.

The USFWS and BLM signed, January 17, 2010, a Memorandum of Understanding pursuant to EO 13186 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. This Memorandum identifies specific activities where cooperation between agencies would contribute to the conservation of migratory birds.

3.5.2 Assessment Area

The Assessment Area for migratory birds, other than raptors, included the area that would be affected by the Proposed Action. The Assessment Area for raptors extends 10 miles from the Proposed Plan of Operations Boundary APO #20. For biological resources, other than raptors, the Biological Resources Assessment Area encompasses approximately 1,879 acres; previously delineated in APO #20 as the "NEPA boundary" (AMEC 2014, Figures7-1a—7-1d).

3.5.3 Existing Environment

Breeding bird surveys were conducted for a total of 11 days over the period June 10 to June 26, 2013 (AMEC 2014). Surveys were conducted between one-half hour before sunrise and 11:00 PST by walking parallel line transects spaced no more than 100 ft. apart. All birds encountered were recorded on GPS.

Twenty-six species of birds were recorded during breeding bird field surveys of the Assessment Area (**Table 3-10**). Horned larks (*Eremophila alpestris*) were the most-frequently observed, followed by the black-throated sparrow (*Amphispiza bilineata*), lark sparrow (*Chondestes grammicus*), rock wren (*Salpinctes obsoletus*), and western meadowlark (*Sturnella neglecta*). Active nests of horned larks and other nests of unknown species also were observed. Horned

larks were most frequently observed in the salt-desert scrub habitats, while black-throated sparrows were most common at higher elevations in the sagebrush/ juniper habitats. Horned larks and western meadowlarks appeared to be equally distributed in both habitats. Nine species were confirmed to nest in the Assessment Area, with six additional species probably breeding on site (**Table 3-10**).

Occupied raptor nests found within the 10-mile radius included a red-tailed hawk nest on the west flank of the Humboldt Range and two prairie falcon nests, one on the banks of the Humboldt River at Rye Patch Reservoir and one in the southeastern foothills of the Majuba Mountains. Additional data on raptors was obtained from NDOW records, which indicate that the red-tailed hawk, Cooper's hawk, prairie falcon (*Falco mexicanus*), long-eared owl (*Asio otus*), and great-horned owl (*Bubo virginianus*) nest within 10 miles of the Assessment Area. A barn owl (*Tyto alba*) also was observed in buildings at the mine (AMEC 2014).

TABLE 3-10 Birds Recorded in the Biological Resources Assessment Area in Breeding Bird Surveys

Scientific Name	Common Name and Breeding Status	Numbers Observed
Eremophila alpestris	Horned lark (CB)	474
Amphispiza bilneata	Black-throated sparrow (CB)	130
Chondestes grammicus	Lark sparrow (CB)	68
Salpinctes obsoletus	Rock wren (CB)	31
Sturna neglecta	Western meadowlark (PB)	26
Carpodacus mexicanus	House finch (CB)	32
Corvus corax	Common raven (BN)	21
Amphispiza belli	Sage sparrow (CB)	18
Spizella breweri	Brewer's sparrow (CB)	5
Zenaida macroura	Mourning dove (PB)	7
Sayornis saya	Say's phoebe (PB)	8
Aphelocoma californica	Western scrub-jay (PB)	5
Polioptia caerulea	Blue-gray gnatcatcher (CB)	10
Tachycineta thalassina	Violet-green swallow (CB)	4
Sialia currucoides	Mountain bluebird (PB)	7
Cathartes aura	Turkey vulture (BN)	3
Buteo regalis	Ferruginous hawk (BN)	2
Petrochelidon pyrrhononta	Cliff swallow (UN)	2
Buteo swainsoni	Swainson's hawk (BN)	1
Buteo jamaicensis	Red-tailed hawk (BN)	1
Columba livia	Rock dove (UN)	3
Aeronautes saxatalis	White-throated swift (BN)	1
Archilochus alexandri	Black-chinned hummingbird (UN)	1
Lanius ludovicianus	Loggerhead shrike (PB)	2
Hirundo rustica	Barn swallow (UN)	2
Thryomanes bewickii	Bewick's wren (UN)	1

Table Notes: CB= Confirmed breeder on site; PB= Probable breeder on site; BN= Suspected to breed in area of site, but not on site; UN= Breeding status in vicinity of site not known.

Source: AMEC 2014

3.6 NATIVE AMERICAN RELIGIOUS CONCERNS

3.6.1 Regulatory Framework

Several federal laws require BLM and other federal agencies to consult with affected tribes, tribal organizations and/or individuals with opportunities to participate in consultation and to advise on proposed projects that may have an effect on cultural sites, resources and traditional activities. These include the NHPA and ARPA noted above, as well as the American Indian Religious Freedom Act (AIRFA, P.L. 95-341), the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) (P.L. 101-601), and Executive Orders 13007 (1996, Indian Sacred Sites) and 13175 (2000, Consultation and Coordination with Indian Tribal Governments). These laws direct BLM to make best efforts to identify sites, resources and activities of religious, traditional and/or cultural importance, and subsequently attempt to limit or even eliminate negative effects on those resources. BLM also employs the BLM Manual Section 8120, *Tribal Consultation Under Cultural Resource Authorities* and guidance from National Register Bulletin 38, *Guidelines for Evaluating and Documenting Traditional Cultural Properties (TCPs),* in its consultation process.

As defined in National Register Bulletin 38, a TCP "can be defined generally as one that is eligible for inclusion in the NRHP because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community" (Parker and King 1998). Further, a TCP can be:

- A location associated with the traditional beliefs of a Native American group about its origins, its cultural history, or the nature of the world;
- A location where Native American religious practitioners have historically gone, and are known or thought to go today, to perform ceremonial activities in accordance with traditional cultural rules of practice; and
- A location where a community has traditionally carried out economic, artistic, or other cultural practices important in maintaining its historical identity.

3.6.2 Assessment Area

The assessment area for Native American Religious Concerns is the Project Area.

3.6.3 Existing Environment

BLM undertakes government-to-government consultation with the goal of identifying specific sites of religious, traditional, and/or cultural importance, activities, and resources that may be affected by proposed actions to limit, restrict, or eliminate negative impacts to those sites, activities, or resources. Letters requesting consultation on the Proposed Action were sent on July 25, 2013, to the Battle Mountain Band, the Lovelock Paiute Tribe, the Fallon Paiute and Shoshone Tribe, and the Pyramid Lake Paiute Tribe. Consultation by BLM staff is on-going. An informational meeting was held with the Fallon Paiute and Shoshone Tribe in February 2014 and they were notified that a treatment plan was being developed for the project. A consultation meeting was held with the Battle Mountain Band on May 12, 2014. The Battle Mountain Band felt the project was outside their areas of interest.

3.7 WASTE, HAZARDOUS OR SOLID

3.7.1 Regulatory Framework

Federal hazardous material and waste laws and regulations are applicable to hazardous substances used, stored, or generated by the Proposed Action. Applicable federal laws include the following: Hazardous and Solid Waste Amendments (HSWA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Toxic Substances Control Act (TSCA), Superfund Amendments and Reauthorizations Act (SARA), Resource Conservation and Recovery Act of 1976 (RCRA), and the Safe Explosives Act (SEA). Pursuant to regulations promulgated under Section 102 of CERCLA, as amended, release of a reportable quantity of a hazardous substance to the environment in a 24-hour period must be reported to the National Response Center (40 CFR Part 302). A release of reportable quantity on public land must also be reported to the BLM/BMRR.

3.7.2 Assessment Area

The assessment area for Waste, Hazardous or solid is the Proposed Plan of Operations Boundary APO #20.

3.7.3 Existing Environment

The Florida Canyon Mine is an active mining facility. Hazardous materials currently being used at the Florida Canyon Mine include vehicle and equipment fuels, fluids, lubricants, antifreeze, and solvents. Hazardous substances used in assaying and the gold extraction process include sodium cyanide, sodium hydroxide, hydrochloric acid, lime, flocculent, and anti-scalant. These hazardous materials are currently being used at the mine site daily. These reagents are transported, transferred from trucks to containers and containment areas, used, and disposed of according to federal and state regulations.

FCMI maintains a Spill Prevention, Control and Countermeasures (SPCC) Plan (SRK 2011; ASWT 2013) to establish measures designed to prevent oil and oil-related products from spilling and affecting the environment on-site or off-site of the Florida Canyon Mine. The SPCC Plan inventories all of the potential sources on the mine property and the protocols for preventing and reporting spills. Reportable spills as presented in the SPCC Plan are to be reported to the NDEP-BMRR and BLM as appropriate.

FCMI adheres to requirements for a conditionally exempt small quantity generator. Monthly inventories are maintained at Florida Canyon Mine and reported annually. FCMI has designated storage areas for all hazardous materials. The storage units consist of tanks or drums situated within a lined secondary containment unit (SRK 2011; ASWT 2013). All mine personnel involved in the transfer, loading, or unloading of oil or oil-related products are appropriately task-trained for each specific facility. Training is renewed annually, and certification is maintained at the site Environmental office. FCMI has approved staging facilities, safety measures, transportation, and handling requirements already in use and would continue to utilize these measures during the Proposed Action. Used materials would be recycled where possible. No increase in the quantity of hazardous materials stored and used on-site and no increase in the quantity of hazardous waste generated is anticipated as a result of implementing the Proposed Action. For estimated volumes stored and used please refer to FCMI's SPCC Plan (ASWT 2013e).

All non-hazardous and/or solid waste is disposed of in an existing NDEP approved waivered Class III landfill located on-site.

Based on the above discussion, this resource has not been carried forward for analysis in this EA.

3.8 WATER QUALITY (SURFACE/GROUND)

3.8.1 Regulatory Framework

The administration, preservation, and appropriation of water resources in Nevada include both state and federal regulations. NDEP has primacy for administration of the Clean Water Act. NDEP defines waters of the state of Nevada as water courses, waterways, drainage systems, and groundwater. When a proposed project has the potential to directly or indirectly affect water, the State of Nevada is authorized to implement its own permit programs under the provisions of state law or the federal Clean Water Act. NDEP requires compliance with National Pollution Discharge Elimination System (NPDES) permits related to discharge of wastewater to surface waters from discharge points.

The Nevada Water Pollution Control Law gives the State Environmental Commission authority to require controls on diffuse sources of pollutants, if these sources have the potential to degrade the quality of waters of the state. This same law also provides the state with authority to maintain water quality for public use, agriculture, existing industries, wildlife, and economic development. Nevada has been granted authority by EPA to enforce drinking water standards established under the Clean Water Act.

The administration and adjudication of water rights within the state is the responsibility of the Nevada Division of Water Resources (NDWR), State Engineer's Office. Water appropriations are also obtained through the Nevada State Engineer.

3.8.2 Assessment Area

The assessment area for water resources is the Nevada State Hydrologic Assessment Area, the Imlay Area (Basin 72; 493,440 acres) of the Humboldt River Hydrographic Basin (Basin 4), within which seep, spring and groundwater surveys have been carried out. The Hydrologic Assessment Area is shown on **Figure 3-8**.

3.8.3 Existing Environment

The Project Area is located in a physiographic setting characterized by north-south trending mountain ranges separated by structurally controlled alluvial basins which are typical of the Basin and Range province of northern Nevada. The Project Area lies on the western flank of the Humboldt Range which reaches elevations of 9,836 ft. AMSL at its highest point (Star Peak) immediately southeast of the mine. The Humboldt Range is bounded by the Humboldt River Valley to the north, Rye Patch Reservoir to the west, and by the Buena Vista Valley to the east.

Surface Water

The Humboldt River flows into Rye Patch Reservoir approximately seven miles north of the Project; the southern end of the reservoir is located approximately six miles south-southwest of the Project. The general flow direction of the Humboldt River through the Imlay area is from the northeast to the southwest. A portion of flow from the Humboldt River is diverted to Upper Pitt-Taylor Reservoir, which lies adjacent to the northern portion of Rye Patch Reservoir. The mine

is located in the Imlay Area (Area 72) of the Humboldt River Hydrologic Basin (Basin 4), in the federally defined Rye Patch Reservoir-Humboldt River Watershed (HUC 1604010809). The hydrologic basin contributing drainage to the Humboldt River upstream of Rye Patch Dam is comprised of 16,843 square miles in aerial extent. Water stored in Rye Patch Reservoir is used primarily for irrigation in the Humboldt River valley, and the reservoir is also used for boating, fishing and other recreational activities.

Mean monthly discharge in the Humboldt River reflects the snowmelt-driven hydrology of the region. Average monthly flows upstream of the reservoir for the period of record (1935-2012) ranged from 41 cubic feet per second (cfs) in October to 715 cfs in June (USGS 2012). Monthly peaks downstream of the reservoir generally occur in May and June at 636 and 560 cfs, respectively. The four highest flow volumes on the river were recorded after 1936.

Annual low flows prior to dam completion occurred in September and October. After dam completion, the annual low flows occurred from November through February and included approximately three times more water. These results reflect the extension of the irrigation season into September and October and the storage of winter inflow to the reservoir for the following irrigation season.

No surface water bodies exist within the Proposed Plan of Operation Boundary APO #20. However, intermittent drainages entering the Proposed Plan of Operation Boundary APO #20 include Florida Canyon, Wiley Gulch, Piedmont Canyon, Johnson Canyon, an unnamed drainage located to the south of Johnson Canyon, and Black Canyon (MGA, 2014a). The primary hydrologic function of these channels is to convey storm water from areas underlain by consolidated bedrock downslope to areas underlain by fractured bedrock or alluvial materials where it infiltrates into the regional basin-fill aquifer. Snowmelt runoff from the Humboldt Range generally infiltrates into hill slope colluvium prior to reaching the eastern boundary of the Florida Canyon Mine. Precipitation runoff within the Project Area is managed by a series of drainage ditches, diversion channels, and sediment ponds.

Based on USGS topographic map of the Imlay quadrangle (USGS 1987), as well as a study conducted by SWCA (1996b), no springs occur within the Proposed Plan of Operations Boundary APO #20. Two springs occur within the Florida Canyon Mine drainage basin; one spring is located up-gradient from the permit boundary in Florida Canyon, and another is located up-gradient from the permit boundary in Black Canyon. These springs result from groundwater flowing to the surface on top of rhyolite exposed in the canyons. Surface flow from the springs support deciduous riparian vegetation (e.g., willow, elderberry) for several hundred feet until water infiltrates into colluvium and the underlying Prida limestone prior to entering the Proposed Plan of Operations Boundary APO #20. An additional spring occurs near the mine Site, but outside of the Florida Canyon Mine drainage basin, located about a half mile upstream from Humboldt City in Humboldt Canyon. This spring, which arises from a contact between rhyolite and the Prida limestone, similar to the springs located in Florida Canyon, feeds brief intermittent flow in the Humboldt Canyon drainage.

No jurisdictional wetlands were identified within the Project Area. Other jurisdictional waters within the Project Area were identified as ephemeral drainages carrying intermittent runoff in response to snowmelt, precipitation events, and variations in local geology (SWCA, 1996a).

Groundwater

Groundwater within the Imlay area is derived from infiltration of precipitation, seepage from the Humboldt River, and groundwater flow through the alluvial valley fill from upstream (Eakin, 1962). Localized groundwater recharge is dominated by snow accumulation, with supplemental recharge achieved through seepage of nearby Rye Patch Reservoir and precipitation runoff infiltration occurring during storm runoff events in the adjacent Humboldt Range. The manner of groundwater use within the Imlay Area includes commercial, construction, domestic, industrial, irrigation, mining and milling, stock water, and quasi-municipal – predominant uses being industrial (geothermal), irrigation, and mining and milling.

Regional groundwater flow is generally toward the southwest, sub-parallel to the Humboldt River. Local groundwater flow directions generally follow the topographic gradient from the surrounding mountain ranges toward the Humboldt River. Groundwater is closest to the ground surface in areas adjacent to the Humboldt River and increases in depth toward the mountains (Harrill et al., 1988). Discharge of groundwater to the Humboldt River within the Imlay Hydrographic Area is variable, specifically in the vicinity of the Rye Patch Reservoir, where groundwater flow is influenced by reservoir levels and shoreline shapes. When reservoir levels are above the surrounding groundwater levels, the groundwater gradient slopes away from the reservoir, whereas, when reservoir levels are low, groundwater gradients reverse and flow toward the reservoir.

Groundwater beneath the Project Area can be characterized into four known aquifers. East of the range front fault, groundwater is limited to an unconfined bedrock aquifer with varying degrees of hydraulic connectivity. West of the fault, the groundwater system is comprised of an upper unconfined aquifer located in the upper alluvium, a semi-confined aquifer located in low permeability lower alluvium (and separated from the upper unconfined aquifer by a confining unit), and a semi-confined bedrock aquifer, which includes a geothermal resource.

The Project Area is located on the northern edge of the Humboldt House geothermal area, and three geothermal exploration wells have been drilled near the Project Area to date. The geothermal resource is estimated to be located at depths of greater than 780 ft. below land surface (bls) in the vicinity of the mine, however, there appears to be some geothermal influence at shallower depths. No geothermal springs are located in the Project vicinity.

Geochemical analytical results indicate that the upper alluvium aquifer water type is characterized as calcium bi-carbonate, the lower alluvium as calcium bi-carbonate and sodium/potassium chloride, and the bedrock west of the range front fault (geothermal) as sodium/potassium chloride water type. Although no inorganic analysis was conducted at the bedrock aquifer east of the range front fault, stable isotope analysis appears to indicate that this aquifer is similar in make-up to the upper alluvium aquifer (BAI, 1996).

Constituents that have been identified in the groundwater proximal to the project area which exceed drinking water maximum concentration levels (MCLs) include aluminum, antimony, arsenic, chloride, iron, manganese, mercury, nitrate, pH, and WAD cyanide. These constituents have been observed in the results of groundwater samples collected from the upper unconfined aquifer located in the upper alluvium, and the semi-confined aquifer located in the low permeability lower alluvium. Of these, aluminum, antimony, arsenic, chloride, iron, manganese, high pH, and TDS are presumed to be naturally occurring.

FCMI conducts routine groundwater monitoring as required by the State of Nevada WPC permit (NEV0086001). A groundwater plume consisting of WAD cyanide, mercury and nitrate was subsequently identified on the west side of the mine's leach pad and appeared to be related to process solution leakage. FCMI has worked in coordination with State agencies regarding monitoring and mitigation of groundwater contamination. Groundwater remediation began in April 2000. A corrective action plan (CAP) was submitted to the NDEP in April, 2013 (MGA, 2013). In accordance with the CAP, FCMI has identified and mitigated groundwater contaminant sources, as well as operated and optimized the groundwater plume pump-back system. A capture zone evaluation is conducted on a quarterly basis in order to verify that the plume migration has been halted, and that groundwater cleanup is occurring.

Seven production wells are located onsite. Five production wells (PW-1, PW-2, PW-3, PW-6 and PW-7) currently supply between 800 and 1,000 gpm of process make-up water to the Florida Canyon Mine. Well PW-5 is used as the site Public Water Source. A production well assessment was submitted to BLM in February 2014 (MGA, 2014b). Findings indicated that the production of FCMI's full water right would have limited impact on groundwater resources, and that actual anticipated production levels would have a negligible impact on groundwater resources.

3.9 ECONOMICS AND SOCIAL VALUES

3.9.1 Regulatory Framework

The Pershing County Master Plan (2012) provides guidance for future land use and community and economic development in Pershing County. Two guiding principles that are relevant to social and economic values related to the Project include:

- Fostering Economic Development; The County's resource based economy is subject to serious fluctuations as mineral prices shift, mines open and close and agricultural production varies. Agricultural employment has decreased as operations have become more mechanized. More economic stability is needed, particularly in the form of more secure middle wage jobs. The industrial park in Lovelock could become a valuable asset if the County is able to attract potential end users of the park. Mining will continue to be a boom/bust market that should be buffered with greater employment diversity. Quality medical and educational facilities are other important elements of economic development activities.
- Coordinating Growth and Service Provision; Increased cooperation between the County, city, state and federal agencies will enhance each jurisdiction's effectiveness. City/County growth coordination is particularly important in the area surrounding Lovelock. Cooperation between the County and BLM would be important to maintain access to public lands, to provide for a variety of appropriate uses and to review potential land swaps. Coordination with the school district would be needed to help secure appropriate sites and to ensure that student demands do not exceed school capacities.

The Humboldt Master Plan (undated) includes the following economic development goals relevant to social and economic values related to the Project:

- To achieve a diversified and stable economy that is compatible with planned growth and quality of life objectives, provides adequate employment and business opportunities for current and future generations, and strengthens the tax base;

- To maintain and enhance natural resource-based industries including mining, agriculture, ranching, recreation and tourism, and seek value added manufacturing of these resources; and
- To promote economic development that provides continuing employment, economic vitality, increased tax base, and is consistent with the plan's goals and policies.

3.9.2 Assessment Area

The assessment area for economics and social values comprises Pershing County, including the community of Lovelock, as well as Humboldt County and the city of Winnemucca (See **Figure 3-3**). The assessment area is based on the location of the Florida Canyon Mine in Pershing County and the resident locations of current mine employees in both southern Humboldt County (Winnemucca) as well as Pershing County (Lovelock).

3.9.3 Existing Environment

Population and Demographics

The population of Nevada grew by approximately 35 percent between 2000 and 2010 and is estimated to have grown another 2 percent between 2010 and 2012. Nevada was the fastest growing state over this timeframe (US Census Bureau, 2011). Population of cities and counties in the assessment area are shown below **Table 3-11**. Of note, Humboldt County and the City of Winnemucca have seen population increase; though at a rate slower than the state, while the population of Pershing County and the City of Lovelock has been generally stable.

TABLE 3-11 Population Statistics and Estimates of Assessment Area

Area	Population Statistics and Estimates			
	2000 Census	2010 Census	2012 Estimates	Percent Change 2010 to 2012
Winnemucca	7,174[1]	7,396[2]	7,729[2]	4.4%[2]
Lovelock	2,003[1]	1,894[1]	1,895[1]	0.0%
Humboldt County	16,106[1]	16,528[2]	17,048[2]	3.1%[2]
Pershing County	6,693[1]	6,753[2]	6,749[2]	-0.1%[2]
Nevada	1,998,257[1]	2,700,551[2]	2,754,354[2]	2%[2]

Sources: 1: US Census Bureau, American Fact Finder; 2: State and County QuickFacts

Table 3-12 shows that Pershing County varies from Humboldt County and the State of Nevada as a whole with respect to gender and age. Specifically, population and demographic statistics for Pershing County are somewhat skewed given that approximately 25 percent of its total population is institutionalized (incarcerated) in the Lovelock Correctional Center. In 2010, 1,681 of the 6,753 individuals in Pershing County were identified as part of the institutionalized population; a vast majority of which were men (1,668) (US Census Bureau American Fact Finder 2010).

By comparison, 1 percent of both Humboldt County and State of Nevada's population are classified as institutionalized. This comparatively high institutionalized population skews Pershing County's gender distribution in particular (64 percent male for total County population versus 51 percent for non-institutionalized County population). In addition, Pershing County has a somewhat different age distribution, with a smaller percentage of its population being children under 5 years of age.

TABLE 3-12 Demographic Statistics of Assessment Area					
Area	**Demographic Statistics (Reported in Percent [%])**				
	Pershing County	**City of Lovelock**	**Humboldt County**	**City of Winnemucca**	**State of Nevada**
Gender, 2012					
Female	36.1	49.9[1]	47.8	49[1]	49.6
Male	63.9	50.1[1]	52.2	51[1]	51.4
Age					
Persons under 5 years of age, 2012	4.3	7.4[1]	7.6	8.2[1]	6.6
Persons 18 years of age and over, 2012	81.9	71.3[1]	72.9	71.9[1]	75.9
Persons 65 years of age and over, 2012	13.6	15.9[1]	10.2	9.9[1]	13.1
High School graduate or higher, percent of persons age 25+ (2008-2012)	80.4	86.0[1]	81.3	82.1	84.4
White alone persons, not Hispanic or Latino, percent, 2012	67.3	63.4[1]	67.8	67.9[1]	52.9
Persons of Hispanic or Latino origin, percent, 2012	22.8	25.3[1]	25.0	27.4[1]	27.3
American Indian and Alaska Native persons, percent, 2012	4.1	7.9[1]	4.8	2.1[1]	1.6
Black persons, percent, 2012	4.1	0.8[1]	1.1	0.6[1]	8.9

Sources: US Census Bureau: State and County QuickFacts and American Fact Finder
[1] 2010 statistics are latest available for City of Winnemucca and City of Lovelock (2010 Census).

Income, Employment, and Economy

Based on 2012 figures, employment in Nevada is dominated by service industries and the trade, transportation and utilities sector. The leisure and hospitality industry (inclusive of gaming, hotel, recreation, and food service) has the highest proportion of employment with 28 percent of the state's workforce in the sector alone. The next largest employment sector is trade, transportation, and utilities with approximately 19 percent of the jobs statewide.

