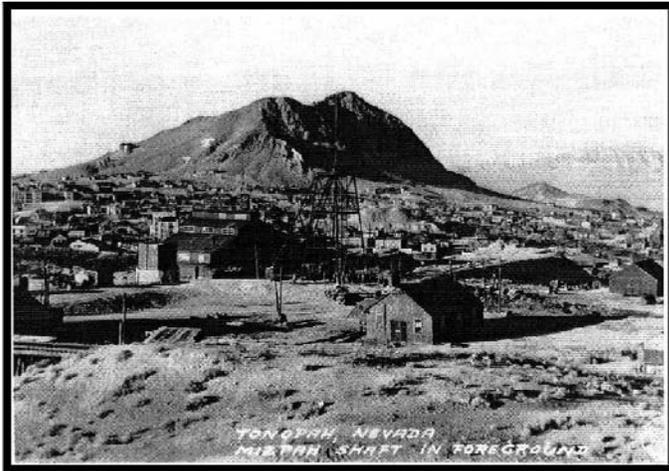


# ENVIRONMENTAL ASSESSMENT

DOI-BLM-NV-B020-2015-0054-EA

## Three Hills Mine Project



**October 2015**

**U.S. Bureau of Land Management  
Battle Mountain District  
Tonopah Field Office  
1553 South Main Street  
Tonopah, Nevada 89049**

**Cooperating Agencies: Esmeralda County  
Nevada Department of Wildlife  
Nye County**



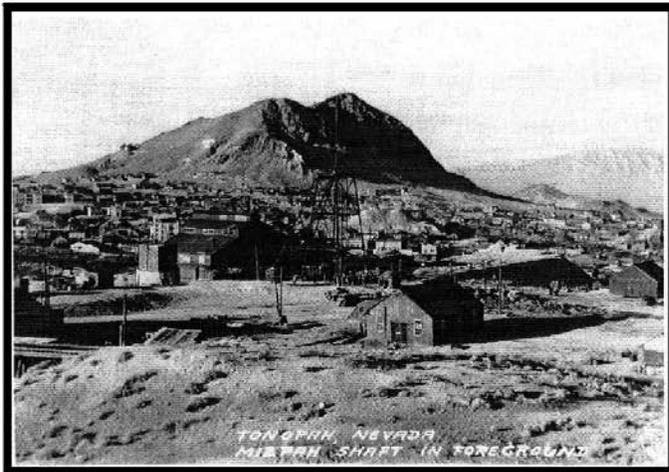
It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

DOI-BLM-NV-B020-2015-0054-EA

**WK MINING (USA) LTD.  
THREE HILLS MINE PROJECT  
ESMERALDA COUNTY, NEVADA**

Environmental Assessment  
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## LIST OF APPENDICES

### Appendix A: Bird and Bat Conservation Plan

## LIST OF ACRONYMS AND ABBREVIATIONS

°	degree
ADT	average daily traffic
AADT	annual average daily traffic
ABA	acid base accounting
ACEC	Area of Critical Environmental Concern
ADR	Absorption-Desorption-Recovery
Ag	silver
amsl	above mean sea level
ANFO	ammonium nitrate and fuel oil
ANGC	Allied Nevada Gold Corporation
AQIA	Air Quality Impact Analysis
ATF	Bureau of Alcohol, Tobacco, Firearms, and Explosives
As	arsenic
AUMs	animal month units
B&K	Bruel & Kjaer
BAPC	Bureau of Air Pollution Control
BBCS	Bird and Bat Conservation Strategy
bcy	bank cubic yards
BEA	Bureau of Economic Analysis
bgs	below ground surface
BLM	Bureau of Land Management
BMD	Battle Mountain District
BMP	best management practice
CAA	Clean Air Act
BMRR	Bureau of Mining Regulation and Reclamation
BSDW	Bureau of Safe Drinking Water
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	Cumulative Effects Study Area
CFR	Code of Federal Regulations
CIC	carbon-in-columns
CLAN	Cooperative Libraries Automated Network
cm/sec	centimeter per second
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CWA	Clean Water Act
dB	decibels
DETR	Department of Employment, Training, and Rehabilitation
DHS	Department of Homeland Security
DLGS	Division of Local Government Services
DNL	Day/Night Average Sound Level
DOAS	Division of Assessment Standards
EA	Environmental Assessment
ECPLPP	Esmeralda County Public Lands Policy Plan
ECSD	Esmeralda County School District
ECSO	Esmeralda County Sheriff's Office
ERU	equivalent residential unit
ET	evapotranspiration
EO	Executive Order
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act of 1973, as amended
F	Fahrenheit
FICON	Federal Interagency Committee on Noise