Approximately one percent of jobs statewide are in the natural resource and mining industries (Nevada Department of Employment, Training, and Rehabilitation 2012). Employment by major industry with statewide employment by the same sector is shown in **Table 3-13**.

TABLE 3-13 Employment by Sector in 2012 for Pershing County, Humboldt County and State of Nevada			
Sector	**Employment Number**		
	Pershing County	**Humboldt County**	**State of Nevada**
Private Sector Industries	1,114	6,964	987,848
• *Natural Resources and Mining*	*663*	*2,391*	*17,695*
• *Construction*		*447*	*51,775*
• *Manufacturing*	*31*	*278*	*39,193*
• *Trade, Transportation and Utilities*	*179*	*1,419*	*217,086*
• *Information*		*68*	*12,713*
• *Financial Activities*	*21*	*98*	*52,270*
• *Professional and Business Services*	*24*	*602*	*144,532*
• *Education and Health Services*	*28*	*406*	*105,849*
• *Leisure and Hospitality*	*130*	*1,072*	*316,993*
• *Other services*	*33*	*181*	*28,888*
Government	700	1,437	143,997
Unclassified			857[1]
Total All Industries	**1,814**	**8,401**	**1,131,844[1]**

Source: Nevada Department of Employment, Training, and Rehabilitation 2012 data.

[1] Data as reported directly from source. Unclassified employment was not included in the Total of All Industries tally in the source document.

Mining has been and continues to be important to the economic well-being of Nevada. Nevada leads the nation in production of gold and provides the highest average salary of any industry in Nevada. Nevada gold production accounted for approximately 79 percent of total US production and approximately 6.8 percent of world production (Dobra 2010). Average earnings for metal mining workers in 2010 totaled $85,907, compared to $83,176 for all mining workers, and $42,536 for all workers statewide (Dobra 2010).

Based on more recent county data, the 2012 average annual wage for a worker in Humboldt County was $50,159. The average annual wage for a worker in the natural resources and mining sector (inclusive of mining, agricultural, forestry, fishing and hunting sectors) was $81,120. Average annual wage for an employee in the leisure and hospitality sector was $17,765.

The 2012 average annual wage in Pershing County totaled $46,472. The average annual wage for a worker in the natural resources and mining sector was $65,650. Average annual wage for an employee in the leisure and hospitality sector was $15,578 (Nevada Department of Employment, Training, and Rehabilitation 2012).

Public Finance

Taxes paid by mining operations are a primary source of revenue for the State of Nevada, counties, and local governments. Based on information from the Nevada Department of Taxation and industry surveys, estimated state and local taxes paid by the mining industry in 2010 were approximately $314 million. This figure includes only taxes paid by mining companies and does not include taxes paid by industry employees or suppliers (Dobra 2010).

General tax categories paid by mining companies include: employment taxes, Net Proceeds of Minerals (NPM) taxes, sales and use taxes on purchases, and property taxes. Based on an analysis of 2011 fiscal year data and industry data, the average taxes paid per employee by industry (including sales and use tax, property tax, gaming percentage fees, NPM taxes) was the highest in the natural resources and mining sector at almost $24,775 per employee. The average among all employees in Nevada totaled approximately $6,078 per employee. In examining only the metal ore mining segment of the natural resources and mining sector, this total averaged nearly $33,000 per employee (Applied Analysis, undated).

NPM taxes are primarily paid to the county where the ore is mined. Companies pay property taxes based on the location of the property and sales taxes at the point of purchase. Since many of the companies providing services to the Florida Canyon Mine are located in Humboldt County, and most mine employees live and purchase products and services in Humboldt County, the county receives substantial mining related tax revenue.

Net proceeds taxes distributed for all mining operations across the state of Nevada in Fiscal year 2012-13 totaled $255.6 million. NPM taxes paid to Pershing County for all nine active operations in that county totaled $2.054 million over that same time frame. NPM taxes paid to Pershing County by FCMI that fiscal year amounted to $515,000 (Nevada Department of Taxation 2013).

Housing

Pershing County

In 2010, there were 2,464 housing units in Perishing County; 82 percent were occupied and 18 percent were vacant. This compares to an average occupied housing rate of nearly 86 percent in Nevada as a whole. Of the occupied houses in Pershing County, 69 percent were owner-occupied and 31 percent were renter occupied. Statistics for Lovelock show that of the 945 total housing units, 81 percent were occupied and 19 percent were vacant; however the percentage of owner-occupied units was lower at approximately 55 percent (US Census Bureau American Fact Finder 2010). The median value of owner-occupied housing units in Pershing County (2008-2012) totaled $136,600 (US Census Bureau QuickFacts 2013); compared to a median price of $190,900 in Nevada as a whole.

Humboldt County

In 2010, there were 7,123 housing units in Humboldt County; 88 percent were occupied and 12 percent were vacant. Of the occupied housing, 71 percent were owner-occupied and 29 percent were renter occupied. Statistics for Winnemucca show that 91 percent of housing units (2,926 of 3,214 total) are occupied. Of these, 64 percent are owner occupied units (US Census Bureau American Fact Finder 2010). The median value of owner-occupied housing units in Humboldt County (2008-2012) totaled $150,500 (US Census Bureau QuickFacts 2013). Winnemucca's median value of owner-occupied units was slightly higher at $173,900, though still lower than the statewide median of $190,900.

Community Facilities and Services

Both Pershing County and Humboldt County are rural, with main population centers in Lovelock and Winnemucca, respectively. Community service providers for education, law enforcement, fire protection, ambulance services, health care, and recreation are summarized below.

Pershing County

The Pershing County School District includes one high school and one middle school both in Lovelock and two elementary schools; one in Lovelock and one 40+ miles north in Imlay. The high school serves approximately 200 students while the middle school enrolled 142 students as of the 2010-2011 school years (Pershing County School District 2014).

Limited health care and emergency services in Pershing County are provided by the Pershing General Hospital in Lovelock, which includes a 38-bed long-term care facility, emergency services, radiology, and laboratory services (Pershing General Hospital 2014).

Recreational opportunities in and around Lovelock include facilities associated with the Pershing County School District as well as a community center, three public parks, skateboard park, and a public swimming pool (City of Lovelock 2014).

Law enforcement is provided through the Pershing County Sheriff's Department, Lovelock Police Department, and Nevada Highway Patrol. Fire protection and ambulance service for the city and Pershing County are provided by the Lovelock Fire Department (Pershing County 2014).

In addition the Lovelock area is home to the Lovelock Correction Center, which serves as a medium security prison for approximately 1,681 inmates. Staff includes 213 protective services

and program staff as well as 35 other professional and administrative staff (Nevada Department of Corrections, 2014).

Humboldt County

The Humboldt County School District serves approximately 3,500 students in 11 schools: three K-4 schools, one 5-6 middle school, one 7-8 junior high, and one 9-12 high school located in the community of Winnemucca, and four K-8 schools and one K-12 school in rural areas throughout Humboldt County (Humboldt County School District 20I4). Great Basin College maintains a branch campus in Winnemucca (HDA 2014).

Health care and emergency services are provided by the Humboldt General Hospital and include: acute care, pediatric care, obstetrics, a surgery center, radiology, laboratory and pharmaceutical services, respiratory therapy, cardio-vascular, and skilled nursing care (HDA 2014).

Municipal and private recreational opportunities in and around Winnemucca include two swimming pools (indoor/outdoor), motor sports race track, tennis courts, golf course, bowling, softball, baseball, soccer fields, shooting range, and skate board park.

Law enforcement is provided through the Humboldt County Sheriff's Department, Winnemucca City Police, and Nevada Highway Patrol. Fire protection is provided by the Winnemucca Volunteer Fire Department.

3.10 HISTORIC TRAILS

3.10.1 Regulatory Framework

The National Trails System Act of 1968 (NTSA) serves to distinguish National Scenic or National Historic Trails (National Trails). Federal agencies manage trails on, and across, various agency-managed lands in accordance with the NTSA using the Federal Trail Data Standards (FTDS). Formal trail designations are authorized through acts of Congress. Prior to Federal designation, historic trails are managed in accordance with the FLPMA of 1976, as amended. Additionally, the 2009 Omnibus Public Lands Management Act (OPLMA) established the National Landscape Conservation System (NLCS) in an effort to conserve, protect, and restore nationally significant landscapes that have outstanding cultural, ecological, and scientific values for the benefit of current and future generations (OPLMA Sec, 2002(a)). Together, the NTSA, FLPMA, and OPLMA, and sections therein, guide trail management and aid in NEPA compliance efforts.

Trails may also possess tangible remains (e.g., traces, tracks, artifacts) and are often considered archaeological resources. Therefore, trail systems and segments fall under the management purview of the National Historic Preservation Act (NHPA) of 1966, as amended, and the Archaeological Resources Protection Act (ARPA) of 1979, as amended. NHPA and ARPA, and their implementing legislation, provide a structure for evaluating effects on Historic Properties listed or eligible for listing in the National Register of Historic Places (NRHP). The NRHP is the official Federal list of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, and culture. Historic trails are subject to listing on the NRHP. ARPA provides protection to archaeological resources and sites on public and Indian lands for the present and future benefit of the people. ARPA also makes it a crime with specific penalties, including fines and imprisonment, to remove artifacts from archaeological sites without proper permits. Section 106 of the NHPA requires federal agencies to take into

account the effects of their undertakings on Historic Properties, including trails, and affords the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings.

In 2012, the BLM issued new guidance for management of National Scenic and Historic trails and trails under study or recommended as suitable for Congressional designation, including the National Scenic and Historic Trail Administration - Manual #6250; and Management of National Scenic and Historic Trails and Trails under Study or Recommended as Suitable for Congressional Designation – Manual #6280.

3.10.2 Assessment Area

The assessment area for Historic Trails is the Project Area as viewed from three key observation points (KOP) along the historic California Emigrant Trail (California Trail) to the west of Interstate 80. **Figure 3-4** locates three KOPs and **Figures 3-5**, **3-6** and **3-7** display the respective photographs of the project area from each KOP.

3.10.3 Existing Environment

Segments of the California Emigrant Trail (California Trail) corridor traverse through the Humboldt River basin several miles west of the Project Area. The nearest segments of the California Trail lie west of Interstate-80 paralleling Upper Pitt-Taylor Reservoir and Rye Patch State Recreation Area. The historic California Trail, initially established in 1841, became a key transportation route along the Humboldt River for emigrants traveling to California and western Oregon. In 1992, Congress designated the California Trail as a National Historic Trail. The National Park Service subsequently prepared a Comprehensive Management and Use Plan/Final Environmental Impact Statement for the Oregon, California, Mormon Pioneer, and Pony Express National Historic Trails in 1999 (BLM 2013a)

The existing viewshed in and around the segments of the California Trail nearest to the Project Area includes Interstate 80, Rye Patch Reservoir, Lower Pitt-Taylor Reservoir, and some of FCMI's existing mine features. Major mining elements consist of a series of connected open pits, waste rock storage, 400+ acre leach pad approximately 200-300 ft. in height and associated processing plant, access and haul roads. Exploration roads are visible on the piedmont slopes near the active mine site. The existing heap leach pad is in various stages of concurrent reclamation. Existing structures in and around the Project Area include power transmission lines and poles, offices and a shop/warehouse, a water tank, roads, sediment ponds, carbon columns, crusher and radio tower.

3.11 NOISE

3.11.1 Regulatory Framework

In response to the Federal Noise Control Act of 1972, EPA has identified noise levels requisite to protect public health and welfare against hearing loss, annoyance, and activity interference (EPA 1974). The document identifies a 24-hour exposure level of 70 A-weighted decibels (dBA) as the level of environment noise which would prevent measurable hearing loss over a lifetime.

EPA has identified outdoor levels of 55 dBA and indoor levels of 45 dBA as desirable to protect against noise interference and annoyance. These levels of noise are considered those that would permit spoken conversation and other activities such as sleeping, working and recreation, which

are part of the daily human condition. The levels are not single event, or "peak" levels. Instead, they represent averages of acoustic energy over periods of time such as eight or 24 hours, and over longer periods (e.g., years). These criteria are for human health and not for wildlife.

EPA defines the guideline as day and night sound level, L_{dn} of 55 dBA for outdoors in residential areas, farms, and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use. The guideline is L_{eq} (equivalent or energy-averaged sound level) of 55 dBA for outdoor areas where people spend limited amounts of time, such as school yards, and playgrounds (EPA 1974). Outdoor sites are generally unacceptable if exposed to sound levels of 70 dBA L_{eq} or greater (EPA 1974).

The Federal Highway Administration establishes an exterior noise level standard for residential uses of 67 dBA equivalent or energy-averaged sound level (L_{eq}) during peak hours. There are no standards for open or vacant property.

Pershing County does not have a noise ordinance and does not specify acceptable noise limits.

Mine Safety and Health Administration (MSHA) has an Occupational Noise Exposure Standard that protects miners by setting noise exposure levels and outlining required remediation.

3.11.2 Assessment Area

The assessment area for noise is the nearest identified sensitive receptors to the Project Area, which is the Humboldt House and farm, located west of Interstate-80, approximately 1 mile from the Project Area.

3.11.3 Existing Environment

Existing noise sources in the vicinity of the Project Area include general environmental noise resulting from wildlife, livestock, weather (i.e., wind; storm events), as well as noise associated with existing mining operations. Existing noise sources also include vehicular traffic on I-80.

3.12 PALEONTOLOGY

3.12.1 Regulatory Framework

BLM manages paleontological resources under a number of federal laws including: Public Law 111-011, the Paleontological Resources Protection Act (PRPA), which requires the Secretary of the Interior and Agriculture to manage and protect paleontological resources on federal land using scientific principles and expertise; FLPMA Sections 310 and 302(b), which direct the BLM to manage public land to protect the quality of scientific and other values; 43 CFR 8365.1-5, which prohibits the willful disturbance, removal, and destruction of scientific resources or natural objects; 43 CFR 3622, which regulates the amount of petrified wood that can be collected for personal, noncommercial purposes without a permit; and 43 CFR 3809.420(b)(8), which stipulates that a mining operator "shall not knowingly disturb, alter, injure, or destroy any scientifically important paleontological remains or any historical or archaeological site, structure, building or object on Federal lands."

Informational memorandum (IM) No. 2008-009, effective October 15, 2007, defines the BLM classification system for paleontological resources on public land. Descriptions for the classes used in the Potential Fossil Yield Classification (PFYC) system are intended to serve as guidelines rather than strict definitions. Knowledge of the geology and the paleontological

potential for individual units or preservational conditions should be considered when determining the appropriate class assignment. In addition, IM No. 2009-11, effective October 10, 2008, provides guidelines for assessing potential impacts to paleontological resources to determine mitigation steps for federal actions on public land under FLPMA and NEPA. Together, these two IMs, in combination with the PFYC system, provide guidance for the assessment of potential impacts to paleontological resources, field survey and monitoring procedures, and recommended mitigation measures that protect paleontological resources impacted by Federal actions.

3.12.2 Assessment Area

The assessment area for Paleontology is the Project Area.

3.12.3 Existing Environment

Stratigraphy in the Florida Canyon Mine area generally consists of Quaternary alluvium underlain by Upper Triassic Grass Valley Formation. The Upper Triassic Natchez Pass Formation underlies the Grass Valley Formation in the western portion of the site. These units are cut by intrusive dikes and sills. The Fencemaker Pass Thrust Fault separates the Grass Valley Formation from the underlying Middle Triassic Prida Formation. The Prida Formation overlies the Permian Rochester Rhyolite, which consists mostly of flows, tuff and tuffaceous sediments.

Quaternary Alluvium

Quaternary deposits overlie the Grass Valley Formation in the Project Area. They consist of recent alluvial fan deposits derived from adjacent bedrock and consist of poorly sorted sand, silt, gravel and boulders. Locally, the deposits form a relatively thin veneer over bedrock in the western portion of the proposed new disturbance area. Regionally, Quaternary units include lake, landslide, playa and dune sand deposits and can be up to 8,000 ft. thick in some valleys (Johnson 1977). Quaternary lake deposits have been identified in the extreme western portion of the proposed permit boundary area. According to a report of a paleontological assessment performed for FCMI's Standard Mine (approximately 5 miles south of Florida Canyon Mine), numerous vertebrate fossils have been discovered within alluvial deposits in Pershing County, including a fragment of a vertebrate fossil found in the vicinity of the Standard Mine area(Applied EarthWorks, Inc. 2014). Vertebrate fossil locations are held in confidence to protect the resource.

Gold mineralization is hosted in the Grass Valley Formation, which consists primarily of mudstone and sandstone, sometimes altered to argillite and quartzite (Thomason, 2002). This Upper Triassic formation has been identified as originating in a shallow marine and deltaic complex and can be up to a few thousand ft. thick in the northwestern Humboldt Range (Johnson, 1977). Rare fossils, consisting of plant imprints and marine invertebrates, have been found in the Grass Valley Formation (Johnson, 1977; Applied EarthWorks, Inc., 2014).

The Natchez Pass Formation is divided into two members in the Humboldt Range. The upper member has a basal section of impure limestone with both volcanic and clastic rocks that grade upward into massive carbonate rocks. The lower member consists of massive carbonates that interfinger with mafic volcanic rocks in the southern part of the range. The massive carbonate units form prominent outcrops in the Humboldt Range. Marine invertebrate fauna have been described in the Natchez Pass Formation (Silberling and Wallace, 1969). A paleontological

assessment for the Standard Mine indicates that one vertebrate fossil (Thalattosaur) has been recovered from the formation; the location of the discovery was not provided (Applied EarthWorks, Inc., 2014).

The Prida Formation, along with the Natchez Pass Formation, comprises the Middle to Upper Triassic Star Peak Group. They have been identified as forming in a back-reef environment (Johnson, 1977).

The Prida Formation has been divided into upper, middle and lower members. The lower member has its thickest exposures at the northern end of the Humboldt Range. It has been divided into three units consisting generally of basal clastic rocks, a middle unit of carbonate rocks, and an upper unit of siltstone and sandstone.

The middle member of the Prida Formation has been described as relatively homogenous, despite thinning from north to south within the Humboldt Range. It consists primarily of thin to medium bedded silty shale and siltstone with lesser amounts of thin to medium bedded fossiliferous limestone.

The upper member of the Prida Formation may interfinger with the Natchez Pass Formation. It is a lithologically distinct unit composed of dark, laminated thin to medium bedded limestone and dolomite with thin beds and stringers of dark chert.

Fossils throughout the Prida Formation have been studied extensively. The middle member is exposed at Fossil Hill, which is located on the east side of the Humboldt Range. Fossils in the middle and lower members are marine (pelagic or pseudopelagic) clams, ammonoids, nautiloids and vertebrates. The upper member appears to be only sparsely fossiliferous. Review of the online collections database maintained by the University of California, Museum of Paleontology indicated the 190 specimens have been documented in Pershing County, Nevada. This includes all 11 vertebrate fossil localities from within the Prida Formation (Applied EarthWorks, Inc., 2014).

The Prida Formation is shown at depth, below the thrust fault, in cross sections of the Project Area and is not expected to be encountered during new disturbance (ASW, 2013d).

No vertebrate fossils are known to have been encountered within or in the near vicinity of the Project Area (Applied EarthWorks, Inc., 2014; Standard Gold Mining, Inc., 2004). However, mine personnel have indicated that invertebrate fossils have been sited upgradient of the proposed new disturbance and existing mine site (Personal Communication, May 7, 2014). The Potential Fossil Yield Classification, along with the geologic formations, is presented on **Figure 3-9**.

3.13 PUBLIC ACCESS

3.13.1 Regulatory Framework

Management direction for the 8.4 million acres of lands administered by the BLM Winnemucca District is provided by the Sonoma-Gerlach and Paradise-Denio Management Framework Plans (MFP) (1982, amended 1999). The proposed Project Area is within the Sonoma-Gerlach MFP which includes a stated objective (Objective L-5) of ensuring legal access to all public lands. In accordance with FLPMA Section 501(a), BLM is authorized to grant, issue, or renew road rights of way (ROWs) through public lands.

3.13.2 Assessment Area

The assessment area for public access is the Project Area.

3.13.3 Existing Environment

The Project Area is accessed via Interstate 80 and a paved two-lane frontage road. The frontage road provides access to FCMI facilities via access and haul roads, as well as access to a communication facility located in Section 12 of T31N, R33E. The existing disturbance attributed to FCMI's haul and access roads within the existing APO #18 is approximately 98 acres. Florida Canyon Mine also encompasses various publicly accessible roads to Florida Canyon, Johnson Canyon, and Black Canyon. Several existing named public roads (issued as Pershing County ROWs in BLM records) in and around the Project Area include Antelope Canyon Road, Black Canyon Road, Foothill Road, Humboldt Canyon Road, and Johnson Canyon Road.

3.14 RANGLELAND MANAGEMENT

3.14.1 Regulatory Framework

The BLM is committed by policy and directed by law (the Taylor Grazing Act of 1934, as amended and supplemented, the FLPMA and the Public Rangeland Improvement Act of 1978) to manage forage in a sustained yield basis and to improve the condition of the public rangelands.

Regulations (43 CFR 1601.05(b) and CFR 4100.08) require the BLM manage livestock grazing on public lands under the principles of multiple use and sustained yield. To accomplish these goals, livestock grazing is permitted on public rangelands within specific administration areas called allotments. The grazing permits have specific terms and conditions, including livestock numbers and season of use, that are managed to attain allotment specific objectives and the Standards for Rangeland Health. Permits are evaluated periodically by the BLM to determine whether management goals are being met.

3.14.2 Assessment Area

The assessment area for rangeland management is the Project Area.

3.14.3 Existing Environment

The BLM manages livestock grazing over eight million acres of public lands and over a hundred allotments throughout the Winnemucca District. An allotment generally consists of public lands, administered by the BLM, but may also include parcels of private lands. These allotments consist of an area of land designated and managed by the BLM where one or more livestock operators are authorized to graze their livestock. The BLM manages livestock grazing in a manner aimed at achieving and maintaining public land health. To achieve desired conditions, the agency uses rangeland health standards and guidelines that the BLM developed in the 1990's with input from citizen-based Resource Advisory Councils.

The proposed APO #20 boundary is located entirely within the Humboldt House Allotment. The Humboldt House allotment consists of 22,500 acres of public land (BLM 2013a). Based on GIS data analysis, there are approximately 24,426 BLM-managed acres supporting 728 animal unit months (AUMs) within the Humboldt House allotment in total. Currently surface water and natural drainages support livestock grazing. There is an existing 22,849 ft. fence on the southern

portion of the Florida Canyon Mine to keep livestock outside of the mine as presented in **Figure 3-10**.

3.15 REALTY

3.15.1 Regulatory Framework

Management direction for the 8.4 million acres of land administered by BLM is provided by the Sonoma-Gerlach and Paradise-Denio MFPs (1982, amended 1999). The proposed Project is located within the Sonoma-Gerlach MFP which provides for mineral exploration and development within the Project Area. Also, in accordance with FLPMA Section 501(a), BLM is authorized to grant, issue, or renew ROWs over, upon, under or through public land.

Land authorizations required for private land falls under the 2009 Pershing County Development Code (Title 17 of Pershing County Code). Land in the Project Area must comply with regulations for the Agricultural-Mining-Recreation Regulatory Land Use District (LUD). Any residential construction in this LUD must comply with Chapter 503 of the Development Code.

3.15.2 Assessment Area

The assessment area for realty is the Project Area.

3.15.3 Existing Environment

The Project Area is characterized by a long-standing checkerboard public/private land ownership pattern. The Railroad Act of 1862 granted to the railroad every other section (one square mile) twenty miles each side of the railroad centerline. This grant resulted in a checkerboard pattern of public-private land parallel to the railroad right-of-way. In addition to the land grants, a 400-foot right-of-way was also given to the railroad company (BLM 2013a).

Based on 2011-2012 data, approximately 76 percent of the 3.8 million acres in Pershing County are considered public land. Approximately 16 percent of land in the county is assessed as agriculture. The County's Land Use and Growth Coordination element promotes growth in areas where infrastructure is already in place including in-fill development thereby reducing the need for new public facilities. The private land in and around the Project Area is designated as Agricultural-Mining-Recreation Regulatory LUD and has a maximum density of 1 dwelling unit per 160 acres (Pershing County 2013).

Land use within and in the vicinity of the Project Area consists mainly of existing disturbance associated with current mining operations, livestock grazing, wildlife habitat, and recreational use. In addition, numerous ROWs exist in and around the Project Area and APO #20 including roads, highways, communication sites, fiber optic cables, pipelines, and transmission lines as outlined in **Table 3-14**. In addition, the Nevada BLM GIS data (BLM 2014a) lists eight (8) authorized geothermal leases generally located (grouped) in T31N, R33E just west of the existing Florida Canyon Mine.