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FLPMA	Federal Land Policy and Management Act of 1976
FR	Federal Register
GHG	greenhouse gas
gpd	gallons per day
gpm	gallons per minute
GPS	global positioning system
GSN	Geological Society of Nevada
H	Horizontal
H <sub>2</sub> O	water
HCT	humidity cell test
HDPE	high density polyethylene
Hg	mercury
HLF	heap leach facility
HUD	Department of Housing and Urban Development
Hughes	Hughes Tool Company
Hz	Hertz
lb	pound
IBC	International Building Code
IM	Instruction Memorandum
K-Ar	potassium-argon
L <sub>eq</sub>	noise level average
L <sub>max</sub>	noise level maximum
LCRS	leachate collection and recovery system
LOM	life of mine
LTFM	Long-Term Funding Mechanism
Ma	million years
MBTA	Migratory Bird Treaty Act
MDB&M	Mount Diablo Base and Meridian
µg/m <sup>3</sup>	microgram per cubic meter
Mgal	million gallons
mg/l	milligrams per liter
µg/l	microgram per liter
Mine Plan	Three Hills Mine Plan of Operations #N-93515/Nevada Reclamation Permit Application
Mining Law	General Mining Law of 1872, as amended
MLFO	Mount Lewis Field Office
MMPA	Mining and Mineral Policy Act of 1970
MOPTC	Mercury Operating Permit to Construct
MOU	memorandum of understanding
MSHA	Mine Safety and Health Administration
Mt	million tons
MMT	million metric tones
MWMP	meteoric water mobility procedure
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NAG	net acid generation
NAGPRA	Native American Graves Protection and Repatriation Act
NCSO	Nye County Sheriff's Office
NDE	Nevada Department of Education
NDEP	Nevada Division of Environmental Protection
NDOA	Nevada Department of Agriculture
NDOW	Nevada Department of Wildlife
NDOT	Nevada Department of Transportation
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act of 1969
NESHAPs	National Emissions Standard for HAPs

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NHPA	National Historic Preservation Act of 1966
NMCP	Nevada Mercury Control Program
NNHP	Nevada Natural Heritage Program
N <sub>2</sub>	nitrogen
NO	nitrogen oxide
NO <sub>2</sub>	nitrogen dioxide
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NRP	Nevada Reclamation Permit
NRS	Nevada Revised Statute
NRV	Nevada Reference Value
NSDO	Nevada State Demographer's Office
NSPS	new source performance standards
O <sub>3</sub>	ozone
OPTC	Operating Permit to Construct
PAO	peak air overpressure
Pb	lead
PGA	peak ground acceleration
PM <sub>2.5</sub>	particulate matter with an aerodynamic diameter less than 2.5 microns
PM <sub>10</sub>	particulate matter with an aerodynamic diameter of ten microns or less
ppm	parts per million
Project	Three Hills Mine Project
PFYC	Potential Fossil Yield Classification
POD	Plan of Development
PPV	peak particle velocity
PSD	prevention of significant deterioration
psi	pounds per square inch
PWR	public water reserve
RC	reverse circulation
RCRA	Resource Conservation and Recovery Act
REA	Rapid Ecoregional Assessment
RFFA	reasonably foreseeable future actions
RMP	Resource Management Plan
ROM	run-of-mine
RPP	Recreation and Public Purpose
RV	recreational vehicle
Sb	antimony
SDC	Seismic Design Category
sg	specific gravity
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO <sub>2</sub>	sulfur dioxide
SWMP	Storm Water Management Plan
TCP	Traditional Cultural Property
TIC	total inorganic carbon
Title V	federal air quality operating permit
TFO	Tonopah Field Office
TPU	Tonopah Public Utilities
tpy	tons per year
TRI	Toxics Release Inventory
UBC	Uniform Building Code
US	United States
USBM	United States Bureau of Mines
USC	United States Code
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service

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V	Vertical
Vista	Vista Gold Inc.
VOCS	volatile organic compounds
VRM	Visual Resource Management
WKM	WK Mining (USA) Ltd.
WSA	Wilderness Study Area
WPCP	Water Pollution Control Permit
WRC	Wildlife Resources Consultants
WRCC	Western Regional Climate Center
WRSA	waste rock storage area

**WK MINING (USA) LTD.  
THREE HILLS MINE PROJECT  
ENVIRONMENTAL ASSESSMENT**

## **1 INTRODUCTION**

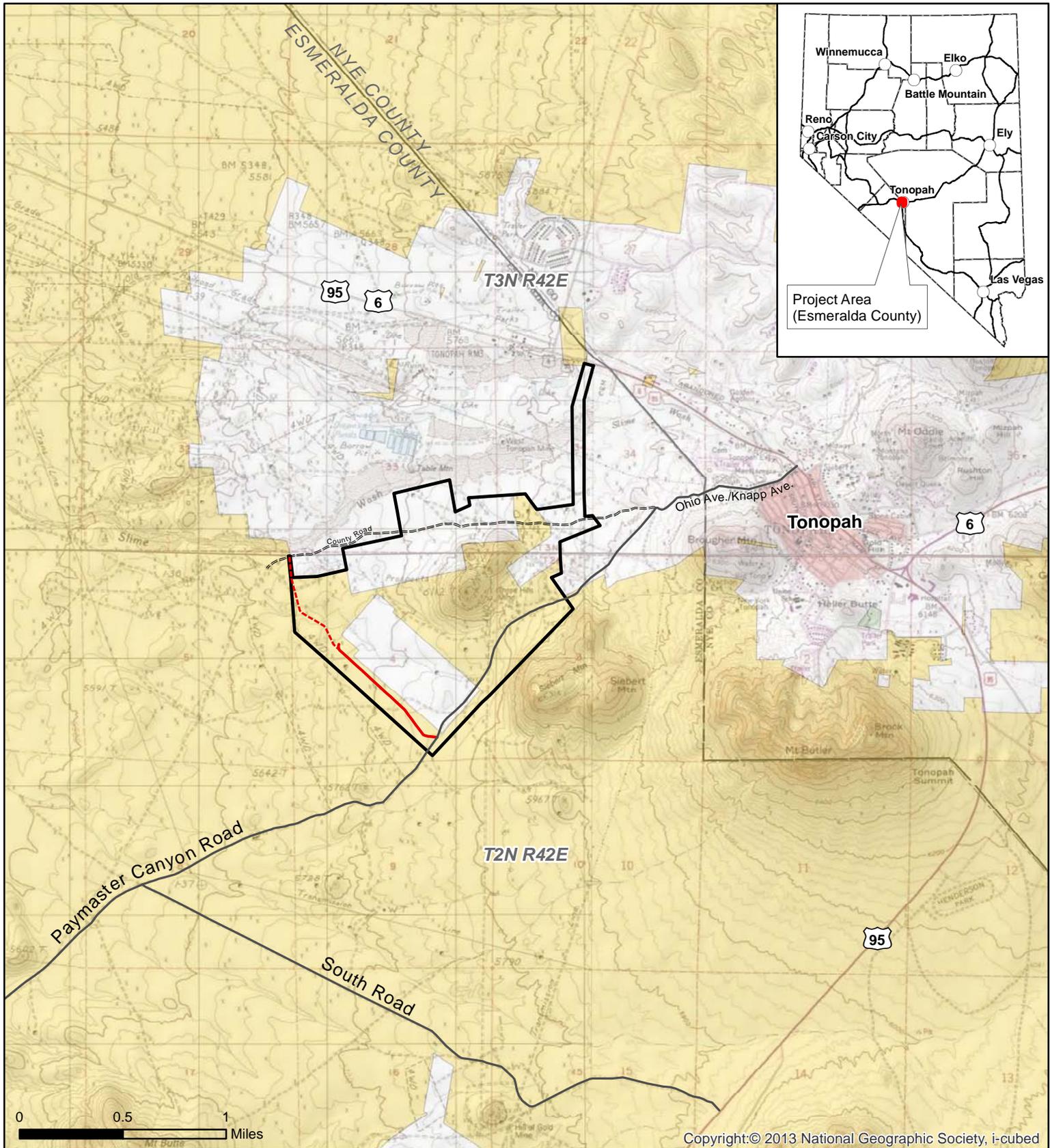
WK Mining (USA) Ltd. (WKM) plans to develop the Three Hills Mine Project (Project) in west central Nevada approximately one mile west of the Town of Tonopah, Nevada. The Project is located on public lands administered by the Bureau of Land Management (BLM) Tonopah Field Office (TFO) and private lands controlled by WKM in Esmeralda County, Nevada. The specifics of the Project are outlined in the combined Three Hills Mine Plan of Operations N-93515/Nevada Reclamation Permit (NRP) Application (Mine Plan) submitted to the BLM and Nevada Division of Environmental Protection (NDEP) Bureau of Mining Regulation and Reclamation (BMRR) in November 2014, and revised in July 2015, which is on file and available for review at the BLM TFO in Tonopah, Nevada, during normal business hours. In addition, one right-of-way (ROW) application and associated Plan of Development (POD) for activities associated with the Project have been proposed. The ROW is for the realignment of the AT&T fiber optic cable (N-73706). The ROW application and POD are on file and available for review at the BLM TFO in Tonopah, Nevada, Monday through Friday, 7:30 a.m. to 4:30 p.m., except holidays. In addition, United States (US) Highway 95 at the junction with the South Access Road would be modified within the existing Nevada Department of Transportation (NDOT) ROW to provide for acceleration and deceleration lanes.