TABLE 3-14 Rights-of-Way Within and Near the Project Area				
Serial Number	**Type of Land Use**	**Location**	**ROW Width / Acres**	**ROW Holder**
CC-08790	Buried fiber optic cable	T31N, R33E, Sec. 4,16 T32N, R33E, Sec. 34	20 ft.	Nevada Bell
CC-020906	Interstate 80	T31N, R33E, Sec. 4,16 T32N, R33E, Sec. 34	400 ft.	Nevada Department of Transportation
CC-021254	Pipeline	T31N, R33E, Sec 1 T32N, R33E, Sec. 34	50 ft.	Southern Pacific
N-004195	Transmission line	T31N, R33E, Sec. 4	25 ft.	Sierra Pacific Power
N-004218	Communication line	T31N, R33E, Sec. 4	20 ft.	Nevada Bell
N-005676	Communication site (100 ft. by 100 ft.)	T31N, R33E, Sec. 12	.23 acres	Union Pacific Railroad
N-006088	Communication site (100 ft. by 100 ft.) / access road	T31N, R33E, Sec. 12	4.19 acres	Humboldt County
N-006407	Transmission line	T31N, R33E, Sec. 2, 12	25 ft.	Sierra Pacific Power
N-012105	Communication site (100 ft. by 100 ft.)	T31N, R33E, Sec. 12	.23 acres	WTN Inspirational BCST Inc.
N-022262	Communication site (100 ft. by 100 ft.) / access road	T31N, R33E, Sec. 12	.253 acres	FAA
N-056108	Aerial Transmission Line/Switching Station	T31N, R33E, Sec. 22	1.268 acres	Sierra Pacific Power
N-056389	Access Road	T31N, R33E, Sec. 16	80 ft.	Pershing County
N-056518	Transmission Line	T31N, R33E, Sec. 22	50 ft.	Sierra Pacific Power
N-057143	Communication line	T31N, R33E, Sec. 22	20 ft.	Nevada Bell
N-060769	Transmission line	T31N, R33E, Sec. 4, 16, 22 T32N, R33E, Sec. 34	90 ft.	Sierra Pacific Power
N-060880	Transmission line (buried)	T31N, R33E, Sec. 1, 12 T32N, R33E, Sec. 34	50 ft.	Sierra Pacific Power
N-065550	Fiber optic cable (parallel to Interstate80)	T31N, R33E, Sec. 4, 16 T32N, R33E, Sec. 34	20 ft.	Wiltel Communications
076935	Antelope Canyon Road	T31N, R33E, Sec. 22	14 ft.	Pershing County
076936	Black Canyon Road	T31N, R33E, Sec. 13,14,16	14 ft.	Pershing County
076940	Foothill Road	T31N, R33E, Sec. 10, 22	14 ft.	Pershing County
076942	Humboldt Canyon Road	T31N, R33E, Sec. 1	12 ft.	Pershing County
076943	Johnson Canyon Road	T31N, R33E, Sec. 4,10,14	14 ft.	Pershing County
088369	Transmission Line	T31N, R33E, Sec. 22 T32N, R33E, Sec. 34	100 ft.	Sierra Pacific Power
NEV-051028	Interstate 80	T31N, R33E, Sec. 16	400 ft. (varies)	Nevada Department of Transportation
NEV-056199	Interstate 80	T31N, R33E, Sec. 4,16 T32N, R33E, Sec. 34	1 acre	Nevada Department of Transportation
NEV-058689	Natural gas pipeline/compressor station	T31N, R33E, Sec. 4	50 ft.	Southwest Gas Corp.

Source: LR 2000 Database (BLM 2014).

The Proposed Action would not incur changes to existing ROWs, current or future geothermal leases, or existing land ownership. As such, this resource use has not been carried forward for analysis in this EA.

3.16 RECREATION

3.16.1 Regulatory Framework

The BLM manages recreation and travel on public land in accordance with existing laws, regulations, and policies. Program policy guidance is developed at the national, state, and district office level and includes regulations, manuals, handbooks, strategic action plans, instruction memorandums, and information bulletins.

FLPMA is the organic act that provides overall legislative direction to the BLM for all its management activities and responsibilities. Title 43 U.S.C. §§1701 (a)(8) (§102(a)(8)) requires that "public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use." Currently, management direction for the 8.4 million acres of the Winnemucca District is provided by the Sonoma-Gerlach and Paradise-Denio MFPs (1982, amended 1999). The State of Nevada also provides generalized management direction for recreational resources and periodically completes a Statewide Comprehensive Outdoor Recreation Plan (SCORP) as a requirement of the Land and Water Conservation Fund (L&WCF) program administered by the National Park Service (L&WCF Act of 1965). The 2010 Nevada SCORP provides an assessment of outdoor recreation opportunities present in the state and provides a framework (strategies) for improving and expanding upon these opportunities (Nevada Department of Conservation and Natural Resources 2010).

The Board of Wildlife Commissioners has the authority under NRS 501.181 to establish hunting seasons and quotas for big game animals such as mule deer, antelope, and bighorn sheep as well as game birds.

3.16.2 Assessment Area

The assessment area for recreation is the Project Area.

3.16.3 Existing Environment

Visitation estimates for the entire Winnemucca District totaled approximately 148,262 recreational users in 2010 based on the Recreation Management Information System analysis. Sixty percent of these annual visitors focused on the Water Canyon Recreation Area near Winnemucca and Pine Forest/Blue Lakes Recreation Area in northern Humboldt County. Annual visits and annual visitor days are reportedly increasing throughout the district). The five most popular dispersed recreational activities within the district include off-highway vehicle (OHV) use, hunting, pleasure driving, fishing, and camping (BLM 2013a).

No developed BLM recreational facilities exist within proximity to the Project Area. The nearest developed areas, Rye Patch Reservoir and the lower and upper Pitt Taylor reservoirs (under the jurisdiction of Bureau of Reclamation and Nevada State Parks), are located 2 to 3 miles to the northwest of the proposed Project. No special recreation permits are known to occur within the Project Area.

The Proposed Action would not impact recreation in and around the Project Area, nor would it cause adverse effects to existing recreational access from Interstate 80 through the Project Area

to the Humboldt Range (See Chapter 4.12). As such, this resource use has not been carried forward for analysis in this EA.

3.17 SOIL

3.17.1 Regulatory Framework

BLM Regulations for surface management of public land mined under the General Mining Law of 1872 (30 USC §22 et seq.) are provided in 43 CFR 3809. Specifically, 43 CFR 3809.1 required mining-related activities to minimize impacts to soil resources. Guidance for reclamation is provided in BLM Handbook H-3042-1 (1992).

State of Nevada laws and regulations, NAC 445A.350- NAC 445A.447 (Mining Facilities) and NAC 519A.010- NAC 519A.415 (Regulation of Mining Operations), were developed to implement the requirements of the NRS 445A.300- NRS 445A.730 (Water Pollution Control) and NRS 519A.010- NRS 519A.290 (Reclamation of Land Subject to Mining Operations). The purpose of these statutes are in part to ensure that the lands disturbed by mining operations are reclaimed to safe and stable conditions, which includes soil conservation through erosion control.

A SWPPP is required for Project development and is implemented by the NDEP through the Nevada storm water NPDES permit program with appropriate erosion control features designed to meet BMPs. Assessment Area

The assessment area for soil is the Project Area.

3.17.2 Existing Environment

Soil in the Project Area has been mapped by the NRCS (NRCS 2013). According to the NRCS, the Misad-Golconda-Tenabo and the Atlow-Wiskan associations are the only associations within the Project Area, as presented on **Figure 3-11**.

A soil association typically contains three major soil types, with some minor soil types, that exhibit a repeating characteristic pattern. The association represents a geographic area. The associations within the Project Area are described in further detail below.

Misad Series

The Misad Series consists of well drained, extremely gravelly coarse sand and gravelly loamy sand overlain by very gravelly sandy loam to fine sandy loam. The Misad soil occurs on alluvium fan skirts with slopes of approximately 2 to 8 percent.

Golconda Series

The Golconda Series consists of well drained, very fine sandy loam and gravelly clay loam over a cemented layer at about 23-36 inches bgs. Below the cemented layer is stratified, extremely gravelly loamy coarse sand to very gravelly sandy loam. The Golconda soil occurs on alluvium fan remnants. Slopes range from about 2 to 8 percent.

Tenabo Series

The Tenabo Series consists of well drained, gravelly very fine sandy loam and clay loam over an indurated layer at about 17-24 inches bgs. Beneath the indurated layer is stratified, extremely gravelly coarse sand to very gravelly sandy loam. The Tenabo soil occurs on fan remnants with slopes of approximately 2 to 8 percent.

Atlow Series

The Atlow Series consists of well drained, very gravelly loam and gravelly clay loam. Un-weathered bedrock is located approximately 15 to 25 inches bgs. The Atlow soil occurs in mountainous areas with slopes of about 30 to 50 percent.

Wiskan Series

The Wiskan Series consists of well drained, very gravelly loam and gravelly clay loam. Un-weathered bedrock is located approximately 35 to 45 inches bgs. The Wiskan soil occurs in mountainous areas with slopes of about 30 to 50 percent.

3.18 SPECIAL STATUS SPECIES

3.18.1 Regulatory Framework

Special-status species are those plants and animals listed, candidate, or proposed for listing under the Endangered Species Act of 1973 and species managed as "sensitive" by BLM. The Endangered Species Act of 1973 (16 USC1531 et seq.), as amended, provides for the conservation of federally listed plant and animal species and their habitats. The ESA directs federal agencies to conserve listed wildlife species and imposes an affirmative duty on these agencies to ensure that their actions are not likely to jeopardize the continued existence of a listed species or adversely modify its critical habitat.

BLM Manual 6840 provides management policy for federally listed species and BLM-designated sensitive species. Species classified as BLM-designated sensitive must be native species found on BLM-administered land for which BLM has the capability to significantly affect the conservation status of the species through management, and either:

- There is information that a species has recently undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or a distinct population segment of the species is at risk across all or a significant portion of the species range; or
- The species depends on ecological refugia or specialized or unique habitats on BLM-administered land, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk. BLM protects and manages habitat for the enhancement and protection of the species future existence.

The Bald and Golden Eagle Protection Act prohibits the take or possession of bald and golden eagles with limited exceptions. Take, as defined in the act, includes "to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb". Disturb means to agitate or bother a bald or golden eagle to a degree that causes or is likely to cause, based on the best scientific information available, injury to an eagle; a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior. An important eagle use area is defined as an eagle nest, foraging area, or communal roost site that eagles rely on for breeding, sheltering, or feeding and the landscape features surrounding a nest, foraging area, or roost site.

3.18.2 Assessment Area

The Assessment Area for biological resources varies for groups of species. The Assessment Area for raptors extended 10 miles from the Proposed Plan of Operations Boundary APO #20. The Assessment Area for special-status species, other than raptors, included the area that would be affected by the proposed expansion of the mine and ancillary facilities. For biological

resources, other than raptors, the Biological Resources Assessment Area (Assessment Area) encompasses approximately 1,879 acres; previously delineated in APO #20 as the "NEPA boundary" (AMEC 2014).

3.18.3 Existing Environment

No federally listed endangered or threatened species or their critical habitats are known to occur within the Assessment Area. However, based on field surveys and an evaluation of habitat features, BLM sensitive species are present or have the potential to occur within or near the Project Area. The BLM lists 28 sensitive plant species with the potential to be present regionally, including the Project Area (AMEC 2014). Typically, sensitive species occur in habitats such as pinyon-juniper; deep, loose, sandy soils; soils derived from volcanic ash; wetlands; talus/scree slopes; high elevations in mountains; and playas. The WDO's list of 54 sensitive animal species includes 2 amphibians, 16 bird species, 3 fish, 22 mammals, 5 insects, and 7 mollusks (AMEC 2014).

Field surveys conducted by AMEC (2014) recorded two sensitive plant species and 21 sensitive animal species utilizing habitat within the Assessment Area (**Table 3-15**), including 4 raptors, 2 migratory birds, 2 small mammals, and 13 bats. Although not observed during baseline studies, the bald eagle is periodically present in the Assessment Area as a transient, probably attracted to Rye Patch Reservoir because of its prey base of fish and waterfowl. Records from the Nevada Natural Heritage Program indicate that the western snowy plover also has been recorded near Rye Patch Reservoir. No surveys were conducted for the Preble's shrew or dark kangaroo mouse because a take permit was not issued due to the mortality risk associated with trapping small mammals. Given the presence of suitable habitat, these animals are assumed to be present for this analysis.

Upslope areas of the Assessment Area, dominated by big sagebrush and Utah juniper provide potential summer, winter, and nesting habitat for the greater sage-grouse (*Centrocercus urophasianus*); however, no sage-grouse were recorded during field surveys.

TABLE 3-15 Sensitive Species Recorded for the Biological Resources Assessment Area	
Scientific Name	**Common Name**
Plants	
Penstemon palmeri var. *macranthus*	Lahontan beardtongue
Grusonia pulchella	Sand cholla
Animals	
Accipter gentilis	Northern goshawk
Antrozous pallidus	Pallid bat
Aquila chrysaetos	Golden eagle
Buteo regalis	Ferruginous hawk
Buteo swainsoni	Swainson's hawk
Corynorhinus townsendii	Townsend's big-eared bat
Eptisicus fuscus	Big brown bat
Lanius ludovicianus	Loggerhead shrike
Lasiurus cinereus	Hoary bat
Lasionycteris noctivagans	Silver-haired bat
Microdipodops megacephalus	Dark kangaroo mouse
Myotis californicus	California myotis
Myotis ciliolabrum	Western small-footed myotis
Myotis evotis	Western long-eared myotis
Myotis lucifugus	Little brown bat
Myotis volans	Long-legged myotis
Myotis yumanensis	Yuma myotis
Parastrellus hesperus	Western pipistrelle
Sorex preblei	Preble's shrew
Spizella breweri	Brewer's sparrow
Tadarida brasiliensis	Brazilian free-tailed bat

Source: AMEC 2014

Plants

Sensitive plants were surveyed in two phases. The first phase was conducted in the sage-juniper foothill community during March 2012 and the second phase in the salt- desert scrub community was conducted in May 2013 (AMEC 2014). Surveys were conducted by walking parallel transects oriented on topographic and manmade features. Pedestrian survey routes were recorded using handheld global positioning system units (GPS). When terrain presented a safety concern, potential habitat was examined with the aid of binoculars.

When a special-status plant species was encountered, the immediate area was closely examined to assess population size. Locations of sensitive plant populations were recorded using GPS and are presented in **Figure 3-12**, and photographs were taken. In addition to special status species, the locations of buckwheat (*Eriogonum* spp.) were recorded because of their potential association with several species of special-status butterflies.

Data from the Nevada Natural Heritage Program (NNHP) database indicates that three sensitive plant species have been recorded within two miles of the Florida Canyon Mine, Lahontan beardtongue, obscure scorpion flower (*Phacelia inconspicua*), and Owyhee prickly phlox (*Leptodactylon glabrum*). The obscure scorpion flower was found in the Humboldt Range at higher elevation (ca. 7,300 ft.) and the Owyhee prickly phlox was found on steep cliffs, which are not present in the Assessment Area.

Field surveys, conducted by AMEC (2014) found two special-status plants in the Assessment Area; Lahontan beardtongue and sand cholla. During sensitive plant surveys, locations of buckwheat species were recorded because they are potential host plants for several butterflies, such as blue butterflies, which are sensitive species. No butterflies were noted during surveys, however six species of buckwheat were found at locations in the big sagebrush/juniper and salt-desert scrub communities (AMEC 2014).

Lahontan Beardtongue (Sensitive)

Lahontan beardtongue was found at two locations in the Assessment Area, Johnson Canyon and an un-named wash where one to three individuals were found on rocky soil. A common variety of Palmer's penstemon (*Penstemon palmeri var. palmeri*) has been planted in reclaimed areas of the Florida Canyon Mine. The introduction of this variety of penstemon (var. *palmer*i) poses a threat to the Lahontan beardtongue (var. *macranthus*) because the two varieties hydbridize and the genetically distinct Lahontan beardtongue can be extirpated by the more prolific Palmer's penstemon (AMEC 2014).

Sand Cholla (Sensitive)

Sand cholla is a sensitive species and in Nevada is protected from commercial harvest by statutes NRS 527.060 to 527.120. Sand cholla was found at three locations (6 individuals) in the Assessment Area (**Figure 3-12**). None of the locations were deep sand or dunes, where this species typically has been thought to be restricted. This cactus is small and hard to detect and may be overlooked and is more widespread than currently known (AMEC 2014).

Birds

Greater Sage-Grouse

The greater sage-grouse was determined to be a candidate species in 2010, but its listing has been precluded by other species. Due to a court ordered settlement, the USFWS has until 2015 to make a final determination on listing the greater sage-grouse under the Endangered Species Act.

The BLM has issued two Instruction Memorandums (IMs) for the protection of greater sage-grouse. IM 2012-043, Greater Sage-Grouse Interim Management Policies and Procedures, provides interim policies and procedures to the BLM to be applied to ongoing and proposed authorizations that affect greater sage-grouse, while long-term permanent measures are being developed (BLM 2011b). IM 2012-044, BLM National Greater Sage-Grouse Land Use Planning Strategy, provides direction to the BLM for the consideration of conservation measures, identified in "A Report on National Greater Sage-Grouse Conservation Measures" prepared by the Sage-Grouse National Technical Team, to apply during the land use planning process (BLM 2011c).

NDOW has mapped greater sage-grouse habitat in Nevada to support these IMs and published a Habitat Characterization Map in March 2012. The BLM used this NDOW map to identify Preliminary Priority Habitat (PPH) (Category 1) or Preliminary General Habitat (PGH) (collectively includes Category 2 and 3). Category 1 is defined as "Essential/Irreplaceable Habitat". Categories 2 and 3 are defined as "Important Habitat" and "Habitat of Moderate Importance", respectively. Based on a review of NDOW data, no PPH or PGH exists within the Biological Assessment Area (**Figure 3-13**).

Approximately 264 acres along the easternmost boundary of the Assessment Area are classified as "Low Value Habitat and Transitional Range" (Category 4). NDOW defines Category 4 as areas that naturally contribute very little value to sage-grouse other than transitional range from one seasonal habitat to another or minimal foraging use (e.g., salt desert scrub communities, natural pinyon/juniper woodlands, aspen stands, and mountain mahogany stands), as well as areas that currently contribute very little value due to fire, land use development, pinyon/juniper encroachment, and other impacts that would require restoration efforts beyond the acceptable cost/benefit ratio at this time (NDOW 2012).

Northern Goshawk

The northern goshawk is widely distributed in North America and is uncommon resident of montane forests of the Great Basin. This hawk nests in conifers but its preferred nesting habitat in Nevada is in aspen groves, which often occur along streams and around springs (Ryser 1985). Their primary prey is birds. Field surveys identified this species as a transient in the Assessment Area, probably part of its foraging habitat (AMEC 2014). Additional data on raptors was obtained from NDOW records, which indicate that the northern goshawk nest is within 10 miles of the Assessment Area.

Ferruginous Hawk

Ferruginous hawks inhabit open grasslands, shrub-steppes and deserts, avoiding interior forest habitats and are summer residents of Nevada (Bechard and Schmutz 1995). Ferruginous hawks nest in trees, shrubs, and on rocky outcrops, often using the same nest for an extended period (Bechard and Schmutz 1995). In Nevada, ferruginous hawks typically nest in juniper trees and tend to avoid nesting in areas converted to agriculture (Ryser 1985). Fall migration begins in August and continues through early September. The approximate nesting period occurs from April through July. Loss of suitable habitat to agricultural conversion and overgrazing by livestock are primary factors causing population decline. Field surveys identified this species as a transient in the Assessment Area, probably part of its foraging habitat. Additional data on raptors was obtained from NDOW records, which indicate that the ferruginous hawk nests within 10 miles of the Assessment Area.

Swainson's Hawk

Swainson's hawks are summer residents in Nevada and are most common in grassland/shrubland habitats. They nest in river bottoms, brushy draws or shelterbelts; and forage in open grasslands, sparse shrublands, and small, open woodlands (Ryser 1985, Bechard et al. 2010). Swainson's hawk has adapted to foraging in areas of cultivated wheat and alfalfa. Swainson's hawks mainly forage on small mammals and at times may feed almost exclusively on insects, particularly grasshoppers (Bechard et al. 2010). They are a gregarious species, often migrating in flocks. The approximate nesting period occurs from May through mid-September. Field surveys observed

this species soaring over the Assessment Area. Potential nesting habitat is present in stands of trees around residences north of Interstate 80 highway, adjacent to the Assessment Area. Additional data on raptors was obtained from NDOW records, which indicate the Swainson's hawk nest within 10 miles of the Assessment Area.

Golden Eagle

Golden eagles range throughout western North America and parts of northeast Canada and breed and winter widely throughout Nevada. Golden eagles hunt by soaring over open lands such as prairie, sagebrush-grassland and open woodland habitats. Golden eagles eat primarily jackrabbits, ground squirrels, and carrion and occasionally prey on deer and antelope fawns, other small mammals, waterfowl and grouse (Montana Natural Heritage Program 2011). Golden eagles generally nest on cliffs, in large trees, or on artificial structures such as power poles and transmission towers (Ryser 1985, Kochert et al. 2002). The approximate courtship, nesting, and brood-rearing periods are from February through July. Many golden eagles winter in Nevada. Migrants may arrive March through April, with immature eagles arriving later (Kochert et al. 2002). There is concern that golden eagle populations in the western United States may be declining (Pagel et al. 2010). The majority of mortality in golden eagles is through human causes, with collisions with vehicles, power lines, and other structures being the leading cause (Kochert et al. 2002). Golden eagles were observed soaring over the Assessment Area and active and inactive nests were found in in the Humboldt Range and the Majuba Range, on rocky outcrops and cliffs (AMEC 2014).

The golden eagle is protected under the federal Bald and Golden Eagle Protection Act, which prohibits the take of bald or golden eagles without a permit. The procedure for obtaining an incidental take permit from the U.S. Fish and Wildlife Service is provided in the Federal Register (Vol. 74, No. 175/Friday September 11, 2009). The Bald and Golden Eagle Protection Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill capture, trap, collect, molest or disturb". Disturb means to agitate or bother eagles to a degree that causes or is likely to cause, based on the best scientific data available, injury to an eagle; decrease in productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or, nest abandonment by substantially interfering with normal breeding, feeding or sheltering behavior. The BLM also has policy guidance for addressing potential impacts of projects on golden eagles (Instruction Memorandum No. NV 2010-034). This memorandum indicates that the BLM Field Manager must notify applicants during the permitting process that construction and operation of a facility may result in take and that it is the applicant's responsibility to consult with the U.S. Fish and Wildlife Service and obtain any applicable permits. The BLM should also provide applicants federal guidelines for inventory and monitoring protocols.

Raptor nesting survey of the proposed APO #20 boundary and a surrounding 10-mile radius were conducted on June 4, 2013 and on June 5, 2013 from a helicopter (AMEC 2014). The primary focus of the survey was to locate and identify golden eagle nests, however all raptor nests found were identified and recorded. Survey flight lines and nest locations were recorded using GPS. The survey focused on potential raptor nesting habitats in cliffs, rock outcrops, large trees, and transmission line structures (power poles). Aerial surveys of the Assessment Area and a 10-mile buffer found 27 occupied and un-occupied golden eagle nests (AMEC 2014). Golden eagles typically construct and utilize more than one nest within the same territory and periodically alter nesting locations among nest sites.

Occupied nests within the 10-mile radius area were found in Echo Canyon on the western side of the Humboldt Range, and in upper Coyote and Wilson Canyons on the eastern side of the range. The Echo Canyon nest held a single young and young also were observed in the upper Coyote Canyon and Wilson Canyon nests. A single young was observed in the Coyote Canyon nest and two young were present in the Wilson Canyon nest, with a single young observed in the nest on a subsequent ground visit (AMEC 2014). Unoccupied golden eagle nests were found in the Humboldt Range and the southeastern foothills of the Majuba Mountains west of the Assessment Area.

Loggerhead Shrike

The loggerhead shrike is widely distributed but populations have declined throughout North America in recent decades. This species is migratory in the northern part of its range, in areas that do not accumulate large amounts of snow. It is likely a summer resident in the Assessment Area because of snow accumulation during most years. Migration of this species is not well known (Yosef 1996). The Shrike inhabits open country in shrub and grassland habitats and nests in trees and shrubs from March through June, with young fledging in approximately 11 weeks (Yosef 1996). This species was observed in the Assessment Area in sagebrush and salt desert scrub habitats.