The Project and associated activities are located in portions or all of Sections 33, and 34, Township 3 North, Range 42 East (T. 3 N., R. 42 E.), and Sections 3, 4, 5, and 14, T. 2 N., R. 42 E., Mount Diablo Base and Meridian (MDB&M) (Project Area) (Figure 1.1.1). The Project Area is comprised of approximately 722 acres, of which 379 acres are public land administered by the BLM. Approximately 343 acres within the Project Area are private land controlled by WKM (Figure 1.1.1). The proposed highway modifications within the existing NDOT ROW comprise one acre of surface disturbance on public lands.

The Plan was submitted in accordance with BLM Surface Management Regulations at 43 Code of Federal Regulations (CFR) 3809, as amended, Nevada reclamation regulations at Nevada Administrative Code (NAC) 519A, as amended, and surface occupancy under 43 CFR 3715. The combined acres of existing and proposed disturbance on BLM administered land and private land would exceed the regulatory threshold of five acres, thereby requiring the submittal of this Plan. The format for this Plan is consistent with the NRP application form, which has been determined to be acceptable to the BLM for their plans of operations in accordance with the Memorandum of Understanding (MOU) between the BLM, NDEP, and United States Forest Service (USFS), as well as BLM Instruction Memorandum (IM) #NV-2011-004.

AT&T submitted their ROW application and POD for their ROW modification. The ROW application and POD was submitted in accordance with 43 CFR 2800, as amended.