Brewer's Sparrow

Like other grassland birds in North America, Brewer's sparrow populations are declining substantially throughout its range, which may be due to degradation of shrubland habitats (Rotenberry et al. 1999). Brewer's sparrows breed in shrublands with an average canopy height of less than 1.5 meters and are most closely associated with habitats dominated by big sagebrush (Rotenberry et al. 1999). Hansley and Beauvais (2004) report that shrub patch size may be a moderately significant determinant of this species' presence. In disturbed patches of sagebrush habitat in Idaho, Brewer's sparrows can nest in patches as small 15 acres even when surrounded by unsuitable habitat. The Brewer's sparrow was observed in big sagebrush habitat in the Assessment Area.

Small Mammals

Small mammals were not surveyed because of the potential of capture and handling to kill or injure the Preble's shrew and dark kangaroo mouse, two special-status species assumed present in the Assessment Area. Based on a review of habitat associations of small mammals and their range of occurrence in Nevada, common small mammals likely to be present in the Assessment Area include: the Great Basin pocket mouse (*Pergonathus parvus*), deer mouse (*Peromyscus maniculatus*), northern grasshopper mouse (*Onychomys leugaster*), western harvest mouse (*Reithrodontomys megalotis*), and the chisel-toothed kangaroo rat (*Dipodomys microps*) (Foresman 2012). Habitat in the Assessment Area also is suitable for the Preble's shrew and dark kangaroo mouse, sensitive species; however no surveys were conducted to determine if these species are present (AMEC 2014).

Preble's shrew

The ecology, life history, and habitat characteristics of Preble's shrew are not well known (Foresman 2012); however, it has been found mostly in sagebrush and grassland habitats and occasionally in coniferous forest, marshes, and riparian areas. Based on information available via NatureServe (2014) and NNHP species information (NNHP 2014), Preble's Shrew habitat

extends throughout northern Nevada in Elko, Humboldt and Washoe Counties potentially extending through 13.6 million acres. However, Ports and George (1990) report that studies in Elko County, Nevada suggest that this shrew may be more common and widespread in the northern Great Basin than previously supposed. No surveys were conducted for Preble's shrew in the Project Area; however based on the presence of acceptable habitat the species are assumed present. Suitable habitat is present on approximately 1,413 acres (75 percent) of the Assessment Area as presented on **Figure 3-14**, (AMEC 2014). This percentage of area does not represent available habitat throughout Nevada and is solely related to the assessment area only. No specific surveys were conducted for the Preble's shrew. Given the presence of suitable habitat, the Preble's shrew is assumed to be present for this analysis.

Dark Kangaroo Mouse

The dark kangaroo mouse is restricted to the Great Basin desert. Its preferred habitat occurs on fine gravelly soil, primarily valley bottoms and alluvial fans with big sagebrush, rabbitbrush (*Chrysothamnus* spp.), and horsebrush (*Tetradymia* spp.) vegetation. Based on calculations derived from Hafner and Upham 2011, the dark kangaroo mouse distribution is estimated to extend over 32.5 million acres across Nevada. This mouse usually enters hibernation by November and emerges in March. This mouse does not seem to need a free water source, apparently obtaining sufficient water from their food (O'Farrell and Blaustein 1974). Potentially suitable habitat is present for this species on 1,439 acres (77 percent) of the Assessment Area as presented in **Figure 3-14** (AMEC 2014). This percentage of area does not represent available habitat throughout Nevada and is solely related to the assessment area only. No specific surveys were conducted for the dark kangaroo mouse. Given the presence of suitable habitat the species is assumed present for this analysis.

Bats

Surveys were conducted in areas where bat activity was expected to be highest (i.e., near abandoned mine adits, rocky outcrops, wetlands, and potential movement corridors) (AMEC 2014). Bat calls were monitored at 14 survey stations as presented on **Figure 3-15** using instruments that recorded bat calls over a range of frequencies. Bat calls were classified to species or groups of species using computer software to assist interpretations by biologists. The electronic bat detectors were programmed to record bat calls from 30 minutes before sunset to 30 minutes after sunrise every night from June 14, 2013 to June 28, 2013 and from July 16, 2013 to July 30, 2013. Bat detectors were programmed to begin recording when audio signals surpassed 18 dB3 above the ambient noise levels.

Thirteen bat species (**Table 3-16)** have been documented to use habitat in the Assessment Area. Rock crevices in mining-pit walls likely provide roosting habitat and marginal breeding habitat. Caves, mines, and abandoned buildings present adjacent to the Assessment Area provide potential roosting and breeding areas for bats. Sagebrush communities likely provide foraging habitat. The most frequently detected species was the western small-footed myotis, a species that roosts singly or in small groups in rock crevices, buildings, caves, and mines and is commonly associated with desert habitats (Bradley et al. 2006). Infrequently recorded species included the California myotis, long-legged myotis, pallid bat, silver-haired bat, hoary bat, and Brazilian free-tailed bat. Bat activity patterns did not appear to be concentrated around specific habitat features in the Assessment Area.

Little is available in the literature about foraging range for many bat species and therefore, it is difficult to estimate how far a bat will forage from suitable roosting habitat and water sources. Water sources are critical to bats because they drink from open water and insects are more abundant around wetlands and open water. Studies in desert habitats have found that bat activity is 40 times greater near wetlands and riparian areas than in upland areas (Bradley et al 2006). Even high-elevation, tree-roosting bats fly to open water, wetlands, and riparian areas to drink and forage. A geothermal cooling pond is located immediately adjacent to the Assessment Area boundary and probably is attractive to bats. The open water and wetlands associated with Rye Patch Reservoir also are probably attractive to bats.

TABLE 3-16 Bat Species Detected in Biological Resources Assessment Area

Scientific name	Common Name
Antrozous pallidus	Pallid bat
Corynorhinus townsendii	Townsend's big-eared bat
Eptisicus fuscus	Big brown bat
Lasiruris cinereus	Hoary bat
Lasionycteris noctivagans	Silver-haired bat
Myotis californicus	California myotis
Myotis ciliolabrum	Western small-footed myotis
Myotis evotis	Western long-eared myotis
Myotis lucifugus	Little brown bat
Myotis volans	Long-legged myotis
Myotis yumanensis	Yuma myotis
Parastrellus hesperus	Western pipistrelle
Tadarida brasiliensis	Brazilian free-tailed bat

Source: AMEC 2014

Butterflies

Based on habitat characteristics and the presence of host plants for butterfly larvae (*Eriogonum* spp.), one sensitive species of butterfly, Great Basin small blue (*Philotiella speciosa septentrionalis*) has a low potential to occur in the Assessment Area (AMEC 2014). The preferred habitat for this species is deserts, edges of dry desert lakes, and edges of streams in foothills. No specific surveys for larvae or adults of this butterfly were conducted in the Assessment Area.

3.19 VEGETATION

3.19.1 Regulatory Framework

The FLPMA, Public Rangelands Improvement Act of 1978 (PRIA), 43 CFR 4180, and the NDEP BMRR revegetation standards provide the direction, goals, and objectives for vegetation management and reclamation success on BLM-administered public land in the Project Area.

3.19.2 Assessment Area

The Biological Resources Assessment Area (Assessment Area) for vegetation includes the area that would be affected by the proposed expansion of the mine and ancillary facilities. For

biological resources, other than raptors, the Assessment Area encompasses approximately 1,879 acres; previously delineated in APO #20as the "NEPA boundary" (AMEC 2014).

3.19.3 Existing Environment

The Assessment Area is located on rocky, west-sloping toe slopes, transitioning to steep slopes and cliffs in the Humboldt Range near the east boundary of the Florida Canyon Mine. Johnson Canyon, Florida Canyon, and Humboldt Canyon drain westward from the Humboldt Range through steep rocky terrain and cliffs and have formed incised ephemeral drainages that dissect the less-steep topography on the lower slopes where the proposed facilities would be located. Vegetation communities generally follow the physiography of the Assessment Area as presented on **Figure 3-16**.

The upper foothills of the Assessment Area support a community of Wyoming big sagebrush (*Artermisia tridentata*) and scattered Utah juniper (*Juniperus utahensis*) (AMEC 2014. The sagebrush/juniper community transitions downslope to a salt-desert shrub community as the topography changes from foothills to a series of alluvial fans, dissected by ephemeral drainages. The reclaimed mine areas include a salt-desert shrub community that has been seeded. Vegetation in the 1,879-acre Assessment Area is dominated by salt-desert shrubs (approximately 1,105 acres, 59-percent); with lesser amounts of big sagebrush and Utah juniper (approximately 261 acres, 14 percent); reclaimed mine facilities (approximately 256 acres, 14 percent); and an un-reclaimed mine pit with steep, terraced high walls (approximately 253 acres, 13 percent).

Big Sagebrush/Utah Juniper

The sagebrush-juniper community is dominated by big sagebrush and other shrubs, with scattered Utah juniper becoming more common with elevation and on cooler exposures. Common species in this community are listed in **Table 3-17**.

TABLE 3-17 Common Plants in Big Sagebrush/Utah Juniper Community	
Scientific Name	**Common Name**
Invasive Species	
Bromus tectorum	Cheatgrass
Decurainia sophia	Tansy mustard
Erodium cicutarium	Filaree
Lepidium perfoliatum	Pepperweed
Sisymbrium altissimum	Tumble mustard
Taeniatherum caputmedusae	Medusahead
Native Species	
Antennaria dimorpha	Low pussytoes
Aquilegia sp.	Columbine
Artemisia tridentata	Big sagebrush
Astragalus iodanthus	Humboldt River milkvetch
Astragalus purshii	Woolypod milkvetch
Astragalus serenoi	Naked milkvetch
Balsamorhiza sagittata	Arrowleaf balsamroot
Calachortus bruneaunis	Mariposa lily
Erigeron aphanactis	Rayless fleabane
Juniperus utahensis	Utah juniper
Lupinus argenteus	Silvery lupine
Mentzelia albicaulis	Whitestem blazingstar
Phlox hoodii	Hood's phlox
Poa secunda	Sandberg's bluegrass
Prunus andersonii	Desert peach
Sambucus nigra	Black elderberry
Zigadenus paniculatus	Foothills death camus

Source: AMEC 2014

Salt-Desert Shrub

Vegetation on the lower slopes is a salt-desert shrub community with an understory of forbs and grasses that have adapted to historic heavy livestock utilization and is typical of salt-desert shrub habitats described by West (1983). Common species in this community are listed in **Table 3-18**. Many of the understory species indicate a history of heavy livestock use including a large component of invasive species.

TABLE 3-18 Common Plants in the Salt-Desert Shrub Community	
Scientific Name	**Common Name**
Invasive Species	
Bromus tectorum	Cheatgrass
Halogeton glomeratus	Salt-lover
Lepidium perfoliatum	Pepperweed
Ranunculus testiculatus	Bur buttercup
Sisymbrium altissimum	Tumble mustard
Taeniatherum caputmedusae	Medusahead
Native Shrubs, Forbs, and Grasses	
Achnatherum hymenoides	Indian rice grass
Artemisia spinescens	Spiny budsage
Atriplex canescens	Four-wing saltbush
Atriplex confertifolia	Shadscale
Chysothamnus viscidiflorus	Green rabbitbrush
Elymus elymoides	Squirreltail
Eriogonum spp.	Buckwheat species
Grayia spinosa	Spiny hopsage
Krascheninnikovia lanata	Winterfat
Phlox hoodiii	Hood's phlox
Sphaeralcea grossularifolia	Gooseberry-leaf globemallow

Source: AMEC 2014

3.20 VISUAL RESOURCES

3.20.1 Regulatory Framework

Scenic quality is a measure of the visual appeal of a parcel of land. Section 102(a) (8) of FLPMA placed emphasis on the protection of the scenic quality of resources on public land. Section 101(b) of NEPA (1969) requires that measures be taken to ensure that aesthetically pleasing surroundings be retained for all Americans. To ensure these objectives are met, BLM created the Visual Resource Management (VRM) system.

Visual resources are the physical features on the landscape, such as land, water, vegetation and structures. Public land exhibits a variety of visual values which warrant different levels of management. The BLM VRM system is used to identify and evaluate scenic values to determine approximate management objectives and to determine if the proposed action affects to the scenic environment meet those objectives. The BLM Visual Resource Inventory Process provides a means to determine the visual values. The inventory consists of scenic quality evaluation, viewer sensitivity levels and a declaration of distance zones for the viewer to the resource to provide the representative relative value or management class rating of the visual resource.

Based on these values, BLM administered land is placed into one of four VRM Classes, Class I - Class IV in the land use planning process. These management classes provide planning level values to be used as the basis for consideration of landscape alteration to meet designated class planning objectives. Class objectives vary from Class I with limited activity to Class IV that allows major landscape modifications. The classifications do not establish management direction

and should not be used as a basis for constraining or limiting surface disturbing activities (BLM 1986). A reasonable attempt must be made to meet the VRM Class objective and minimize impacts of the Proposed Action in accordance with the policies and procedures in BLM Manual and Handbooks M-8400, H-8410-1, H-8431-1.

3.20.2 Assessment Area

The assessment area for Visual Resources is the viewshed of the Project Area.

3.20.3 Existing Environment

The Project Area is located in the northwestern portion of the Great Basin region of the Basin and Range physiographic province. The great basin is defined by broad open basins bounded by prominent north-south trending mountain ranges. Locally, the Project Area is located on the western facing piedmont slopes of the Humboldt Range, a north-south trending mountain range that lies east of the Florida Canyon Mine.

The Humboldt Range forms the backdrop for views from the Humboldt River basin. The mounded geometric shape of the existing heap leach pad and waste rock dumps contrast with the natural landforms of the horizontal to rolling alluvial fans at the base of the Humboldt Range. Existing pit mining, where visible, and exposed rock, deep red and white, contrasts with warm reds and browns of the mountain range. Sage brush and grass vegetation on the alluvial slopes of the mountain range and present on reclaimed mining features provides stippled regular uniform vegetation coverage. Vegetation on the upper slopes of the Humboldt Range is predominately Pinion-Juniper and is irregular and patchy. Existing structures in and around the Project Area include power transmission lines and poles, offices and a shop/warehouse, a water tank, roads, sediment ponds, carbon columns, crusher and radio tower. Major mining elements currently visible from vantage points within the area consist of a series of connected open pits, waste rock storage, 400+ acre leach pad approximately 200-300 ft. in height and associated processing plant, access and haul roads. Exploration roads are visible on the piedmont slopes near the active mine site. The existing heap leach pad is in various stages of concurrent reclamation. A significant portion of it has been re-contoured and the south end has been reclaimed with established sage and grass vegetation consistent with the adjacent alluvial fan. The northern end of the heap leach pad, constructed in benched lifts, contains a variety of vivid colors associated with varied material origins.

The Project Area lies within VRM Class II. This designation was established prior to the onset of mining activities by FCMI in 1986 and reflects the designation given to an area that lies at the base of the relatively scenic Humboldt Range and viewed from the well-travelled Interstate 80 corridor. The objective for this class is to provide for management activities that retain the existing landscape character. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the casual observer's attention.

3.21 WATER QUANTITY

3.21.1 Regulatory Framework

Water quantity in the State of Nevada follows both federal and state regulations. NDEP has jurisdiction over water courses, waterways, drainage systems, and groundwater. If a proposed project affects these water systems, the State of Nevada is allowed to implement proper permit programs under NDEP's primacy for administration of the Clean Water Act. The administration

and adjudication of water rights within the state is the responsibility of the NDWR, State Engineer's Office. Water appropriations are also obtained through the Nevada State Engineer.

3.21.2 Assessment Area

The assessment area for water quantity is the Hydrologic Assessment Area, the Imlay Area (Basin 72; 493,440 acres) of the Humboldt River Hydrographic Basin (Basin 4). The Hydrologic Assessment Area is shown on **Figure 3-8**.

3.21.3 Existing Environment

The NDWR State Engineer's office has issued water rights for 2,415 acre-feet per year for beneficial use at the Florida Canyon Mine. Groundwater pumping is conducted using onsite production wells to satisfy water supply needs including leaching and process circuit water, dust control and drinking water (MGA, 2014).

Historical pumping rates at Florida Canyon Mine range from 50.3 million gallons annually (154.4 acre-feet per year) in 2005 to 324.4 million gallons annually (995.9 acre-feet per year) in 2000 (MGA, 2014).

Based on NDWR records there does not appear to be any public water supply wells within close proximity of the Project Area. In issuing water rights, the Sate Engineer considers other water users in the vicinity of the point of withdrawal and beneficial use to ensure potential conflicts are addressed.

The Proposed Action would not incur changes to existing water quantity or rights. As such, this resource use has not been carried forward for analysis in this EA.

3.22 WILDLIFE

3.22.1 Regulatory Framework

Section 102.8 of the FLPMA states that the policy of the United States is to manage public land in a manner that protects the quality of multiple resources and provides food and habitat for fish, wildlife, and domestic animals. The Public Rangelands Improvement Act of 1978 directs BLM to improve rangeland conditions with due consideration given the needs of wildlife and their habitats. Wildlife must also have a reasonable amount of protection from adverse impacts associated with human disturbance and most human activities. This is especially true during breeding seasons and when wildlife use winter ranges.

Wildlife and fish resources and their habitat on public land is managed cooperatively by the BLM and NDOW under a memorandum of understanding (MOU) as established in 1971. The MOU describes BLM's commitment to manage wildlife and fisheries resource habitat, and NDOW's role in managing population. BLM meets its obligation by managing public land to protect and enhance food, shelter, and breeding areas for wild animals. NDOW assures healthy wildlife numbers through a variety of management tools including wildlife and fisheries stocking programs, hunting and fishing regulations, land purchases for wildlife management, cooperative enhancement project, and other activities.

NDOW administers state wildlife management and protection programs as set forth in NRS Chapter 501, Wildlife Administration and Enforcement, and NAC Chapter 503, Hunting, Fishing, and Trapping; Miscellaneous Protective Measures. NRS 501.110 defines the various

categories of wildlife in Nevada, including protected categories. NAC 503.010, 503.080, 503.110, and 503.140 list the wildlife species currently placed in the state's various legal categories, including protected species, game species, and pest species.

3.22.2 Assessment Area

The Assessment Area for biological resources varies for groups of species. The Biological Resources Assessment Area (Assessment Area) for general wildlife includes the area that would be affected by the proposed expansion of the mine and ancillary facilities. For biological resources, other than raptors, the Assessment Area encompasses approximately 1,879 acres; previously delineated in APO #20 as the "NEPA boundary" (AMEC 2014).

3.22.3 Existing Environment

Evaluations of habitats in the Assessment Area and adjacent areas were conducted by walking and driving transects to observe wildlife present or their sign (e.g., tracks, fecal deposits, skeletal remains, and trails) and to record dominant plants, which provide the structural and compositional components of habitats in the Assessment Area (AMEC 2012). The Nevada Natural Heritage Program and NDOW were contacted to obtain records of special-status plants animals that have been observed within or near the Assessment Area. BLM also provided records for nesting raptors within a ten-mile radius of the Project Area. Published and unpublished scientific studies, including internet documents, were reviewed to provide additional wildlife and habitat information. Aerial images and maps of the Project Area and surrounding areas were reviewed to assess habitat features. Management guidelines also were reviewed to help determine appropriate study areas and buffers for nesting raptors (Romin and Muck 1999).

The Assessment Area and adjacent areas have been identified by NDOW as providing habitat for mule deer (*Odocoileus hemionis*), bighorn sheep (*Ovis canadensis*), and pronghorn antelope (*Antilocapra americana*). Mule deer and pronghorn habitat is present in most of the Assessment Area and bighorn sheep habitat (330 acres) is present only at the highest elevation of the Assessment Area with cliff and rock outcrops. Bighorn sheep do not utilize habitat in the Assessment Area (AMEC 2014) as the habitat is only potential and currently no bighorn sheep are in the Humboldt Range.

During field studies on and near the proposed Project Area, the following mammals or their sign were observed: black-tailed jackrabbit (*Lepus californicus*), pronghorn antelope, mule deer, coyote (Canis latrans), Nuttall's cottontail (*Sylvilagus nuttallii*), and an unidentified species of pocket mouse (*Chaetodipus sp. or Perognathus sp.*). Reptiles observed were the long-nosed leopard lizard (*Gambelia wislizenii*), desert horned lizard (*Phrynosoma platyrhinos*), side-blotched lizard (Uta stansburiana), western whiptail (*Aspidoscelis tigris*), Great Basin collared lizard (*Crotaphytus bicinctores*), and Great Basin rattlesnake (*Crotalus oreganus lutosus*). Twenty-six species of migratory birds and raptors and 13 bat species were identified during field surveys (AMEC 2012 and 2014).

4.0 DIRECT AND INDIRECT IMPACTS

4.1 AIR QUALITY

4.1.1 Proposed Action

Criteria Air Pollutants

Dispersion modeling was used to assess potential air quality impacts resulting from pollutant sources associated with Proposed Action activities. These impacts include the operation of stationary and mobile equipment and fugitive emission sources associated with mining activities.

Air emission estimates were calculated based on the maximum material throughput for each applicable time period, using EPA approved AP-42 emission factors (EPA 2009) for the Proposed Action. **Table 4-1** shows the emissions, in tpy, that were used in the modeling analysis.

TABLE 4-1 Modeled Emission Rates for the Project

Source Category	PM	PM_{10}	$PM_{2.5}$	NOx	SO_2	CO	VOC[1]
Point Sources Emissions	0.69	0.65	0.48	11.12	0.09	3.03	0.84
Fugitive Sources Emissions	1,257.88	305.09	35.22	178.21	4.40	305.08	15.81
Insignificant Sources Emissions	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Project Total (tons/year)	**1,258.57**	**305.74**	**35.70**	**189.33**	**4.49**	**308.11**	**16.67**

[1]volatile organic compounds
Source: Enviroscientists 2013

The results of the dispersion modeling for the Project Area are presented in **Table 4-2**. This table shows the highest modeled results at any point of public access for all pollutant-averaging time combinations, the location (in Universal Transverse Mercator [UTM] North American Datum 1983 [NAD 83] coordinates) of the highest modeled public access receptor, and the lowest applicable standard (NAAQS or NSAAQS) for each of the pollutant-averaging time combinations.

TABLE 4-2 Highest Modeled Air Pollutant Concentrations from the Proposed Action at Receptor Points Accessible to Public						
Pollutant	**Averaging Time**	**Met. Data Year**	**Highest Modeled Receptor Point**			**Lowest Applicable Ambient Standard (μg/m³)**
			Receptor Location[1]		**Dispersion Modeling Results (μg/m³)[2]**	
			UTM Easting (m)	**UTM Northing (m)**		
PM_{10}	24-Hour	2006-2010	392699.30	4492039.30	21.06	150
	Annual	2006	392601.40	4491836.70	43.36	50
$PM_{2.5}$	24-Hour	2006-2010	392699.30	4492039.30	10.21	35
	Annual	2006	392666.70	4491971.70	7.47	15
SO_2	1-Hour	2006-2010	395883.40	4494144.30	18.63	196
	3-Hour	2009	392209.70	4491026.40	28.65	1,300
	24-Hour	2009	392709.40	4490226.90	18.40	365
	Annual	2006	392688.40	4492016.70	5.42	80
CO	1-Hour	2009	395517.80	4494175.60	3,787.33	40,000
	8-Hour	2008	392198.80	4491003.90	1,703.81	10,000
NO_2	1-Hour	2006-2010	393160.50	4492982.50	32.49	188
	Annual	2006	392688.40	4492016.70	72.19	100

[1] All coordinates in UTM projection, NAD 83.
[2] Background values, as listed in Table 3-5 are included.

Table 4-2 shows that the emissions from stationary and mobile equipment and fugitive dust emissions associated with the Proposed Action, including background concentrations, would not exceed the NAAQS or NSAAQS.

Hazardous Air Pollutants Emissions

Annual HAP emissions from the activities associated with the Proposed Action would result from the handling of earthen materials, combustion of hydrocarbon fuels, operation of thermal units, and handling and use of various chemicals. The emission totals include all stationary sources, as well as the process fugitive emissions from mining and processing operations for the open pit, waste rock dump, and heap leach area. The fugitive dust from trucking, dumping, and blasting are also included.

A summary of the total HAPs emissions that would be emitted from Project activities is presented in **Table 4-3**. The facility-wide HAPs emissions would be 5.75 tpy and cyanide compound would be the highest emitted single HAP at 5.46 tpy. These estimated emissions include both fugitive and process sources. The estimated Hg emissions also include emissions of Hg from the thermal units permitted under the Mercury Operating Permit to Construct at the mine.

TABLE 4-3 Hazardous Air Pollutants Emissions for the Florida Canyon South Expansion Project	
HAPs	**Facility Total (tpy)**
Benzene	0.0530
Toluene	0.0210
Xylenes	0.0145
Formaldehyde	0.0330
Acetaldehyde	0.0205
Acrolein	0.0026
Naphthalene	0.0071
Antimony	0.0008
Arsenic	0.0101
Beryllium	0.0002
Cadmium	0.0001
Chromium	0.0260
Cobalt	0.0068
Cyanide	5.4566
Lead	0.0391
Manganese	0.0261
Mercury	0.0295
Nickel	0.0027
Selenium	0.0001
Total HAPs	**5.75**

Source: Enviroscientists 2012

EPA thresholds for any single HAP or all HAPs combined are ten and 25 tpy, respectively. With the exception of Pb, no ambient air quality standards exist for HAPs; therefore, Project HAP emissions would have an incremental, but minimal, impact on air quality in the vicinity of the Project Area.