In general, the proposed operations under this Plan, ROW, and POD would consist of an open pit mine and waste rock storage areas (WRSAs) on public lands, and processing of ore using heap leach technology on private land. The Project would include the following major components:



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**Explanation**

- Project Area
- Existing Access Routes
- County Road
- Proposed Project Access Road
- Proposed County Road Bypass

**Land Status**

- Bureau of Land Management
- Forest Service
- Private



BATTLE MOUNTAIN DISTRICT OFFICE  
 Tonopah Field Office  
 1553 South Main Street  
 Tonopah, Nevada 89049

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**BUREAU OF LAND MANAGEMENT**

**THREE HILLS MINE PROJECT**

**Proposed Action Location, Access, and Land Status**

Figure 1.1.1

10/07/2015

- One open pit;
- WRSAs;
- Run-of-mine (ROM) ore placement;
- A heap leach pad with associated process water tanks and an Event Pond;
- An Absorption-Desorption-Recovery (ADR) processing plant;
- A refinery;
- Exploration;
- A lime silo;
- A water supply pipeline and associated water delivery pipelines;
- On-site power generation and distribution system;
- Access and haul roads;
- Ancillary facilities that include the following: haul, secondary, and exploration roads; ready line; maintenance area; storm water diversions; sediment control basins; reagent and fuel storage; storage and laydown yards; prill silo and explosive magazines; fresh water storage; monitoring wells; meteorological station; an administration/security building; borrow areas; growth media stockpiles; and solid and hazardous waste management facilities to manage wastes;
- Reclamation and closure, including the development of an evapotranspiration (ET) cell;
- Realignment of an existing buried fiber optic cable; and
- Modifications to US Highway 95 at the junction with the South Access Road.

WKM proposes to mine between approximately ten and 16 million tons (Mt) of heap leach ore and between 9.8 and 11.7 Mt of waste rock (for a maximum total of 27.7 Mt of material). The material (both ore and waste) would be extracted from the open pit using conventional open pit mining methods of drilling, blasting, loading, and hauling. WKM would use hydraulic shovels or front end loaders to load the ore and waste into the haul trucks. The haul trucks would transport the waste rock to the WRSAs near the open pit, and transport the ROM ore to the heap leach pad located on private land. Once placed on the heap leach pad on private land, the ore would be leached with a dilute cyanide solution to dissolve the precious metals into a “pregnant” leach solution. The pregnant solution would then be processed for metal recovery and further off-site refining. The subsequent barren solution would then be recirculated. Exploration activities, expected to disturb up to ten acres, would occur within the Project Area. The acreage of proposed new surface disturbance associated with the Project would be approximately 459 acres, of which 214 acres are on public land and which includes the realignment of the fiber optic cable (Proposed Action).

The proposed mining activities, which would be located on public lands and would be subject to BLM review and approval pursuant to the Federal Land Policy and Management Act of 1976 (FLPMA) and subsequent surface management regulations (43 CFR 3809), as well as ROW principals and procedures (43 CFR 2800). These activities constitute a federal action and would thus be subject to the National Environmental Policy Act (NEPA). The BLM has determined that an environmental assessment (EA) is to be prepared to fulfill the NEPA requirements. In determining the scope of the Proposed Action, the BLM has determined that actions on private lands are connected actions with those proposed on public lands (40 CFR 1502.4 and 40 CFR 1508.25 (a)).

The EA has been prepared by the BLM, the Lead Agency with respect to compliance with NEPA and its implementing regulations, and with the following cooperating agencies: Esmeralda County, Nevada Department of Wildlife (NDOW), and Nye County.

### **1.1 Background and History**

Silver and gold mineralization was first discovered in the Tonopah-Divide Mining District in 1900. Although several mines were eventually developed, by 1929 all mining and production had ceased within the District due to low metal prices and an economic downturn. In 1969, Hughes Tool Company (Hughes) acquired most of the historic claims within the District with the intention of undertaking a precious and base metal exploration program. The claims were sold to Houston Oil and Minerals Corporation (later acquired by Tenneco) when Hughes divested itself of its mining interests in the mid-1970s.

Echo Bay Mines Ltd. acquired then Tenneco claims and later sold them to Vista Gold Inc. (Vista) in the early 1990s. Vista's 2006 merger with Allied Nevada Gold Corporation (ANGC) resulted in the swapping of Vista's Nevada mineral claims (including the Three Hills claims) for ANGC stock.

The Proponent purchased and is now the owner of the Three Hills and the nearby Hasbrouck claims located south of the Project Area from ANGC in April 2014, with ANGC retaining a 25 percent interest in the Project. In 2015 ANGC's 25 percent interest in the Project was purchased by Waterton Global Resource Management.