Greenhouse Gas Emissions

GHGs for this EA include CO_2, CH_4, N_2O, hydro fluorocarbons, per fluorocarbons, and sulfur hexafluorides. GHG emissions from Project operations specifically include CO_2 from combustion emissions and potential CH_4 and N_2O emissions from propane combustion units. Each GHG has been assigned a global warming potential that relates to potential of the gas to trap heat in the atmosphere over a specified period of time. A relative contribution method has been established by the Intergovernmental Panel on Climate Change (IPCC) to estimate a total GHG weighted emission because the GHGs have various 100-year global warming potential. CO_2 has been established as the reference gas equivalent CO_2e with a GWP of one. The global warming potential equivalents for CH_4 and N_2O are 25 and 298, respectively. The GHG emission estimates for the Proposed Action's maximum realistic operational scenario are presented in **Table 4-4**.

TABLE 4-4 Proposed Project Realistic Maximum Greenhouse Gas Emissions			
Pollutants	**Emissions (tons/year)**	**GWP**	**Emissions (CO_2e)**
CO_2	28,900	1	28,900
CH_4	0.19	25	5
N_2O	0.31	298	92
Total CO_2 equivalent (metric tons)			**28,997**

Source: Enviroscientists 2013

The total Project CO_2e emissions of 28,997 metric tons per year is the global warming potential expected as a result of GHG emissions after the Project commences. The major portion of CO_2 GHG emissions are from fuel combustion. No GHG data exists for existing conditions at the proposed Project. For purposes of this analysis, a baseline of zero GHG emissions has been established for reference conditions.

The 2008 statewide inventory for Nevada projects that GHG emissions would increase from 34.1 million metric tons (MMt) CO_2e to 78.4 MMt CO_2e between 1990 and 2020 (NDEP 2008). GHG emissions from the proposed Project have a potential to introduce an additional 0.026 MMt CO_2e within the projected time frame. The amount of GHG emissions is less than one percent of the expected statewide GHG emissions and is considered minimal.

The latest EPA GHG inventory report of April 2012 summarizes that in 2010, U.S. GHG emissions totaled 6,821.8 MMt CO_2e which is a 3.2 percent increase from 2009 (EPA 2012). The latest emission trends developed from modeling efforts is described in detail in the Fourth U.S. Climate Action Report released in 2007 (U.S. Department of the State 2007). The Fourth U.S. Climate Action Report is part of an integrated approach to support the United Nations Framework Convention on Climate Change to address climate change on a global level.

Nationally, the CO_2 emissions as a result of fossil fuel combustion (energy emissions) are projected to increase by 17 percent to 6,447 MMt by the year 2020. For nonenergy CO_2 sources, emissions are expected to increase one MMt each year to 396 MMt by 2020. Energy based CO_2 emissions make up over 99 percent of the total proposed Project GHG emissions. The CO_2 emissions from the proposed Project are equivalent to 0.026 MMt. The contribution of the Project to the national projected CO_2 emissions would be less than one percent and is considered minimal.

The Project's impacts on global climate change are difficult to quantify, so the quantitative assessment of the impact that the Project would have on global climate change is addressed as it pertains to the role Nevada and the U.S. play in the release of GHGs. In near-term scenarios through both 2020 and 2030, the EPA and Department of Energy have projected global CO_2 emissions to increase from 25 MMt in 2003 to as high as 44,000 MMt in 2030 based upon the supply and demand prices of energy. The near-term scenarios for non CO_2/CO_2e GHG emissions are predicted to grow from 9,000 MMt in 1990 to 13,000 MMt in 2020. As previously stated, Nevada's statewide GHG emissions projection by the year 2020 of CO_2e is 78.4 MMt, which is a contribution of less than one percent to the global GHG emission projections. Therefore, the contribution of the state to the global projected CO_2e GHG emissions is considered minimal, which in turn, would result in negligible Project impacts to global GHG emissions.

4.1.2 No Action Alternative

As a result of the No Action Alternative, the existing and authorized operations at Florida Canyon Mine would continue under current conditions. There would be a temporary increase in emissions during reclamation for approximately 1.5 years. After reclamation concludes, air emissions would decrease. Air emissions from the existing operations would not be expected to increase over current levels. See Chapter 3.1 for a discussion of current emissions.

4.2 CULTURAL RESOURCES

4.2.1 Proposed Action

Under the Proposed Action, FCMI would expand the SWRSF and bury NRHP-eligible site CrNV-22-3345. Given the placement of the SWRSF, this site would be lost to mine expansion and cannot be avoided resulting in an adverse effect to that Historic Property.

4.2.1.1 BLM Recommended Mitigation

Per USC 470h-2(b), the BLM is required to develop a data recovery plan for NRHP-eligible properties that are adversely impacted by the proposed action. The Historic Properties Treatment Plan for this proposed action is currently under review by the SHPO.

Adverse effects to CrNV-22-3345 would be mitigated by archaeological data recovery following a Historic Properties Treatment Plan developed by BLM. This plan also would address NRHP-eligible site CrNV-02-11711 immediately adjacent to the southern portion of the proposed SWRSF diversion channel. The plan calls for avoidance by utilizing a 50-meter (ca. 162.5-foot) buffer zone and an archaeological monitoring program.

The Plan would be implemented through a Memorandum of Agreement between the BLM and SHPO. Similarly, if other NRHP-eligible sites or contributing elements are discovered within the Project Area during construction or other activities associated with the Proposed Action they would be mitigated through data recovery or avoidance measures approved by BLM in consultation with SHPO. Additional NEPA analysis would be required if additional treatments are necessary.

Sites remaining unevaluated for listing on the NRHP—CrNV-02-3342, -22-6319 and -02-11945—are located south of the proposed SWRSF expansion area and SWRSF diversion channel and would be avoided by Project-related activities as currently proposed. If the SWRSF expansion area or diversion channel designs change, FCMI would avoid the three unevaluated sites noted above, or a revised treatment plan (and additional NEPA analysis) would be developed to mitigate potential impacts to those cultural resources. These collective mitigations included as part of a treatment plan, once approved by BLM in consultation with the Nevada State Historic Preservation Office (SHPO), would minimize adverse effects on historic properties in the Project Area.

4.2.2 No Action Alternative

No impacts to cultural resources are anticipated under the No Action Alternative.

4.3 ENVIRONMENTAL JUSTICE

4.3.1 Proposed Action

Potential effects of the Proposed Action are not expected to create adverse effects for any particular population, nor would it specifically generate disproportionate impacts for minority or low-income populations located in the Environmental Justice Assessment Area (Assessment Area) given that poverty and minority metrics do not meet or exceed the thresholds discussed above in Chapter 3.3. Humboldt County's minority population and poverty rate are lower than the statewide average. The city of Winnemucca has lower poverty rates and similar minority population percentages as that of Humboldt County.

Poverty rates in Pershing County are 17.3 percent compared to 14.2 percent in Nevada, however poverty rates are similar (between 10-20 percent) to that reported in the 5-county Winnemucca District Office area (BLM 2013a). The minority population in Perishing County is generally lower compared to Nevada as a whole. Poverty rates are higher within the city of Lovelock when compared to the rest of the assessment area (Pershing County, Humboldt County and Winnemucca) and the state of Nevada as a whole; however, poverty rates are not above the 50 percent threshold nor are they meaningfully (10 percent) greater than the minority population percentage in the general population or appropriate unit of geographical analysis.

The American Indian populations in both Humboldt and Pershing Counties are higher than the statewide average but similar to the overall Winnemucca District 5-county planning area (BLM 2013a). Beyond this, the American Indian population of both Lovelock and Winnemucca are below the 50 percent threshold and neither are meaningfully (10 percent) greater than the American Indian population percentage in the general population of their respective counties.

As such, the Proposed Action would not have potential to generate disproportionately adverse impacts for low-income or minority populations located in the Assessment Area. There are no recommended mitigation measures for environmental justice.

4.3.2 No Action Alternative

Under the No Action Alternative, the work force at the mine is expected to remain the same and there would be no change in the need for public services. The No Action Alternative would not result in any additional impacts to environmental justice populations.

4.4 INVASIVE, NON-NATIVE SPECIES

4.4.1 Proposed Action

Disturbed sites and recently seeded areas have potential to be invaded and colonized by undesirable species such as noxious weeds including cheatgrass, medusahead, and other species adapted to exposed soil. Indirect impacts would include potential introduction of species from disturbed or reclaimed areas to undisturbed areas of native vegetation. Monitoring weed infestations are ongoing and would continue until reclamation is complete and the potential for weed invasion would be minimized. Noxious weed control measures associated with the Proposed Action would control weeds in the current and proposed mine disturbance areas and reduce the potential for these mine areas to be a source of noxious and invasive species for undisturbed adjacent areas.

4.4.2 No Action Alterative

The No Action Alternative would not result in additional land disturbance that would be prone to colonization by invasive species. Ongoing weed control programs at the Florida Canyon Mine would continue; however, adjacent rangeland areas with infestations of cheatgrass and medusahead would continue to reduce productivity of rangeland and increase risk of wild fire. Successful reclamation of the existing disturbance area would occur sooner, as compared to the Proposed Action, resulting in a vegetation community that would be less susceptible to weed invasion.

4.5 MIGRATORY BIRDS

4.5.1 Proposed Action

Twenty-six species of migratory birds have been recorded for the Project Area (AMEC 2014). Potential direct and indirect impacts to migratory birds would result from vegetation removal and other activities associated with the Proposed Action; especially if activities disrupt habitats in the nesting and brood-rearing period. The Proposed Action would remove 675 acres of salt-desert shrub habitat, 70 acres of the big sagebrush/Utah juniper community, and 216 acres of areas previously reclaimed. These foraging and breeding habitats are common and widespread in Nevada and Great Basin and loss of these areas as a consequence of the Proposed Action would have a negligible effect on species which nest in the area (e.g., western meadowlark, horned lark, black-throated sparrow, and rock wren), if construction of mine and ancillary facilities were to take place outside of the nesting and brood-rearing period. Raptors that forage over the Project Area would experience a reduced prey base due to a reduction in habitats that support small mammals and insects. Following mining, successful reclamation would provide prey for raptors. Destruction of nests of migratory birds would conflict with the Migratory Bird Treaty Act. Implementation of environmental protection measures such as those included in Chapter 2.1.11, would reduce potential impacts to migratory birds.

4.5.2 No Action Alterative

The No Action Alternative would not affect populations of migratory birds in the Project Area.

4.6 NATIVE AMERICAN RELIGOUS CONCERNS

4.6.1 Proposed Action

No impacts to Native American Religious Concerns were identified through official consultation.

4.6.2 No Action Alternative

No changes would be made to existing and authorized activities at the Florida Canyon Mine under the No Action Alternative. No impacts to Native American Religious Concerns are anticipated.

4.7 WATER QUALITY (SUFACE WATER/GROUNDWATER)

4.7.1 Proposed Action

The assessment area for potential impacts to water resources is the Hydrologic Assessment Area illustrated on **Figure 3-8**.

FCMI conducted a rock characterization program to assess the potential for release of trace elements from waste rock and ore that would be mined under the Proposed Action and exposed to oxygen and precipitation (ASW 2013). Mineralization within the Florida Canyon Mine is hosted entirely within the Triassic-age Grass Valley Formation, which outcrops on the northwestern flank of the Humboldt Range. The Grass Valley Formation is a fine-grained siltstone metamorphosed to slate or phyllite with interfingerings of fine sandstone. Four major alteration types (silicic, hematitic, clay, and hornfels) can be identified visually within the mineralized zone currently being mined (FCMI 2013).

Results of the rock characterization study indicate that approximately 1 percent of the waste rock to be mined in the Phase 7 expansion would be sulfidic (approximately 376,000 tons) with the remaining 99 percent classified as oxide waste rock (approximately 37.5Mt). As described in Chapter 2, sulfidic waste rock would be encapsulated within oxide waste rock to limit the exposure of potentially acid producing waste rock to oxygen and precipitation. The oxide waste rock testing indicates the bulk of the waste rock exhibits net acid neutralizing capacity and as such, would have limited ability to generate acid rock drainage conditions.

Other mine process components including the SHLP and associated process ponds are to be designed, operated, decommissioned and reclaimed to contain mine process solution as presented in Chapters 2.1.4 and 2.2.5.

As described in Chapter 1.2.5, surface water management consisting of run-off diversion and run-on control (collection ditch system and sediment ponds) is constructed and operated in accordance with FCMI's approved SWPPP administered by NDEP. Groundwater management consisting of groundwater production and groundwater contaminant corrective actions is constructed and operated in accordance with appropriation permits administered by NDWR and the Florida Canyon Mine WPC Permit administered by NDEP.

Active monitoring of groundwater and surface water is described in Chapter 1.2.6, including storm water, mine water supply wells, groundwater monitoring wells, process solutions, leak detection systems, and solution recovery systems, by FCMI at the mine site. BMPs including silt fences, water bars, ditches, and sediment ponds are employed to control surface erosion and sediment from disturbed areas.

Mining operations at the Florida Canyon Mine would not require dewatering to maintain dry pit conditions. As discussed in Chapter 2.1.2, the proposed Phase 7 Pit would be mined to a depth approximately 25 ft. above the groundwater elevation as presented in **Figure 2-3**, thereby not requiring a dewatering program. Consequently, no pit lake would form in the proposed Phase 7 pit.

The Proposed Action would have no potential direct or indirect impact of surface water or groundwater resources in the Project Area. Implementation of water resource management plans including the WPC Permit and SWPPP, would result in mine contact water being managed and contained onsite.

4.7.2 No Action Alternative

Under the No Action Alternative, current permitted mining activities under APO #18, and ultimately reclamation activities, would continue. Water use on the heap leach pad would decrease when reclamation activities commence. Reclamation of the heap leach pad would

include soil cover installation. Impacts to water quality under this alternative would be somewhat less than what might be anticipated under the Proposed Action.

4.8 ECONOMICS AND SOCIAL VALUES

4.8.1 Proposed Action

Additional temporary construction-related employment is anticipated as part of developing the proposed SHLP. The proposed SHLP would be constructed in three phases. Phase 1 would require estimated 35-40 temporary construction workers over a 4-month timeframe. The next two construction phases (Phase 2 and 3) to reach full design capacity of the leach pad would each require approximately 30 temporary construction workers over a 4-month timeframe.

It is likely that many of the temporary construction workers required for construction phases already reside in the assessment area (Winnemucca or Lovelock areas) and as such, there would be little effect on housing and public services. Even if a small short-term (4 month) influx of construction workers were to occur, housing vacancy rates in Pershing and Humboldt Counties would be adequate to address demand. A temporary positive effect on employment and income is expected over each of these 4-month timeframes.

The operational work force at the Florida Canyon Mine is expected to increase from the current total of 163 employees up to approximately 187 employees for an additional 8+ years of operation. Many of these 24 additional (operational) mine employees likely reside in Winnemucca or Lovelock areas already; therefore, little change in the work force that would affect housing and the need for additional public services is anticipated. A temporary positive effect on mine-related employment and income would occur over the 8 year timeframe for both current and additional employees, including both direct and indirect (and induced) effects on employment and expenditures in the mining industry.

For purposes of this analysis, an estimated range of employment and income effects was developed for consideration based on two studies:

- An input-output (IMPLAN) model cited by Ciciliano et al. (2008) for the hard rock mining sector in the Elko Micropolitan Statistical Area. This study used an employment multiplier of approximately 1.86; creation of an additional 0.86 jobs for every direct hard rock mining job, and an income multiplier of 1.37; a value of $0.37 earned by those jobs for every $1.00 earned by mine workers; and
- A more recent IMPLAN modeling effort conducted on behalf of the Nevada Mining Association (Applied Analysis) which estimated the 2011 Nevada mining industry had an employment multiplier of 2.33; creation of an additional 1.33 jobs for every direct hard rock mining job and a wage and salary multiplier of 1.62; translating into a value of $0.62 earned by those jobs for every $1.00 earned by mine workers.

Direct impacts resulting from additional employment attributable to the Project (163 current and 24 additional jobs) over an 8-year Project life (associated with the Proposed Action) would translate into additional labor income of approximately $16 million annually, based on 2010 average wages for metal mining workers (Dobra 2010). Indirect and induced impacts from secondary employment (using a multiplier range of 1.86 to 2.33) would maintain or create approximately 158 to 248 jobs in the general area generating a range of $5 to $13.2 million in average annual income from those jobs over this Project life. Net mineral proceeds, property

and sales and use taxes would also increase based on additional production over this 8-year timeframe.

No recommended mitigation measures have been identified for economics and social values.

4.8.2 No Action Alternative

Under the No Action Alternative, no temporary construction employment would be required and the existing work force (163 jobs) at the mine would not be extended over an additional 8-year life-of-mine. Since most of the current and anticipated work force for the Proposed Action would come from the existing mine-related work force in the area, impacts associated with the No Action Alternative would include increased unemployment locally (loss of 163 jobs). This would result in reduced wages and income spent locally due to direct, indirect and induced impacts from the loss in jobs at Florida Canyon Mine, which would translate into an increase in the need for public assistance. For estimation purposes, direct wage loss associate with these 163 jobs could total more than $14 Million per year based on the statewide average mining wage of $85,907 (Dobra 2010). The No Action Alternative would also translate into decreased local and state revenues from taxes, including the annual loss of approximately $515,000 in Net Proceeds of Minerals (NPM) tax to Pershing County (based on 2012 figures). Potential impacts under the No Action Alternative would be similar to potential impacts at the end of mine life under the proposed action, just occurring approximately 8 years sooner.

4.9 HISTORIC TRAILS

4.9.1 Proposed Action

Important visual resources that could be affected by the Proposed Action are defined for the Assessment Area as key observation points.

To assess the degree of visual contrast or character modifications that would result from the Proposed Action, three KOP's were selected from where changes to the area's characteristic landscape could be compared. The KOP's were chosen from different vantage points to the west of Interstate 80 along the historic California Emigrant Trail corridor to assess the change to the historical view shed. A map of the location of the KOPs is presented in **Figure 3-4**.

KOP 1- located west of Interstate 80, southwest of the Project Area. From KOP 1, views of the mine extend to the northeast and east. The mine lies in the foreground viewing zone.

KOP 2 - located west of Interstate 80 and west of the Project Area. From this KOP, the mine lies approximately due east in the foreground and middle ground viewing zone.

KOP 3 - located west of Interstate 80 northwest of the Project Area. The mine is in the foreground viewing zone and some of the mine's features are seen as skyline.

Photographic visual simulations have been prepared as a means for disclosing current mining operations and the Proposed Action APO #20 amendments. The visual simulations figures showing results of the proposed expansions of the Phase 7 Pit, SHLP, expansion of the SWRSF, and the South Carbon Tower are presented in **Figures 3-5, 3-6** and **3-7** for KOP 1, KOP 2 and KOP 3, respectively. The upper-most photographic panorama in each simulation figure, entitled "Existing - Post Reclamation Scenario," represents the AP0 #18 (2004) post-reclamation visual condition. The simulated Proposed Action post mining and post -reclamation visual conditions are represented by the middle and lower photographic panoramas in each simulation figure.

The contrast created by the SWRSF, SHLP and South Carbon Column would be visible from all three KOPs. Minor effects to foreground visual resources would occur during mining activities of the Proposed Action. Minor effect to the background skyline view to the south would occur as viewed from KOP3. The raised mounded form of the SWRSF and SHLP would result in visual effects creating a temporary minor contrast to the immediate foreground horizontal to rolling land form, and the smooth textured vivid red to brown coloring would contrast to the fine to medium textured green/tan existing in the immediate foreground. The added structure of the South Carbon Column cylindrical tanks would create a temporary minor contrast to the immediate foreground. The form, texture, color and structures of the Proposed Action would be similar to the existing mine landscape elements to the north. Sedimentation ponds and other ancillary elements would not be visible from the KOPs. Visual impact of the Proposed Action is anticipated to be minimal when viewed in the context of the existing mine elements adjacent to the north and would not be expected to attract the attention of the casual observer nor would the casual observer be expected to recognize expansion of an existing use.

The Non-Contact Storm Water Channel and ancillary disturbance on either side of the channel would be visible from KOP1 during construction. The channel is anticipated to be constructed entirely within the first 18 months and additional surface disturbance would not be necessary after construction. Disturbed areas would be reclaimed and revegetated within 2 years of disturbance. Visual effect is considered negligible. Construction of the SHLP would obscure views of the vivid red to brown contrasting coloring of the pit walls in the middle ground from KOP1 providing long term mitigation of the view of pit excavation walls.

Phase 7 Pit expansion would be visible in the middle ground from KOP 2 upon excavation of the existing South Waste Rock Storage Facility. The view would be visible for a short distance in between the existing heap leach pad and the proposed SHLP. The vivid red to brown coloring would conform to the adjacent vivid colors of the existing pit, contrast is anticipated to be minimal when viewed in the context of the adjacent existing mine elements and would not be expected to attract the attention of the casual observer. The visual effects of the Proposed Action from KOP1 and KOP2 would last for approximately 8-10 years. The view shed was previously affected by other disturbances prior to the trails guidelines. Long term Post Reclamation visual effects would be minimized by successful reclamation and revegetation from all KOPs with exception of a minor visual effect to the background skyline to the south as viewed from KOP3.

4.9.2 No Action Alternative

Under the No Action Alternative permitted mining activities associated with APO #18 (2004) would continue to occur. Existing permitted operations are authorized for approximately 2,054.7 acres of disturbance. Actual to date disturbance comprises approximately 1,014.5 acres. Currently permitted activities (APO #18) would result in minor visual effects to visual elements of form and color. With concurrent reclamation of retired disturbances long term visual effects would be minimized. Visual effects of the No Action Alternative would be similar to the Proposed Action but proportionately less.

4.10 NOISE

4.10.1 Proposed Action

Few noise receptors are located within the vicinity of the Project Area. The nearest noise receptors are residences of the Humboldt House; approximately 1 mile from the Florida Canyon

Mine. The proposed Project would extend the life of the mine, during which time sensitive receptors would experience mine-related noises throughout the day and night. Sound levels from mining activities would include blasting within the Proposed Phase 7 pit during daylight hours and construction/mining equipment operating 24 hours per day.

To comply with the Mining Safety and Health Administration (MSHA) Occupational Noise Exposure Standard, FCMI has conducted periodic noise level readings at the crusher at the Standard Mine. The same crusher would be used for the proposed Project. Noise dosimeters, worn by employees working near the crusher performing tasks such as cleaning belts or the crusher jaw, record personal exposures to noise, as presented below in **Table 4-5** (L. Szabo, personal communication May 5, 2014). These levels remain below MSHA's exposure "Action Level", which is an 8-hour time-weighted average sound level of 85 dBA (MSHA, 2000).

TABLE 4-5 Crusher Levels at Standard Mine

Date of Reading	Noise Dosimeter 1 Reading, decibels	Noise Dosimeter 2 Reading, decibels
7/6/11	75.4	76.4
8/24/11	61.2	66.1
8/1/12	69.4	76.6
8/22/12	72.3	84.6
9/5/12	72.5	79.5
6/11/13	71.3	78.3
6/11/13	68.2	72.3

The rate at which noise attenuates, or decreases, in outdoor settings is dependent on several factors, including atmospheric conditions, terrain, and the physical distance separating the noise source from the noise receptor. The distance separating a noise source and noise receptor alone would result in some degree of noise attenuation. Generally when noise is emitted from a point source, the noise is attenuated an average of six (6) dB each time the separating distance is doubled. Widely distributed noise, such as the proposed mining operations would be expected to attenuate at a lower rate. The effect of multiple noise sources is not a simple addition, but rather a logarithm. For example, if two identical and adjacent sources each produce a noise level of 65 dBA at 50 feet from the source, the total noise produced by both sources would be 68 dBA at 50 feet.

Operations-related noises from the Project would be similar to those associated with existing mining and ore processing operations at the Florida Canyon Mine. Given that the mine development under the Proposed Action would increase the distance between the primary sources of noise (crusher facility and haul truck traffic) and the nearest sensitive receptor, the levels of noise would not exceed EPA guidelines nor are they expected to be in widespread annoyance or complaints.

4.10.2 No Action Alternative

Under the No Action Alternative noise producing activities that are authorized under APO #18 would continue to occur. During reclamation noise levels may increase temporarily due to heavy equipment used in the reclamation process. Once reclamation is complete (approximately in 18 months) noise levels will decrease.

4.11 PALEONTOLGY

4.11.1 Proposed Action

The classifications for potential for significant vertebrate paleontological resources in the Project Area ranges from Class I to Class 4, with the disturbance associated with the Proposed Action confined to Class 2 and Class 3a. As such, based on these classifications (discussed in detail below), the potential for the Project to impact a significant fossil locality is low. If paleontological resources are found during operations, impacts could be mitigated through avoidance and/or data recovery.

Determination of Paleontological Resource Potential for Geologic Units within the Project Area

In accordance with BLM guidelines (2008), the PFYC system was used to assess paleontological sensitivity and the level of effort required to manage potential impacts to significant resources. Using this system, the sensitivity of geologic units is assigned on the basis of the relative abundance and risk of adverse impacts to vertebrate fossils and significant invertebrates and plants. The area of sensitivity is typically defined as the entire rock formation and is not limited to areas where surface fossils may be exposed. The sensitivity of a geologic unit can be assigned to one of five classes, ranging from very low to very high potential for fossilized remains. These categories are briefly summarized below:

Class 1 – Very Low Potential Geologic units are not likely to contain recognizable fossil remains. Examples of these units include igneous or metamorphic rocks, or those that are Precambrian in age or older.

Class 2 – Low Potential Sedimentary units are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils.

Class 3 – Moderate or Unknown Potential

Class 3a – Moderate Potential Units are known to contain vertebrate fossils or scientifically significant nonvertebrate fossils, but the occurrences are widely scattered. Common invertebrate or plant fossils may be found in the area, and opportunities may exist for hobby collecting. The potential for a project to be sited on or impact a significant fossil locality is low, but is somewhat higher for common fossils.

Class 3b – Unknown Potential Units exhibit geologic features and preservational conditions that suggest significant fossils could be present, but the unit or area is poorly studied and field surveys may uncover significant finds. The units may eventually be placed in another Class when sufficient data are collected.

Class 4 – High Geologic units contain a high occurrence of significant fossils. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. Surface disturbances may adversely affect paleontological resources.

Class 5 – Very High Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils, and that are at risk of human-caused adverse impacts or natural degradation.

Based on review of local and regional geology and paleontology resources, as well as private reports and discussions with mine personnel, the following determinations were made:

- Intermittent vertebrate fossils are known to occur within Quaternary deposits throughout Pershing County and have been reported in the vicinity of the Project Area. Therefore, these units (Qa and Ql) likely have a moderate potential (PFYC Class 3a) to encounter vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils.
- There is no evidence of vertebrate fossil preservation within the Grass Valley Formation; therefore it is determined to have a low fossil potential (PFYC Class 2).
- The Natchez Pass Formation is known to contain abundant invertebrate fossils and a single vertebrate, however, the predictability is low; therefore, this unit has a low potential (PFYC Class 2) to encounter vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils.
- The Prida Formation has yielded abundant vertebrate fossils, therefore, this unit is determined to have a high fossil potential (PFYC Class 4). The Prida Formation is not anticipated to be encountered during the Proposed Action.
- The Rochester Rhyolite, exposed in the extreme eastern portion of the Project Area, has a very low fossil potential (PFYC Class 1) to encounter vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils due to the nature of its formation.

The likelihood of encountering vertebrate fossils in all geologic units, with the exemption of the Quaternary deposits, is low. However, if paleontological resources are encountered, the procedures as presented in the environmental protection measures Chapter 2.1.11 would be implemented to avoid any potential impacts. As stated in the PRPA, collection of paleontological resources requires a permit issued by the appropriate Federal agency (casual collecting excepted). Any paleontological resource, and any data or records associated with the resource collected under a permit, must be deposited in an approved repository.

4.11.2 No Action Alternative

Under the No Action Alternative, impacts to paleontological resources would be similar to, but proportionally less than, the Proposed Action.

4.12 PUBLIC ACCESS

4.12.1 Proposed Action

Existing access to two public roads would be modified by the proposed Project including current access to Foothill Road and Johnson Canyon Road. The locations of the proposed expansion of the SWRSF, Proposed SHLP and the Non-Contact South Diversion Channel would require rerouting portions of Johnson Canyon Road and Foothill Road within Sections 3, 4, 10, 11, 14 and 15 of T31N, R33E. Specifically, FCMI plans to construct a South Haul Road and South Major Access Road on private and public lands to the south of planned facilities (See **Figure 2-1**). Existing access points to/from the Interstate 80 Frontage Road in Section 4 of T31N, R33E would be fenced to provide mine-related access via these routes.

To avoid disruption of public access, FMCI would re-route the existing access to Johnson Canyon to the south through Black Canyon Road. The access point to Black Canyon Road is located in Section 16 of T31N, R33E approximately 1.5 miles south of the existing access point for Johnson Canyon Road/Foothill Road in Section 4 of T31N, R33E. A small spur in Section 14 (T31N, R33E) east of a fence line would allow for continued public access into Johnson Canyon from the south along Black Canyon Road.

Existing access to Black Canyon in Sections 14 and 15 of T31N, R33E would not be affected. Public access would also be maintained along the Frontage Road south to the Standard Mine.

Building of the new road would occur prior to mine expansion (during which time access could continue to be provided on the existing road) in order to allow uninterrupted public access. As such, the Proposed Action would not have potential to generate adverse impacts related to public access through the Project Area. No monitoring or mitigation measures would be required.

4.12.2 No Action Alternative

Under the No Action Alternative, additional disturbance to lands within the Project Area would not occur. Existing public access to undeveloped portions of the Project Area and the range would be retained and there is no need for new public access. Accordingly, the No Action Alternative would not result in any impacts to access.

4.13 RANGELAND MANAGEMENT

4.13.1 Proposed Action

Under the Proposed Action approximately 605.3 public acres outside of the existing rangeland fence would be enclosed by a new rangeland improvement fence. The new rangeland improvement fence would be constructed south of the existing rangeland fence. No new water developments for livestock would be constructed.

Approximately 2.5 percent of the total BLM-managed grazing acres within the Humboldt House allotment would be affected by the Proposed Action. This small decrease in acreage is not anticipated to decrease the total AUMs supported by the Humboldt House allotment. As such, the Proposed Action would not generate adverse impacts related to rangeland management in the Project Area.

4.13.2 No Action Alternative

Under the No Action Alternative no new rangeland improvements (i.e., fence) would be constructed.

4.14 SOIL

4.14.1 Proposed Action

The Proposed Action includes removal of approximately 550 acres of vegetative cover and soil material through earth-moving activities such as grading and excavation. Vegetation removal and ground disturbance would leave soil exposed to wind and water; however, exposed areas would be built over with the proposed SHLP, SWRSF, process ponds and other operational facilities, and erosion would be mitigated through the use of BMPs.

Impacts to soils related to erosion would occur under the Proposed Action. These impacts would last until reclamation and re-vegetation are complete. The accidental release of petroleum products and equipment maintenance products onto the ground surface could affect soil resources. Impacts to soils related to waste spills would be unlikely. If a spill did occur the impact would be small in scope and would be handled according to approved plans.

In order to ensure erosion and soil loss are minimized, FCMI would implement environmental protection measures described in Chapter 2.1.11. Disturbances would be reclaimed as described in Chapter 2.2. The reclaimed areas would be planted with a BLM approved seed mix. Soils stockpiled for future use would be temporarily vegetated. Once established, the vegetation would hold surface soil intact and would decrease the likelihood of erosion.

4.14.2 No Action Alternative

Under the No Action Alternative, permitted activities would continue to occur. Impacts to soil as a result of the No Action Alternative would be less than the Proposed Action.

4.15 SPECIAL STATUS SPECIES

4.15.1 Proposed Action

Plants

The Proposed Action would result in loss of habitat and individuals of two species of sensitive plants present in the Project Area; the sand cholla and Lahontan beardtongue. The sand cholla is known from three locations (six individual plants) in the Project Area and the proposed heap leach pad and waste rock storage facility would remove two of these sites. The remaining site would be about 2,000 ft. from the disturbed areas. Based on historic data from NNHP's 2001 estimated range calculations, the sand cholla's Nevada range extends across more than 129,000 acres (NNHP 2001a). This range calculation was based on 14 occurrences in 9 counties. Based on more recent NNHP data, the sand cholla is known from 37 locations in 13 counties of Nevada (NNHP 2002) so it is likely that the range is larger than currently mapped. The Proposed Action (1,288 acres) would constitute a small fraction of this overall range. It is likely that the removal of the two sites would have a negligible effect on the overall occurrence of sand cholla within the state of Nevada.

The Lahontan beardtongue is known from five locations (15 individual plants) in the Project Area and the proposed heap leach pad and waste rock storage facility would destroy four of these locations. The remaining location could be destroyed by construction of the proposed diversion channel. Based on 2001 NNHP range map data, the Lahontan beardtongue's Nevada range extends across more than 24,000 acres (NNHP 2001b). This range calculation was based on four occurrences within three counties. Based on current NNHP data, the Lahontan beardtongue is now known from 18 locations in four counties in Nevada (Nye, White Pine, Pershing, and Churchill) (NNHP 2007), so it is likely that the range is larger than currently mapped. The Proposed Action (1,288 acres) would constitute a small fraction of this overall range. It is likely that the removal of the five sites would have a negligible effect on the overall occurrence of Lahontan beardtongue within the state of Nevada.

The Proposed Action could extirpate the local population of Lahontan beardtongue (*Penstemon palmeri var. macranthus*), which may be at risk from hybridization with the Palmer penstemon (*Penstemon palmeri var. palmeri*) seeded on areas reclaimed after past mining activities at

Florida Canyon. Proposed expansion of the mine pit (Phase 7) would remove the reclaimed area and Palmer penstemon growing on the site, reducing the risk of hybridization with native population of Lahontan beardtongue. Removing seeds of Palmer penstemon from the reclamation seed mix also would reduce the risk of Palmer penstemon hybridizing with Lahontan beardtongue.

4.15.1.1 BLM Recommended Mitigation

Potential measures that could be taken to avoid extirpating the Lahontan beardtongue on the proposed expansion area would be to transplant individuals that would be destroyed by the Proposed Action to adjacent undisturbed habitats. Transplanting would need to be done when the plants are dormant and would require excavation of entire root systems and associated soil for transplanting to have a reasonable likelihood of success. Collecting seed from local plants and propagating plants in the nursery for out-planting to suitable undisturbed adjacent sites would also reduce the risk of extirpating the local population. Similar measures could be taken to reduce the risk of extirpation for the population of sand cholla in the Project Area. Removing seeds of Palmer penstemon from the reclamation seed mix also would reduce the risk of Palmer penstemon hybridizing with Lahontan beardtongue.

Wildlife

Sensitive species documented in the Project Area and would likely be affected by removal of habitat or displacement include the golden eagle, ferruginous hawk, Swainson's hawk, northern goshawk, Preble's shrew, dark kangaroo mouse, Brewer's sparrow, loggerhead shrike, and 12 species of bats (**Table 3-13**). Removal of 70 acres of sagebrush habitat as part of the Proposed Action would reduce habitat for the Brewer's sparrow, a species obligately associated with big sagebrush habitats throughout the western United States. The relatively small amount of sagebrush habitat removed with the Proposed Action would not affect this species as the affected habitat is common in Nevada and widespread throughout the Great Basin surrounding the Project Area.

The Proposed Action would remove foraging habitat for the golden eagle, ferruginous hawk, Swainson's hawk, and northern goshawk, but no known nest sites would be directly affected. The proposed Project would expand the area of disturbance and noise from the existing mine footprint, which could displace these raptor species from undisturbed habitat near the expanded mine facilities. These species typically forage over large areas and the direct loss of habitat and displacement from habitat near the expanded mine facilities would be a negligible reduction in a regional context and would not likely affect population density or viability. The presence of the existing mine and ancillary facilities has probably habituated the birds that forage in the vicinity of the mine to human disturbances and noise associated with mining. The Proposed Action would be a relatively small expansion of the level of disturbance and would not differ in magnitude of noise and activity from the past levels associated with mining at Florida Canyon.

Golden eagles nest in the Humboldt Range, with the closest nests (inactive in 2013) approximately two miles from the Proposed Action. It is unlikely that the proposed mine expansion would affect the use of these nests. The recommended buffer to protect golden eagle nests from disturbance is 0.5 miles (Romin and Muck 1999). It is likely that golden eagle nests in the Humboldt Range are sufficiently far removed from the proposed expansion to avoid displacement from mine-related activities. The upper elevations of the existing mine pit are

closer to the nests than the proposed mine expansion areas, indicating that past mining activities have not appeared to preclude nesting at moderate distances from mining activity.

Although not documented for the Project Area, suitable habitat is present for the dark kangaroo mouse and Preble's shrew. The Proposed Action would remove 901 acres (63 percent) of habitat for the dark kangaroo mouse and 738 acres (52 percent) of habitat for the Preble's shrew. If individuals of these species are present in disturbed habitats, it is likely that they would be killed by construction activities. Population status and distribution of these small mammals is not well known; however, the types of habitat that would be destroyed with the Proposed Action are widespread in Nevada and the Great Basin as a whole. For instance, based on calculations derived from Hafner and Upham 2011, the dark kangaroo mouse distribution is estimated to extend over 32.5 million acres across Nevada. The Proposed Action (1,288 acres) would constitute a minute fraction of this overall range. Similarly, based on calculations derived from the estimated Nevada range of the Preble's Shrew (NatureServe 2014), the Preble's Shrew range is estimated to extend over northern Nevada including portions of Elko, Humboldt and Washoe Counties (13.6 million acres). Moreover, Ports and George (1990) report that studies in Elko County, Nevada suggest that this shrew may be more common and widespread in the northern Great Basin than previously supposed. The Proposed Action (1,288 acres) would constitute a minute fraction of this range as well. It is likely that the incremental loss of habitat and potential for mortality from the Proposed Action would have a negligible effect on the populations of these small mammals regionally and over their range of occurrence. However, in order to offset potential impacts to the sensitive dark kangaroo mouse and Preble's shrew FCMI would implement the environmental protection measures presented in Chapter 2.1.11

The greater sage-grouse has not been detected in the Project Area and habitat for this sagebrush-obligate species appears to be marginal because of the fragmented nature of the habitat, presence of junipers, and relatively steep slopes. In addition, based on NDOW's greater sage-grouse Habitat Categorization Map, no PPH or PGH exists in the Assessment Area. Approximately 264 acres along the easternmost boundary of the Assessment Area are classified as "Low Value Habitat and Transitional Range" (Category 4). The Proposed Action would remove 70 acres of sagebrush/Utah juniper habitat. The loss of this relatively small amount of this low value/transitional habitat would not likely affect sage-grouse.

Twelve sensitive bat species have been recorded to utilize habitat in the proposed expansion area. These bats forage over the proposed Project Area and do not seem to preferentially utilize specific habitat features (AMEC 2014). No hibernacula or nursery habitats are known in the Project Area. The loss of foraging habitat with the Proposed Action would have a negligible effect on bat species as the habitats that would be affected are widespread in the region and Nevada.

4.15.2 No Action Alterative

The No Action Alternative would not affect special-status animal species in the Project Area. The presence of Palmer penstemon on reclaimed areas would continue to pose a risk to Lahontan beardtongue from potential hybridization.

4.16 VEGETATION

4.16.1 Proposed Action

Direct and indirect impacts to vegetation would occur from construction of the proposed expansion of mine facilities. Construction of mine and ancillary facilities would remove 675 acres of salt desert shrub, 70 acres of big sagebrush/Utah juniper, and 216 acres of reclaimed land. Dust from roads and mining activities could coat vegetation in areas adjacent to or downwind from dust sources. Dust on vegetation would weaken some species and predispose them to insect infestation. Control of fugitive dust on haul and access roads through the use of water and chemical binders would reduce the amount of dust that would settle on vegetation.

Following mining, proposed disturbances including roads, heap leach facility and waste rock disposal facility would be reclaimed to attain the desired plant community to support wildlife. Growth media and seeding would not occur within the pit (469 acres) and would therefore, remain unvegetated. Concurrent reclamation during and after mining would likely reestablish permanent and stable vegetation cover within five to ten years; assuming that livestock use of the area is deferred and noxious weeds are controlled. It is unlikely that sagebrush would be reestablished on reclaimed areas and communities of big sagebrush have proven difficult to reestablish on reclaimed land (Vicklund et al 2004). Reclaimed plant communities would likely differ in species composition from native pre-mining communities. Grasses with low densities of forbs and shrubs would dominate reclaimed areas.

4.16.2 No Action Alterative

The No Action Alternative would not result in the additional removal of vegetation for mine construction. Implementation of the current approved reclamation plan for the Florida Canyon Mine would result in establishment of vegetation on those areas to be seeded. Weather, especially drought, livestock grazing, and wildfire would continue to modify plant communities in terms of canopy structure and species diversity.

4.17 VISUAL RESOURCES

4.17.1 Proposed Action

Visual impacts have been analyzed in accordance with standard BLM VRM contrast rating principles (BLM, 1986). The systematic contrast rating process (BLM H-8431-1) is used to identify the nature and degree of visible modification to the landscape that would occur as a result of the Proposed Action. The contrast rating involves comparing the proposed project features with the major features in the existing landscape using basic design elements of form, line, color and texture. The degree of contrast is rated and compared to the management objectives established for the VRM Class II to determine the level of impact or compatibility or required mitigation.

FCMI would implement the environmental protection measures described in Chapter 2.1.11 to reduce impacts to vegetation which in turn influences visual resources. Lighting impacts would also be minimized through the implementation of the environmental protection measures listed in Chapter 2.1.11. These measures include limiting lighting to where needed for safe operations and shielding or directing lights to the immediate work area.

The Phase 7 Pit viewshed analysis is presented on **Figure 4-2.** Visual effects resulting from implementation of the Proposed Action are anticipated to be minimal and are in conformance with VRM Class II objectives.

4.17.2 No Action Alterative

Under the No Action Alternative permitted mining activities associated with APO #18 (2004) would continue to occur. Existing permitted operations are authorized for approximately 2,054.7 acres of disturbance. Actual to date disturbance comprises approximately 1,014.5 acres. Currently permitted activities (APO #18) would result in minor visual effects to visual elements of form and color. With concurrent reclamation of retired disturbances long term visual effects would be minimized. Visual effects of the No Action Alternative would be similar to the Proposed Action but proportionately less.

4.18 WILDLIFE

4.18.1 Proposed Action

Potential direct and indirect impacts to wildlife would result from removal of 961 acres of habitat. Loss of habitat would reduce local availability of forage, security, and breeding cover for wildlife inhabiting the area. Species dependent on these disturbed sites would be killed or displaced. Displaced animals may be incorporated into adjacent populations, depending on variables such as species behavior, density, and habitat quality. Adjacent populations may experience increased mortality, decreased reproductive rates, or other responses resulting from competition with displaced individuals. The extent of habitat loss due to displacement varies among species and individuals; therefore, it is speculative to predict this loss because of variability of responses among species and individuals. Although a common wildlife response to noise and human presence is displacement, some animals become acclimated to noise, traffic, and other human activities and occupy habitat affected by mine-related disturbance.

Species such as mule deer, pronghorn antelope, bighorn sheep, and coyote have relatively large home ranges. The Project Area represents a relatively small part of the ranges of these species. The loss of 961 acres of habitat would not affect local and regional populations.

The Proposed Action and existing mine disturbance could inhibit movement of pronghorn and mule deer by forming a barrier between Interstate 80 and the steep topography of the Humboldt Range. Fences and other barriers such as ditches impede movements of pronghorns including migration (Sprague et al 2013). Movement of pronghorns and mule deer is impeded by fences along the Interstate 80 and mine site and by steep topography of the Humboldt Range. Inhibition of movement could render suitable habitat unavailable to the migratory and wide-ranging pronghorn.

Small mammals, lizards, snakes, and insects would be killed by construction activities and vehicle traffic. Often lizards, snakes, and small mammals seek cover underground and removal of soil and rock would result in direct mortality. Common small mammals that would experience increased mortality risk include the Great Basin pocket mouse, deer mouse, northern grasshopper mouse, western harvest mouse, and chisel-toothed kangaroo rat. Reptiles that would experience increased mortality risk include: long-nosed leopard lizard, desert horned lizard, side-blotched lizard, western whiptail, Great Basin collared lizard, and Great Basin rattlesnake.

Other species such as small mammals can rapidly colonize reclaimed land, often within one to two years (Hingten and Clark 1984); however, the potential for small mammals to colonize reclaimed areas depends on the diversity and cover of vegetation and proximity to undisturbed habitats that would provide a source for populations of small mammals (Larken et al 2008). Approximately, 469 acres (253 acres of existing pit and 216 acres of reclaimed habitat that would be mined) of habitat would remain as open pit, resulting in a long-term loss of potential habitat for wildlife species that rely on diverse plant communities for food and cover.

4.18.2 No Action Alterative

The No Action Alternative would not affect populations of wildlife in the Project Area beyond the indirect effects created by existing mining operations. Closure and reclamation of the Florida Canyon Mine in accordance with approved plans would restore habitat for wildlife. Existing conditions such as weather, habitat, and predation would continue to influence population density in the Project Area.

4.19 CUMULATIVE IMPACTS ANALYSIS

This section describes the cumulative effects that could result from potential impacts of the Proposed Action and the No Action Alternative, when combined with past, present, and reasonably foreseeable future activities (RFFA) in the vicinity of the Florida Canyon Mine. In the following subsection, Project Area refers to land associated with the Proposed Action located within the Proposed Plan of Operations Boundary APO #20.

The Council on Environmental Quality (CEQ) defines cumulative impact as:

"…the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (1508.7)."

4.19.1 Assumptions for Cumulative Effects Analysis

Based on the analysis presented earlier in Chapter 4 – Direct and Indirect Impacts, no direct or indirect impacts on the environment have been identified for the following resources or resource uses:

- Supplemental Authority Elements
  - Environmental Justice,
  - Native American Religious Concerns,
  - Waste, Hazardous or Solid
- Additional Resources
  - Historic Trails
  - Noise
  - Paleontology
  - Public Access
  - Rangeland Management
  - Realty
  - Recreation
  - Visual Resources

- Water Quantity

Consequently, no cumulative effects have been identified for these resources.

The cumulative effects analysis included in this section is based on the Proposed Action which would result in mining over an eight to ten year period followed by two to three years of reclamation activity (See Chapter 2.1). Conservatively, cumulative or additive impacts (through reclamation) are described for reasonably foreseeable future actions for 13 years (i.e., through year 2027).

4.19.2 Description of Cumulative Effects Study Area Boundaries

The extent of the cumulative effects study area (CESA) varies with each resource, based on the geographic area of each resource expected to contribute an additive effect when combined with the potential effects of the Proposed Action. As a result, the list of projects or actions considered under the cumulative analysis may vary according to the resource being considered. In addition, the length of time for cumulative effects analysis would vary according to the duration of potential impacts associated with the Proposed Action on each resource or resources used. The two main CESAs are shown on **Figure 4-1.**

- The Hydrology CESA (762 square (sq.) miles) is identified as the Imlay hydrographic sub-basin (072) which is bounded by the Eugene Mountains to the north, the East Range to the northeast, the Humboldt Range to the east-southeast, Rye Patch dam to the south, the Trinity Range to the southwest, and the Majuba Mountains to the west-northwest. The sub-basin includes a portion of Buena Vista Valley which encompasses areas potentially affected by dewatering activities and surface disturbance associated with mine operations. The Hydrology CESA was developed to address potential cumulative impacts to soil, vegetation, water quality, air quality, and noxious weeds. **Table 4-6** outlines the CESA area by each resource.
- The Biology CESA (317.5 sq. miles) was developed to assess potential cumulative effects to special status species, migratory birds, and wildlife. The Biology CESA was chosen to be consistent with the selected 10-mile buffer surrounding the Project Area used for raptor baseline studies (AMEC 2014).

TABLE 4-6 Cumulative Effects Study Areas

Resource	CESA Name	CESA Size
Soils, Vegetation, Water Quality, Invasive, Non-native Species	Hydrology CESA	762 sq. miles / 487,680 acres
Migratory Birds, Special Species, Wildlife	Biology CESA	317.5 sq. miles / 203,200 acres

In addition, a generalized discussion of cumulative effects is presented for air quality and social and economic values based on the following geographic areas:

- Consistent with the analysis of direct and indirect effects, the Air Quality CESA for analyzing potential cumulative effects of emissions on air quality encompasses an area comprised of a 50 kilometer radius of the Florida Canyon Mine area. This general area is bisected by Interstate 80 and includes the Imlay hydrographic sub-basin as well as areas to the north (beyond Winnemucca) and northwest (Hycroft Mine) as well to the south

(just beyond Lovelock) (See **Figure 4-1**). The 50 kilometer distance is consistent with the USEPA's Guideline on Air Quality Models (Appendix W to 40 CFR Part 51) (EPA 2008b).

- Consistent with the analysis of direct and indirect effects, the CESA for economics and social values includes Humboldt and Pershing Counties as well as the communities of Winnemucca in southern Humboldt County, and Lovelock in Pershing County. Rationale for this CESA is primarily based on employees generally commuting to the Florida Canyon Mine from the Winnemucca and Lovelock areas and; therefore, employment, income, and taxes paid to local governments would be most affected in these respective communities and counties.