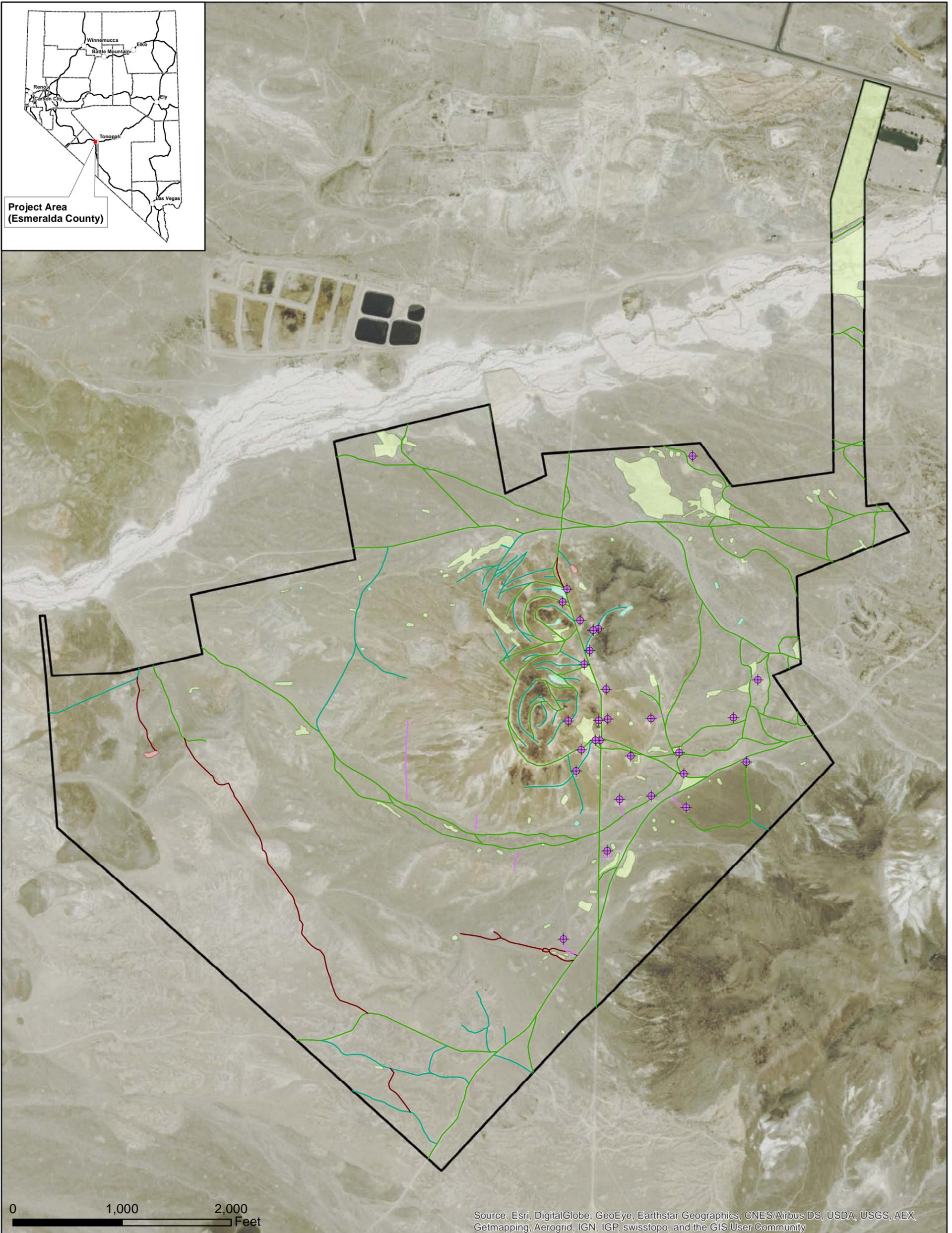
### **1.2 Existing Operations**

Approximately 152 acres within the Project Area were previously disturbed by activities associated with historic precious metal exploration and mining prior to any activities by WKM. This disturbance includes underground mines, dewatering slimes that discharged to a drainage, tailings, garbage disposal, roads, WRSAs, and exploration drill pads (Figure 1.1.2). Surface disturbance from the 1990 includes exploration drill roads and pads. None of this surface disturbance would be reclaimed under the Plan, except for that existing surface disturbance that is coincident with the proposed structures under the Plan.