4.19.3 Past and Present Actions

General past and present actions and natural phenomena in the Biology and Hydrology CESAs, include exploration and mining, energy production and distribution, wildfire, fuels treatment, livestock grazing and rangeland improvements, ROWs, land exchanges, and recreation.

Mining and Mineral Development

A range of locatable minerals have been developed and mined in BLM's Winnemucca District dating back to the 1860s. Gold and silver are the most important metallic minerals mined in the Winnemucca District planning area. Other identified locatable minerals include mercury, tungsten, manganese, molybdenum, copper, barite, sulfur, gypsum, limestone, iron, diatomite, and clay, as well as precious and semiprecious gemstones (BLM 2013a).

A range of past and present surface management plans associated with past and present mineral development are located within the Hydrology and Biology CESAs. **Table 4-7** provides general statistics as accessed from BLM's LR 2000 (BLM 2014a) regarding the acreage of potential disturbance associated with past (expired) and current (authorized) surface management plans in the Hydrology CESA. A review of sand and gravel cases revealed no records.

For purposes of cumulative effects analysis, the total number of acres for each case recordation file is assumed to represent the total number of disturbed acres. While some of these acres may have been totally or partially reclaimed, these estimates provide a conservative assessment of total past or present disturbance related to mineral development within the CESA. In total, these mineral actions represent approximately 1.3 percent of the total land area within the Hydrology CESA.

TABLE 4-7 Summary of Past and Present Mineral Actions in Hydrology CESA

Case Type	Disposition	Number of Cases (By Individual Serial Numbers)	Range of Size	Total Potential Disturbed Acreage Based on Case Acres
Surface Management Plan (Plan/Notice)	Authorized	11	0.006 to 5,521 acres	6,127 acres
Surface Management Plan (Plan/Notice)	Expired	40	0.1 to 4.99 acres	94 acres
Totals	**--**	**51**	**--**	**6,221 acres**
Percentage of Hydrology CESA (487,680 acres)				**~ 1.3 percent**

Source: BLM LR 2000, (BLM 2014a)

All of the expired cases in the Hydrology CESA are less than 5 acres each. A vast majority of the authorized cases are small; with only 3 cases exceeding 50 acres. These 3 cases are all associated with Florida Canyon Mine and Standard Mine.

- Florida Canyon Mine - The main mineral development in both the Hydrology and Biology CESA is associated with Florida Canyon Mine. At the present time, the Plan of Operations Permit Boundary encompasses 5,521 acres. Existing permitted mining operations include an open pit gold mine and heap leach operation which initiated activity in 1986. Various expansions to the original mine site have occurred over the years through the permit amendment process. To date, several planned modifications have been approved for the mine, including mine pit expansions and additional disturbance areas to accommodate waste rock storage facility expansion, cooling ponds,

topsoil/growth media stockpiles, relocation of transmission lines, water production wells, road realignment, construction of a heap leach pad, and various minor adjustments in overall acreage permitted for disturbance.

- Standard Mine - The Standard Mine is a smaller operation located approximately 5 miles south of Florida Canyon Mine. Standard Mine is an open pit mine with reportedly 290,000 ounces of gold reserve (Jipangu 2014). Total BLM case acres associated with Standard Mine, via two individual serial numbers, totals 566.1 acres (55 acres and 511.1 acres respectively) (BLM 2014a).

Similarly, **Table 4-8** provides general statistics regarding the acreage of potential disturbance associated with past (expired) and current (authorized) surface management plans in the Biology CESA. A review of sand and gravel cases revealed no records. As with the Hydrology CESA, Florida Canyon Mine and Standard Mine make up the bulk of the total expired and authorized surface management case acres within the entire CESA and in total, these mineral actions represent less than 3 percent of the total Biology CESA.

TABLE 4-8 Summary of Past and Present Mineral Actions in Biology CESA

Case Type	Disposition	Number of Cases (By Individual Serial Numbers)	Range of Size	Total Potential Disturbed Acreage Based on Case Acres
Surface Management Plan (Plan/Notice)	Authorized	7	0.25 to 5,521 acres	6,108
Surface Management Plan (Plan/Notice)	Expired	20	0.01 to 5 acres	54
Totals	**--**	**27**		**6,162**
Percentage of Biology CESA (203,200 acres)				**~ 3 percent**

Source: BLM LR 2000, (BLM 2014a)

Energy Production and Distribution

The Nevada BLM GIS data (BLM 2014a) lists nine (9) individual authorized geothermal leases within the Hydrology CESA. As shown in **Table 4-9**, eight (8) of these leases are also within the Biology CESA. These eight (8) leases are all generally located (grouped) in T31N, R33E just west of the existing Florida Canyon Mine. One lease (NVN-088485) is located several miles to the north in T34N, R34E.

TABLE 4-9 Geothermal Lease Summary

Lease Number	Township	Range	Section	Lease Holder
NVN-091822	31 North	33 East	4,8,10,38	Presco Energy LLC
NVN-088485	34 North	34 East	12,14,24	Earth Power Resources Inc.
NVN-05832301	31 North	33 East	15,16,21,22,27,28	Rye Patch Ltd. Partners
NVN-047353	31 North	33 East	16,22,34,39	Presco Energy Booth G Martin III
NVN-086876	31 North	33 East	16	Presco Energy LLC
NVN-048027	31 North	33 East	20,28,32	Presco Energy LLC Booth G Martin III
NVN-086877	31 North	33 East	20,32	Presco Energy LLC
NVN-055347	31 North	33 East	22,34	Presco Energy Booth G Martin III
NVN-086878	31 North	33 East	28	Presco Energy LLC

TABLE 4-9 Geothermal Lease Summary				
Lease Number	**Township**	**Range**	**Section**	**Lease Holder**
NVN-086879	31 North	33 East	34	Presco Energy LLC

Source: BLM Nevada GIS Spatial Data Website, (BLM 2014b)

No producing oil or gas wells have been located within the Winnemucca District. Nine oil and gas exploration wells have been drilled between 1992 and 2004 within the Winnemucca District with three new wells permitted for drilling in 2005 on existing leases. None of these wells occur in the Florida Canyon Hydrology or Biology CESAs. Potential for oil and gas development in the Florida Mine CESA is considered low (BLM 2013a).

Wildfire

The BLM reports that throughout the Winnemucca District, a total of 1,127 fires have burned a total of 1.8 million acres between 1990 and 2011. Habitat and surface use loss is due to the invasion of cheatgrass in burned areas. An accelerated fire return interval and frequency is observed in cheatgrass-infested areas below 6,500 ft. BLM estimates that 2 percent of desert sink scrub, 12 percent of the salt desert scrub, 23 percent of sagebrush scrub, 2 percent of the riparian habitat, 4 percent of meadows, and 6 percent of the woodland has been impacted by fire over this timeframe (BLM 2013a).

Table 4-10 presents a summary of fires, recent fire years, and associated acreages impacted within both the Hydrology and Biology CESAs. Based on available GIS data, approximately 250,245 acres within the Hydrology CESA burned between 1985 and 2008 (approximately 51 percent) including areas that have burned more than once for a total of 287,383 acres. Approximately 75,794 acres within the Biology CESA have burned over that same timeframe (approximately 37 percent); with several acres burning more than once for a total of 75,807 acres.

TABLE 4-10 Wildland Fire Summary			
Fire Name	**Fire Year**	**Acreage within Hydrology CESA**	**Acreage within Biology CESA**
Unnamed	1985	2,421	980
Unnamed	1985	8,261	
Unnamed	1986	1,884	
Unnamed	1986	9,80	
Unnamed	1987	7,137	
Unnamed	1995	5,240	
Unnamed	1995	66	
Unnamed	1996	4,098	
Unnamed	1998	10,934	
Unnamed	1998	32	32
Unnamed	1999	7,135	
Unnamed	1999	30,430	
Unnamed	1999	1,788	
Unnamed	1999	52	
Unnamed	1999	10,188	
Unnamed	1999	97,275	32,410
Unnamed	1999	1,862	22,161
Unnamed	1999	523	315
Unnamed	1999	6	170
Unnamed	2000	111	
Unnamed	2000	257	
Unnamed	2000	13	
Unnamed	2000	14	14
Unnamed	2000	14,273	13,432
Unnamed	2000	1	
Unnamed	2000	36	36
Unnamed	2000		54
Golden Eagle	2001	895	
MM161	2001	18	
MM 162	2001	6	
Callahan	2001	51	51
Willow Tree	2001	5,602	
Spaulding	2001	3,859	
Humboldt	2001	8	8
Standard	2001	1,280	1,280
Victory	2001		0.7
Tungsten	2006	2	
Sage	2006	6,632	
Tungsten	2007	61,685	4,863
Dun Glen	2007	430	
Barrel Springs	2007	2,584	
Barrel Springs2	2007	294	

Source: BLM Nevada GIS Spatial Data Website, (BLM 2014b)

Effects on vegetation can include loss or partial removal of upland species, potential removal of below ground biomass, soil hydrophobicity, and potential for increasing spread of noxious weeds and invasive grasses. Following each wildfire event, BLM evaluates and develops appropriate Burned Area Rehabilitation plans to address specific resource concerns. The extent to which a burned area is reseeded is governed by variables which are evaluated on site specific

basis such as burn intensity, soil stability, and pre-burn conditions. Site evaluations following wildfire events have determined that unseeded areas could rehabilitate naturally due to pre-fire vegetative conditions, elevation, precipitation zone, and site potentials.

Current burn rehabilitation projects within the Winnemucca District (listed as currently or recently under NEPA review), and located in and around the CESAs including:

- The Cosgrave Fire Emergency Stabilization/Burned Area Rehabilitation Project (T34N, R36E, Sections 20, 30) which authorizes broadcast seeding of 90 acres of BLM managed public lands, noxious weed inventory across the entirely of the fire area, and noxious weed treatments on up to 20 acres each year through 2016 (DOI-BLM-NV-W010-2013-0074-DNA).
- The Raspberry Fire Emergency Stabilization/Burned Area Rehabilitation Project (T33N, R36E, S6 and T34N, R36E, S32) which authorizes broadcast seeding of 334 acres of BLM managed public lands, noxious weed inventory across the entirely of the fire area, and noxious weed treatments on up to 25 acres each year through 2016 (DOI-BLM-NV-W010-2013-0075-DNA).
- The Dun Glen Fire Emergency Stabilization/Burned Area Rehabilitation Project (T33N, R35E, S12) which authorizes the drill or other ground seeding of 161 acres, the construction of approximately one mile of temporary fence, and conducting noxious weed inventories and treatments on up to 25 acres each year until the winter of 2015. (DOI-BLM-NV-W010-2013-0073-DNA).

In addition, the Winnemucca District Drought Response Plan EA was prepared in May 2013 to analyze a range of Drought Response Actions (DRAs) that would be used to mitigate effects of drought and to avoid emergency situations. These include a variety of temporary management actions including water hauls; above ground pipelines; changes in livestock season of use; reductions in livestock grazing duration; adjustments in livestock management practices; fencing; targeted grazing of invasive annual dominated plant communities; changes in kind or class of livestock; and wild horse and burro relocations or removals (BLM 2013b).

Fuel Treatments

BLM Fire Management Plans are implemented to reduce adverse impacts through reduction of hazardous fuel loads and provide resource-focused response strategies and new procedural guidelines. The Winnemucca District also annually updates its Fire Management Plan (FMP) to ensure the plan is in accordance with changing conditions due to large fires, drought, changes in fire risks or hazards, vegetation changes, or other updated information that would modify fire suppression targets or priorities within the district. Changing conditions noted include recent large fires occurring in the district, and an increased focus on preserving intact habitat for sage grouse, the plan must be updated to encompass these conditions and policy (BLM 2013c)

Plans identify fire prevention actions such as vegetation manipulation, fuel reduction, green strips, fuel breaks, and thinning that can be maximized through use of prescribed burning, mechanical, chemical, and biological (including grazing) treatments to reduce wildfire fuel hazards. Treatments are strategically situated to protect human communities and resource values (BLM 2013a). Of the entire acreage within the Winnemucca District, the BLM treated 11,087 acres between 2003 and 2010 via 52 individual projects (BLM 2013a). Main projects including chemical treatments, mowing, seeding, disking, thinning, and prescribed fire.

Livestock Grazing

Grazing allotments administered by the BLM located within the Hydrology and Biology CESAs are summarized in **Table 4-11** including the number of active AUMs within each allotment (as a whole). Grazing is seasonal and permits cattle and sheep. Available GIS data identified ten (10) allotments encompassing 721 sq. miles (461,440 acres) within the Hydrology CESA and six (6) allotments encompassing approximately 311 sq. miles (199,040 acres) within the Biology CESA. The Humboldt House allotment is the only one to intersect with the Project Area. Livestock grazing, depending on the intensity and duration, can affect the diversity and productivity of plant communities and wildlife habitats.

TABLE 4-11 Grazing Allotments within the Hydrology and Biology CESAs

Allotment Name	Active AUMs within Entire Allotment[1]	Acreage within Biology CESA[2]	Acreage within Hydrology CESA[2]
Prince Royal	153	20,701	20,687
Klondike	4,610	--	315
Humboldt Valley	1,582	143,901	105,479
White Horse	1,970	--	36,161
Majuba	3,325	45,397	144,652
Coal Canyon-Poke	3,144	--	6,699
Rye Patch	1,981	24,940	29,728
Humboldt House	728	60,659	60,570
Star Peak	3,075	33,214	56,382
Dolly Hayden	1,067	--	813

Sources: BLM Winnemucca District Proposed RMP/Final EIS (BLM 2013a)[1] and BLM Nevada GIS Spatial Data Website,
(BLM 2014b[2])

Rights of Way

Rights of way within the Hydrology and Biology CESAs include irrigation, oil and gas pipelines, telephone lines, power transmission lines, communication sites (cell towers), highways (i.e., Interstate 80), and railroads. Most of these ROWs are linear features crossing portions of the landscape. Permanent disturbances associated with ROWS are typically limited. Approximately 93 individual authorized ROWs are located within the Hydrology CESA with a case acre total of approximately 12,450 acres. Approximately 72 individual authorized ROWs are located within the Biology CESA with a case acre total of 11,300 acres (BLM 2014a).

The largest single ROW located within both the Hydrology and Biology CESAs is the Pitt-Taylor Reservoir (4,931 acres). Two of the other large linear features that intersect both CESAs include the Southern Pacific Railroad (2,013 acres total) and the Paiute Pipeline (570 acres total).

Land Exchanges

The BLM (2013) reports that in general, land tenure adjustments may be used to resolve split mineral estate situations, to consolidate public land (through sale, exchange, or acquisition), to acquire access, and to resolve unauthorized use cases. Land tenure adjustments are also important to the local and state governments to consolidate ownership and to make land available for public use purposes.

Public lands that may be suitable for disposal through transfer to another agency, exchange, or public sale are identified as Zone 3 land. Zone 2 land is evaluated on a case-by-case basis to determine if the tracts are suitable for disposal, while land in Zone 1 would be retained in federal ownership. Zone 3 land is located throughout the Winnemucca District; however, no criteria were identified in BLM's 1999 Lands Amendment defining the exact locations of boundaries separating Zone 3 land from Zone 1 and 2 land. As such, the BLM reports difficulty in identifying the boundaries of Zone 3 land; especially around Interstate 80 (BLM 2013a). No specific information is available regarding the status or size of any specific past or present land exchanges in the Hydrology or Biology CESAs.

Recreation

Dispersed recreation occurs throughout the Hydrology and Biology CESAs; however, no specific data is available on the level of uses in the CESAs. The five most popular dispersed recreational activities within the Winnemucca District include OHV use, hunting, pleasure driving, fishing, and camping (BLM 2013a). The nearest recreational facilities to the Project Area include the state-managed Rye Patch Reservoir and the lower and upper Pitt Taylor reservoirs. These facilities are located in western portion of the CESAs and offer water based recreation such as canoeing, boating, water skiing, swimming, and fishing.

4.19.4 Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions are those actions that are known or could reasonably be anticipated to occur within the CESA and within a time frame appropriate to the expected impacts from the Proposed Action. For this Project, the time frame for potential future actions is assumed to be the life-of-mine duration (including reclamation), or approximately 10-13 years.

Based upon a review of LR2000 data (BLM 2014a) 4 pending mineral surface management cases are presently on file in the Hydrology CESA, with a total case acreage less than 14 acres (**Table 4-12**). A total of 10 pending ROW cases are recorded in the system, with a total case acreage of approximately 378 acres. The largest pending ROW consists of a 120-kV Transmission line proposed to serve the Hycroft Mine (284.8 case acres).

TABLE 4-12 RFFAs in the Hydrology CESA				
Case Type	**Serial Number**	**Applicant**	**Action Details**	**Total Potential Disturbed Acreage Based on Case Acres**
Mineral Surface Management Plan (Plan/Notice)				
380910	NVN 081997	FCMI - Standard Gold Mining	Slope failure – encroachment outside of exploration plan onto public land.	0.4
380913	NVN 090411	Phillip Geertson	Trenching (authorized 3/13/2014).	4.99
			Subtotal	5.4 acres
ROWS (road, transmission, material, pipelines, water etc.) listed as Pending				
281001	NVN 077697	Nevada Cement Co.	Limestone conveyor and road from mine to mill site.	53.7
288100	NVN 084527	Southwest Gas Corp.	Buried 4 inch natural gas pipeline at Tungsten to serve Golden Predator Mine.	1.2
287001	NVN 084659	Springer Mining Co.	2 buried pipelines water/tailings, access road, and power line.	10.8
287001	NVN 084660	Springer Mining Co.	2 fresh water storage tanks, water pipelines, storage yard, road.	2.7
281001	NVN 089325	Pershing County Road Department	Road rights of way.	10.9
285003	NVN 091828	Sierra Pacific Power	Power transmission cases combined.	3.4
285003	NVN 091830	Sierra Pacific Power	Reissue case under FLPMA.	3.6
289001	NVN 092181	Nevada Bureau of Mines & Geology	Geodetic benchmarks.	0.1
285003	NVN 092182	Nevada Energy	120-kV transmission line to Hycroft Mine and Winnemucca Area.	284.8
285002	NVN 092892	Sierra Pacific Power	Power line to western union radio relay northwest of Imlay.	7.2
			Subtotal	378.4 acres
			TOTAL	**383.8 acres**
Percentage of Hydrology CESA (487,792 acres)				**<1 percent**

Source: BLM LR 2000, (BLM 2014a)

The pending surface management and ROW cases (9 in all) within the Biology CESA (**Table 4-13**) total less than 100 acres. The largest pending ROW case (53.7 case acres) involves Nevada Cement Company's proposal for a limestone conveyor and road from the mine to the mill site in T30N, R33E, S4 and 10.

TABLE 4-13 RFFAs in the Biology CESA				
Case Type	**Serial Number**	**Applicant**	**Action Details**	**Total Potential Disturbed Acreage Based on Case Acres**
Mineral Surface Management Plan (Plan/Notice)				
380910	NVN 081997	FCMI - Standard Gold Mining	Slope failure – encroachment outside of exploration plan onto public land.	0.4
380913	NVN 090411	Phillip Geertson	Trenching (authorized 3/13/2014).	4.99
			Subtotal	5.4 acres
ROWS (road, transmission, material, pipelines, water etc.) listed as Pending				
281001	NVN 077697	Nevada Cement Co.	Limestone conveyor and road from mine to mill site.	53.7
287001	NVN 084659	Springer Mining Co.	2 buried pipelines water/tailings, access road, and power line.	10.8
281001	NVN 089325	Pershing County Road Department	Road rights of way.	10.9
289001	NVN 092181	Nevada Bureau of Mines & Geology	Geodetic benchmarks.	0.1
285002	NVN 092892	Sierra Pacific Power	Power line to western union radio relay northwest of Imlay.	7.2
			Subtotal	82.7 acres
			TOTAL	**88 acres**
Percentage of Biology CESA (203,200 acres)				**<1 percent**

Source: BLM LR 2000, (BLM 2014a)

Continuation of Past and Present Actions

Activities/events expected to continue throughout the CESAs include livestock grazing, grazing permit renewals and road maintenance. Dispersed recreation would likely increase over time consistent with recent visit and visitor use trends reported by the BLM (BLM 2013a). Wildlife events are anticipated to continue at levels equivalent to recent history.

Other specific BLM-related projects in and around the CESAs include:

- Restoration Research Regarding Cheatgrass Stand Failure (T33N R36E S32) which involves research to determine whether cheatgrass stand replacement failure represents an opportunity for native restoration of severely invaded areas in the Great Basin (DOI-BLM-NV-W010-2012-0052-CX).
- Rye Patch Fire Station project to construct fire-fighting facilities in the Rye Patch area adjacent to the intersection of Stampede Road and Pyramid Lake Road to support fire suppression preparedness. Areas of disturbance would be approximately 2.5 acres with 2.5 acres reserved for future expansion; phased over 3 years.

4.20 CUMULATIVE IMPACTS TO AFFECTED RESOURCES

4.20.1 Air Quality

Relevant CESA

The CESA for Air and Atmospheric Resources is the Air Quality CESA, which includes a 50-kilometer radius around the Project Area and consists of approximately 2,167,175 acres (**Figure 4-1**).

Impacts from Past and Present Actions

Prior to the implementation of the FCAA, few if any measures to control or minimize impacts to air quality were required. Most mining operations were of smaller scale and consisted of underground operations with small disturbance footprints. Most air quality impacts from these operations consisted of the generation of fugitive dust during exploration road building, trenching, and mining operations, as well as agricultural operations and travel on dirt roads. Present actions within the Air Quality CESA likely to be contributing to air quality impacts include wildland fire, dispersed recreation, ROW construction and maintenance, mineral exploration and mining, industrial operations (i.e., construction facilities, power generation facilities, generators), and transportation networks. These activities are principally contributing point source particulate matter emissions and fugitive dust to the air quality impacts; however, products of combustion are also emitted. **Table 4-14** provides a summary of the emissions from major sources within a 50-kilometer radius around the Project Area. These emissions include those sources that have air quality operating permits from the BAPC, vehicle travel on Interstate 80 and other roads, railroads, and the Winnemucca Municipal Airport.

TABLE 4-14 Air Quality Emissions within a 50 Kilometer Radius of the Proposed South Expansion Project Area

Emission Sources	Cumulative Emissions (tons per year)						
	PM	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC
Facilities	1,233.41	383.57	382.84	828.75	160.48	373.13	193.40
Roads/Vehicles	98.22	98.22	95.07	2,490.46	420.51	189,521.16	488.10
Proposed Project Total	1,258.57	305.74	35.70	189.32	4.49	308.10	16.67
Total	2,590.19	787.53	513.60	3,508.53	585.49	190,202.39	698.17
Project Cumulative Contribution	48.59%	38.82%	6.95%	5.40%	0.77%	0.16%	2.39%

Source: Enviroscientists 2013

Historic wildland fires (2001-2011) have burned approximately 223,187 acres within the Air Quality CESA, which is approximately ten percent of the Air Quality CESA. Approved mineral exploration and mining notices and plans of operations, as well as mineral material disposal sites, total approximately 31,103 acres of surface disturbance, which is approximately 1.4 percent of the Air Quality CESA. ROWs, covering approximately 55,610 acres (approximately 2.6 percent of the CESA), issued within the Air Quality CESA were issued for facilities that have the potential to create surface disturbance or impact air quality. Impacts to air quality from dispersed recreation are not able to be quantified.

Impacts from RFFAs

RFFAs within the Air Quality CESA that may contribute to impacts to air quality include wildland fire, dispersed recreation, ROW construction and maintenance (approximately 889

acres or approximately 0.04 percent of the CESA), mineral exploration and mining including mineral material disposal sites (approximately 109 acres or approximately 0.005 percent), industrial operations (i.e., construction facilities, power generation facilities, generators), and transportation networks. Air quality impacts from RFFAs could include generation of fugitive dust during hard rock mining and exploration. Emissions may also be generated from processing facilities, burning of fossil fuels by heavy equipment and other vehicles, vehicle travel on paved and unpaved roads, fugitive dust from travel on unpaved roads, and wildland fires. Some of these emissions would be localized and subject to BAPC air quality permits and compliance, development of mitigation measures, and implementation of operational performance standards. Others would be more long term and basin wide.

Cumulative Impacts

Proposed Action

Each of the identified individual projects within the CESA, including existing and proposed mining operations, emit air pollutants. With the possible exception of motor vehicle emissions, the existing and proposed mining operations are the major sources of criteria pollutants within the CESA. The modeling for the Proposed Action shows that the levels of these pollutants are below the applicable NAAQS and Nevada AAQS. The Proposed Action's contribution to the cumulative air quality environment would not result in cumulative impacts that would exceed the NAAQS and Nevada AAQS. The RFFAs would result in additional emissions similar to those currently emitted by existing operations within the CESA. In addition, the major sources of pollutants (except for motor vehicle emissions) within the CESA would operate under permit conditions established by the BAPC.

No Action Alternative

No additional cumulative impacts would result from the No Action Alternative.

4.20.2 Cultural Resources

Relevant CESA

The CESA for Cultural Resources is the Cultural Study Area which encompasses 1,425 acres.

Impacts from Past and Present Actions

Past and present actions that could have impacted Cultural Resources might have included livestock grazing, rangeland improvements (e.g., fencing and irrigation), infrastructure development, land exchanges, fuels treatments, wildland fires, transportation networks, natural resource exploration and extraction, and recreational activity. Prior to the implementation of the NHPA, disturbances to Cultural Resources were not subjected to regulatory compliance. As such, past impacts to cultural resources may not have been documented.

The development of access corridors (e.g., roads and trails) and other ROWs (e.g., utility corridors) surrounding the Project Area have increased access to previously inaccessible areas leading to other potential impacts, specifically at Cultural Resource sites, including unauthorized artifact collection and vandalism. Along with the possible removal of artifacts from a site, and the possible destruction of site elements, prehistoric and historic-era sites may have been subjected to natural weathering and erosional processes that potentially displace surface and subsurface artifact assemblages. Any development or action that increased exposure to

weathering or intensified erosion could have impacted the primary depositional setting of Cultural Resource sites in the Project Area.

Impacts from RFFAs

Potential impacts from natural resource exploration and extraction, including the Proposed Action, continued livestock grazing, rangeland improvements, fires and fuels treatments, recreational activity, unauthorized artifact collecting, vandalism, and natural erosional processes, could occur within the Cultural Resources CESA.

Cumulative Impacts

Proposed Action

The proposed SWRSF expansion area (316 acres) overlaps approximately 255 acres (approximately 18%) of the Cultural Resources CESA. As such, the proposed action would destroy cultural resources identified in the Cultural Resource CESA though grading, excavation, and waste-rock storage. NRHP-eligible site CrNV-22-3345 occupies approximately 3.05 acres within the Cultural Resources CESA and the proposed SWRSF expansion area. This prehistoric site would be directly impacted by the proposed SWRSF expansion operations.

NRHP-eligible site CrNV-02-11711, another prehistoric artifact assemblage, is located immediately adjacent to the southern portion of the proposed SWRSF diversion channel. As currently depicted on Project Area maps, CrNV-02-11711 would not be directly impacted by the proposed action. However, due to the close proximity of the site to the SWRSF diversion channel construction area, avoidance measures are necessary. A buffer zone would include the construction of a fence, and monitoring would be done by a qualified archaeologist during SWRSF diversion channel construction in the vicinity of CrNV-02-11711.

No Action Alternative

No additional cumulative impacts would result from the No Action Alternative.

4.20.3 Invasive, Non-Native Species

Relevant CESA

The CESA for invasive and non-native species is the Hydrology CESA, which encompasses approximately 487,680 acres.

Impacts from Past and Present Actions

Past and present actions in the Hydrology CESA have resulted in increased density and distribution of cheatgrass and medusahead, annual grasses that proliferate after fire and intense grazing and trampling by livestock, and other disturbances that reduce the cover of native vegetation. Large areas of rangeland in this CESA have high densities of these species.

Impacts from RFFAs

RFFAs would have the same potential as past and present activities to increase areas infested with noxious weeds and other invasive species; however, the relatively small incremental disturbance that would result would affect less than 1 percent of the Hydrology CESA.

Cumulative Impacts

Proposed Action

The Proposed Action would disturb soil and existing plant communities, which would create favorable conditions for noxious weeds to invade and become established; however, impacts from noxious weeds would be avoided or reduced by implementation of measures presented in Chapter 1.2.6. and implementing environmental protection measures which would include: concurrent reclamation and removal of invasive, non-native species on reclaimed areas and other disturbed sites in the Project Area. With environmental protection measures, minimal incremental impacts of invasive, non-native species are expected. Controlling weed infestations on land disturbed by mining would eliminate any additive contribution the Proposed Action would have to existing weed conditions within the Hydrology CESA.

No Action Alternative

No additional cumulative impacts would result from the No Action Alternative.

4.20.4 Migratory Birds, Special-Status Species, and Wildlife

Relevant CESA

The CESA for migratory birds, special-status species, and wildlife is the Biology CESA, which encompasses 203,200 acres.

Impacts from Past and Present Actions

Past and present actions have removed or degraded shrub habitats, especially sagebrush-dominated communities, which have reduced habitat quality and quantity for the greater sage-grouse and Brewer's sparrow, species obligately associated with sagebrush. Other migratory birds have also been affected by habitat removal and degradation.

The Preble's shrew and dark kangaroo mouse have been affected by past and present activities in the Biology CESA through habitat removal and degradation. Suitable habitat for these species appears to be widespread, but surveys for these species have not been conducted over most of this CESA; consequently, the impacts from past and present activities on these species cannot be accurately assessed.

Although comprehensive surveys for sensitive plant species have not been conducted within the Biology CESA, it is likely that past and present actions have removed or degraded habitat for the sand cholla and Lahontan beardtongue. The lack of information on population size and distribution of these species in this CESA precludes quantitative evaluation of effects of past and present actions.

Impacts from RFFAs

With the exception of wildfire, RFFAs would have the same potential as past and present activities to affect migratory birds, special-status species, and wildlife; however, the relatively small incremental disturbance that would result from future activities would affect less than 1 percent of the Biology CESA, which would not likely affect the viability of populations of migratory birds, special-status species, and wildlife in this CESA. The amount of land that could be subject to wildfire over the next 13 years within the CESA cannot be quantified.

Cumulative Impacts

Proposed Action

The Proposed Action would remove 70 acres of sagebrush habitat and 675 acres of salt-desert shrub habitat, which would be a small incremental loss within the Biology CESA.

Approximately 70 acres of sagebrush/Utah juniper habitat, classified generally by NDOW as Category 4 Habitat (Low Value Habitat and Transitional Range) would be removed); however, this is a negligible loss in a regional context. Population segments of Brewer's sparrow and other migratory birds within the Project Area would be displaced. Habitat for the Preble's shrew and dark kangaroo mouse would be removed and individuals of these species would be killed if they were present. Based on calculations derived from Hafner and Upham 2011, the dark kangaroo mouse distribution within the Biology CESA is estimated to be 171,904 acres. The Proposed Action (1,288 acres) would constitute a minute fraction of this overall range (0.7 percent). Based on data derived from NatureServe (2014) the Preble's shrew Nevada range (13.6 million acres) does not extend south to the Biology CESA. However, Ports and George (1990) report that studies in Elko County, Nevada suggest that this shrew may be more common and widespread in the northern Great Basin than previously supposed. Comparing the Preble's shrew Nevada range (13.6 million acres) with the Biological Resources Assessment Area (1,879 acres) and the assumed presence of Preble's shrew within the assessment area, the Proposed Action would constitute a minute fraction of the overall Preble's shrew Nevada range. Habitat for all of these species would be fragmented, which could reduce it's the capacity to support associated wildlife species. Many species of migratory birds find optimum nesting and brood-rearing conditions in unfragmented patches of suitable habitat.

Populations of sand cholla and Lahontan beardtongue in the Project Area would be removed or greatly reduced with the Proposed Action. Because the population status of these species within the Biology CESA is not known, it is not possible to assess how the Proposed Action would affect the viability of these species in this CESA. The sand cholla is known from 13 counties in Nevada and is likely more widespread than present data indicates so it is unlikely that the Proposed Action and other cumulative impacts in the Biology CESA would adversely affect the species over its range of occurrence in Nevada. AMEC (2014) reported that three previous studies within the Biology CESA have found the sand cholla to be present within several miles of the Project Area but information is not included on population size or conservation status within the areas these surveys encompassed.

The Lahontan beardtongue is known from 18 locations in four counties in Nevada; however, because data is not available on the population status of this species in the Biology CESA, it is not possible to reasonably predict how the loss of the population segment in the Project Area would affect the population viability in this CESA. AMEC (2014) reported that three previous studies within the Biology CESA have found the Lahontan beardtongue to be present within several miles of the Project Area but no information on population size or conservation status within the Assessment Area has been reported.

Potential impacts to the viability of the sand cholla and Lahontan beardtongue would be reduced or avoided by transplanting individuals that would be impacted to undisturbed suitable habitat adjacent to the Project Area. Also, collecting seed for propagation in a nursery and out planting to suitable habitats would reduce the risk to population viability for these species in the CESA.

No Action Alternative

No additional cumulative impacts would result from the No Action Alternative.

4.20.5 Water Quality (Surface/Ground)

Relevant CESA

The CESA for water is the Hydrology CESA (487,680 acres; **Figure 4-1**).

Impacts from Past and Present Actions

Past actions likely to have collectively impacted surface water include agriculture, municipal and rural development, livestock grazing, rangeland improvements, ROWs, land exchange, fuels treatments, wildland fire, transportation networks, exploration, mining, and recreation. These activities and land uses can degrade water quality and quantity primarily through increased sedimentation. Degradation of water quality is regulated (permitted and monitored) by NDEP, and degradation of water quantity is regulated by NDWR. Relatively small areas within the CESA are developed for the actions described above. Disturbances are approved for mineral activities in the Hydrology CESA. Reclamation would be required when these disturbances are completed, thereby limiting the amount of sedimentation generated by these disturbances. No data regarding effects of these land uses and activities on water quality/quantity are available to quantify the impact on existing water resources.

Impacts from RFFAs

Potential impacts to surface water quality could result from ongoing and future land uses and practices including agriculture, municipal and rural development, livestock grazing, rangeland improvements, ROWs, land exchange, fuels treatments, wildland fire, transportation networks, exploration, mining, and recreation. No specific data is available on the amount of water quality and quantity degradation that could result from these activities; however, mining activities would be required to have spill prevention plans, manage hazardous substances in accordance with NDOT and MSHA, adhere to NAC 534.4369 and 534.4371, and utilize BMPs, thus minimizing impacts to water quality. Mining activities would also be required to measure and report water quantity usage and adhere to NAC 532, thus minimizing impacts to water quantity.

Cumulative Impacts

Proposed Action

The Proposed Action (1,288 acres) would impact less than one one-thousandth of the CESA (487,680 acres). Surface disturbance at the Project Area would increase potential for sedimentation in the ephemeral surface water system; however environmental protection measures outlined in Chapter 2.1.11 and concurrent reclamation would minimize this impact. As a result, the incremental impact to surface water quality and quantity in the Hydrology CESA is expected to be less than the limits of observation and measurement.

No Action Alternative

No additional cumulative impacts would result from the No Action Alternative action

4.20.6 Economics and Social Values

The CESA for economics and social values includes Humboldt and Pershing Counties as well as the communities of Winnemucca in southern Humboldt County, and Lovelock in Pershing

County. Rationale for this two-county CESA is primarily based on employees generally commuting to the Florida Canyon Mine from the Winnemucca and Lovelock areas and; therefore, employment, income, and taxes paid to local governments would be most affected in these respective communities and counties. See **Figure 3-3**.

Impacts from Past and Present Actions

Past and present actions within the two-county CESA include a similar range of general land uses as discussed for the biological and hydrology CESAs including activities associated with exploration and mining, energy production and distribution, wildfire suppression, fuels treatment, livestock grazing and rangeland improvements, ROWs, land exchanges, and recreation.

Specific to mining development in the two-county CESA, based on 2011 data (NBMG 2012) four major mines are located within Pershing County, including the Florida Canyon Mine, Coeur Rochester Mine, and Sunrise Gold Placer Mine producing gold and silver as well as the Colado Mine (diatomite). Nine major mines are located in Humboldt County including five gold/silver mines (Twin Creeks Mine, Turquoise Ridge Joint Venture, Marigold, Lone Tree, Hycroft), two opal mines (Rainbow Ridge and Royal Peacock) and two industrial mineral mines (MIN-AD and Ashdown).

Activities such as mining and energy production are part of the existing social and economic climate within the CESA and represent activities which support the existing population, continued employment opportunities and income generation, demand for public services, and maintain revenues and expenditures for communities/counties within the economics and social values CESA.

Impacts from RFFAs

Reasonably foreseeable future actions include those actions that are known or could reasonably be anticipated to occur within the two-county CESA over 10-13 years of life-of-mine associated with the Proposed Action. These RFFAs consist of the same range of activities discussed above, thus supporting continued long-term employment opportunities and economic development.

In addition to the Proposed Action, BLM is reviewing a proposed mine expansion at the Coeur Rochester Mine which would expand existing operations and extend life-of -mine at that facility. Anticipated construction associated with Coeur Rochester Mine expansion (installation of liners) is generally slated for summer/fall 2015 or spring 2016 based on the current schedule for BLM permitting. Similar anticipated construction activities associated with the Proposed Action would occur in fall of 2014 or spring 2015 based on the current scheduling (Holzel 2014).

Cumulative Impacts

Proposed Action

Past and present actions within the economics and social values CESA, as well as RFFAs including the Proposed Action and the Coeur Rochester Mine expansion would collectively extend and enhance existing employment opportunities and economic growth in the area by extending operations and offering continued and some small level of additional employment. Cumulative impacts, as a result of the Proposed Action when added to past and present actions and RFFAs, are expected to be generally positive with extended employment, income, and tax benefits over the 8-year life-of-mine.

On a temporary basis, both the Proposed Action and the Coeur Rochester Mine expansion would provide short-term employment to workers to support construction activities; however no overlap with regard to construction timing between the two projects is anticipated. Many construction workers would likely already reside in the two-county CESA. Some specialty out-of-state contractors may be required for both projects over a period of several months (e.g., to install leach pad liners), meaning there would be short-term cumulative effects on temporary housing (hotels), restaurants and other service sectors, as well as community services. Such impacts would be short term and existing facilities within the two-county CESA would likely be adequate to support any-short term influx of construction workers.

No Action Alternative

No additional cumulative impacts would result from the No Action Alternative.

4.20.7 Soils

Relevant CESA

The CESA for soils is the Hydrology CESA (487,680 acres; **Figure 4-1**)

Impacts from Past and Present Actions

Past actions likely to have collectively impacted soils include agriculture, municipal and rural development, livestock grazing, rangeland improvements, ROWs, land exchange, fuels treatments, wildland fire, transportation networks, exploration, mining, and recreation that disturbed or impacted soils, or that increased erosion or sedimentation. There are no specific data to quantify soil loss available.

Impacts from RFFAs

Future land uses and practices that could result in potential impacts to soil erosion include agriculture, municipal and rural development, livestock grazing, rangeland improvements, ROWs, land exchange, fuels treatments, wildland fire, transportation networks, exploration, mining, and recreation. No specific data regarding the amount of soil erosion that could result from these activities is available.

Cumulative Impacts

Proposed Action

The Proposed Action (1,288 acres) would impact less than one-thousandth of the CESA (487,680 acres). Surface disturbance at the Project area would increase episodic erosion; however concurrent reclamation and environmental protection measures outlined in Chapter 2.1.11 would minimize impacts from the Proposed Action. As a result, minimal incremental impact to soils in the Hydrology CESA is expected.

No Action Alternative

No additional cumulative impacts would result from the No Action Alternative.

4.20.8 Vegetation

Relevant CESA

The CESA for vegetation is the Hydrology CESA, which covers 487,680 acres.

Impacts from Past and Present Actions

Past and present actions that could impact vegetation include exploration and mining, energy production and distribution, ROWs, livestock grazing, dispersed recreation and natural phenomena such as wildfires. Past, present, and proposed actions associated with mineral development have or would affect 6,221 acres, approximately 1.3 percent of the Hydrology CESA. Geothermal leases have been issued for 13 sections just west of the existing Florida Canyon Mine; however, there has been little surface disturbance associated with these leases.

From 1985 through 2008, 250,245 acres (approximately 51 percent) have been burned in the Hydrology CESA by wildfire. Fires have increased the cover and density of cheatgrass, which has accelerated the fire return interval in cheatgrass-infested areas. Because many shrubs do not resprout after fire, shrub-dominated plant communities (e.g., salt-desert shrub and sagebrush) have been reduced by 12 to 23 percent in Nevada (BLM2013a).

Livestock grazing, depending on the intensity and duration, can affect the diversity and productivity of plant communities and wildlife habitats. There are approximately 253,756 acres of grazing leases on BLM-managed land, representing 52 percent of the CESA.

Rights-of-way (defined by BLM case acres) within the CESA occupy 12,450 acres (2.5 percent). Typically, placement of facilities in ROWs remove the vegetation permanently (e.g., highways and roads) or alter vegetation by soil disturbance (e.g., pipelines and power lines).

Dispersed recreational use in the CESA includes hunting, fishing, and camping. These activities can affect biological resources directly (e.g. game animal mortality) and through increased risk of fire, which can kill animals and degrade arid land habitats. Past and present actions in the CESA have resulted in the increased density and distribution of cheatgrass and medusahead, annual grasses that proliferate after fire and intense grazing and trampling by livestock, and other disturbances that reduce the cover of native vegetation. Large areas of rangeland in the CESA have high densities of these species.

Impacts from RFFAs

RFFAs would have the same potential as past and present activities, such as mining operations, dispersed recreation and natural phenomena to impact vegetation. These actions would likely contribute to habitat fragmentation, displacement of species, soil movement and loss or increase in the likelihood of invasive, non-native species. However, the relatively small incremental disturbance that would result would affect less than 1 percent of the CESA.

Cumulative Impacts

Proposed Action

The proposed Project would increase the area of disturbance from resource attraction activities by 1,392 acres. The Proposed Action would disturb soils and existing plant communities, which would increase the potential for soil erosion and create favorable conditions for noxious weeds to invade and become established. However, impacts would be avoided or reduced by implementation of environmental protection measures, which would include BMPs such as silt fences, water bars, ditches, and sediment ponds to control surface erosion and sediment from disturbed areas; concurrent reclamation; removal of invasive, non-native species on reclaimed areas and other disturbed sites in the Project Area. Slopes would be seeded using a BLM-approved seed mix to allow for re-establishment of a sustainable vegetation community. With

proposed environmental protection measures, minimal incremental impact to native vegetation is expected.

No Action Alternative

No additional cumulative impacts would result from the No Action Alternative.

5.0 RECOMMENDED MITIGATION

Mitigation measures for the supplemental authority elements and the additional resources considered for analysis that have been proposed for the Proposed Action are addressed below.

5.1 RECOMMENDED MITIGATION UNDER THE PROPOSED ACTION

5.1.1 Migratory Birds, Special-Status Species, and Wildlife

Potential impacts to the viability of the sand cholla and Lahontan beardtongue would be reduced or avoided by transplanting individuals that would be impacted to undisturbed suitable habitat adjacent to the Project Area. Also, collecting seed for propagation in a nursery and out planting to suitable habitats would reduce the risk to population viability for these species in the CESA.

FCMI would coordinate with BLM to develop seed mixes on reclaimed areas that would provide food and cover for wildlife species.

5.1.1.1 BLM Recommended Mitigation

Potential measures that could be taken to avoid extirpating the Lahontan beardtongue on the proposed expansion area would be to transplant individuals that would be destroyed by the Proposed Action to adjacent undisturbed habitats. Transplanting would need to done when the plants are dormant and would require excavation of entire root systems and associated soil for transplanting to have a reasonable likelihood of success. Collecting seed from local plants and propagating plants in the nursery for out-planting to suitable undisturbed adjacent sites would also reduce the risk of extirpating the local population. Similar measures could be taken to reduce the risk of extirpation for the population of sand cholla in the Project Area. Removing seeds of Palmer penstemon from the reclamation seed mix also would reduce the risk of Palmer penstemon hybridizing with Lahontan beardtongue.

5.1.2 Cultural Resources

As outlined in Chapter 4.2, unavoidable adverse effects to CrNV-22-3345 (buried by displaced earth) due to SWRSF expansion would be mitigated through the development of an appropriate Historic Properties Treatment Plan which would be implemented through a Memorandum of Agreement between the BLM and SHPO Similarly, if other NRHP-eligible sites or contributing elements are discovered within the Project Area during construction or other activities associated with the Proposed Action they would be mitigated through data recovery or avoidance measures approved by BLM in consultation with SHPO.

5.1.2.1 BLM Recommended Mitigation

Per USC 470h-2(b), the BLM is required to develop a data recovery plan for NRHP-eligible properties that are adversely impacted by the proposed action. The Historic Properties Treatment Plan for this proposed action is currently under review by the SHPO.

Adverse effects to CrNV-22-3345 would be mitigated by archaeological data recovery following a Historic Properties Treatment Plan developed by BLM. This plan also would address NRHP-eligible site CrNV-02-11711 immediately adjacent to the southern portion of the proposed SWRSF diversion channel. The plan calls for avoidance by utilizing a 50-meter (ca. 162-foot) buffer zone and an archaeological monitoring program.

The Plan would be implemented through a Memorandum of Agreement between the BLM and SHPO. Similarly, if other NRHP-eligible sites or contributing elements are discovered within the Project Area during construction or other activities associated with the Proposed Action they would be mitigated through data recovery or avoidance measures approved by BLM in consultation with SHPO. Additional NEPA analysis would be required if additional treatments are necessary.

Sites remaining unevaluated for listing on the NRHP—CrNV-02-3342, -22-6319 and -02-11945—are located south of the proposed SWRSF expansion area and SWRSF diversion channel and would be avoided by Project-related activities as currently proposed. If the SWRSF expansion area or diversion channel designs change, FCMI would avoid the three unevaluated sites noted above, or a revised treatment plan (and additional NEPA analysis) would be developed to mitigate potential impacts to those cultural resources. These collective mitigations included as part of a treatment plan, once approved by BLM in consultation with the Nevada State Historic Preservation Office (SHPO), would minimize adverse effects on historic properties in the Project Area.

5.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

No irreversible and irretrievable commitment of resources is expected as a result of the Proposed Action.

6.0 TRIBES, INDIVIDAULS, ORGANIZATIONS, OR AGENCIES CONSULTED

6.1 NATIVE AMERICAN CONSULTATION

The following Tribes were consulted as part of government-to-government consultation: Battle Mountain Band, Fallon Paiute and Shoshone Tribe, Lovelock Paiute Tribe, and Pyramid Lake Paiute Tribe.

6.2 AGENCY COORDINATION AND/OR CONSULTATION (AGENCIES)

No other agency consultation was used for base line reports and for the preparation of this EA.

6.3 INDIVIDUALS AND/OR ORGANIZATIONS CONSULTED

No additional individuals or organizations were consulted for the preparation of this EA.

6.4 PUBLIC OUTREACH/INVOLVEMENT

A letter and map were sent to a mailing list of potentially interested members of the public on July 23, 2013. Comments were received from five private individuals, state agencies, and interested parties. Concerns identified both internally from BLM and externally from the public centered on groundwater quality, air quality, wildlife, economic and social values, paleontological sites, recreation, dark skies initiative, rangeland improvements, and invasive/ nonnative plant species. This assisted the BLM in refining issues and in identifying new issues, coordination needs and possible alternatives.

7.0 LIST OF PREPARERS

7.1 BLM

Name	Area of Responsibility
Pat Haynal	Cultural Resources, Historic Trails, Paleontological Resources
Joey Carmosino	Historic Trials, Recreation, Visual Resource Management
Mark Hall	NEPA Compliance, Native American Religious Concerns
Debbie Dunham	Realty
Garret Noles/ Dana Truman	Rangeland Management
Fred Holzel	Minerals, Waste (hazardous or solid),
Eric Baxter	Invasive, Non-native species (plants and animals)
Rob Burton	Vegetation, Soil, Air Quality
Jeanette Black	Wetlands and Riparian Zones, Hydrology
Nancy Spencer-Morris and	T&E Species (plants and animals), Special Status
Amanda DeForest	Species (plants and animals), General Wildlife Habitat
Samantha Gooch	Wild Horse and Burro
Julie Suhr Pierce	Environmental Justice, Social Values, Economics

7.2 BLM CONTRACTORS

Jerry Moritz	Administrative Assistant

7.3 THIRD PARTY CONSULTANT

Name	Area of Responsibility
Steve Morrow	Project Manager, QA/QC
Terry Grotbo	Assistant Project Manager, Recreation, Transportation, Access and Public Safety, Social Values and Environmental Justice
Joe Elliot	Biology (Plants and Animals)
Keshab Simkhada	Air
Albert Gardner	Cultural Resources and Native American Values
Brian Giroux	Groundwater
Ben Peterson	GIS
Charlie Dettling	Surface Water
Rob Valceschini	Waste, Hazardous and Soil

7.3 THIRD PARTY CONSULTANT, continued

Name	Area of Responsibility
Marcie Wood	Geology/Paleontology
ASW/Newfields	Noise
Laura Pfister	Economics and Social Values, Environmental Justice, Realty, Recreation, Access
Barbara Hatch	Visual Resources

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