WKM currently has 4.88 acres of existing Notice-level surface disturbance on public lands under the Three Hills Notice N-91216. Figure 1.1.2 shows existing surface disturbance by previous operators within the Project Area prior to 1981, and between 1981 and 1990. Figure 1.1.2 also shows post-1990 disturbance by previous operators and WKM's Notice-level surface disturbance within the Project Area. Notice N-91216 would be subsumed and retired by the Mine Plan authorization.

### **1.3 Purpose and Need for Action**

The BLM is responsible for administering mineral rights access on certain federal lands as authorized by the Mining Law. Under the Mining Law, qualified prospectors are entitled to reasonable access to mineral deposits on public domain lands, which have not been withdrawn from mineral entry. In addition, under Section 501 of the FLPMA, the BLM is authorized to issue ROWs on public lands. Under this law, and the implementing regulations at 43 CFR 2800, qualified individuals can obtain ROWs on public lands.



**Explanation**

- Project Area
- ◆ WK Mining Notice Disturbance
- Disturbance Year**
- Pre-1981
- 1981-1990
- Post-1990
- Pre-1981
- 1981-1990
- Post-1990
- WK Mining Notice Disturbance

1981 disturbance based on 06/12/1981 USGS Earth Resources Observations and Science Center single frame aerial photography  
 1990 disturbance based on 05/29/1994 Google Earth USGS aerial photography



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**BUREAU OF LAND MANAGEMENT**

**THREE HILLS MINE PROJECT**

**Existing Surface Disturbance**

Figure 1.1.2

10/07/2015

The purpose of the Proposed Action is to provide WKM the opportunity to explore, locate, and delineate precious metals (gold and silver) deposits, and to extract economically recoverable gold and other minerals determined to exist in the Project Area, on its mining claims on public lands as provided under the General Mining Law of 1872 as amended (Mining Law). The purpose for the Proposed Action also includes actions by others (i.e., AT&T) that facilitate WKM's activities. The proposed Project need is to meet the prevailing market demand for gold. The prevailing market demand is regularly adjusted by commodity exchanges throughout the world. This adjustment results from buyers and sellers agreeing on a specific transaction price, which reflects the current supply and demand for the commodity and other factors.

The need for the federal action is established by BLM's responsibilities under the FLPMA to respond to the request for a plan of operations for the applicant to exercise their rights under the Mining Law, and an application for a ROW amendment. Additional aspects of the need for the federal action include the following: 1) to further the "Minerals" objective of the applicable BLM resource management plan (RMP), which is to "provide opportunity for exploration and development of locatable minerals, such as gold, copper, lead, molybdenum, etc., consistent with the preservation of fragile and unique resources in areas identified as open to the operations of the mining laws" (BLM 1997); and 2) to provide for mining and reclamation of the proposed Project area in a manner that is environmentally responsible and in compliance with federal mining laws, including preventing unnecessary or undue degradation of public lands, the FLPMA, Nevada mine reclamation laws, and other applicable laws and regulations.

#### **1.4 Decision to Be Made**

The decisions the BLM would make based on this EA include any of the following: 1) approval of the proposed Plan and ROW to authorize the mining, exploration, and other activities without modifications or additional mitigation measures; or 2) approval of the Plan and ROW with additional mitigation measures deemed necessary by the BLM; or 3) deny approval of the Plan and ROW and not authorize the mining and exploration activities if it is found the proposal does not comply with the 3809 regulations and the FLPMA mandate to prevent unnecessary or undue degradation. The BLM's TFO Manager would decide whether to permit the proposed Project as described within the Mine Plan, as submitted, or modify the decision based on the potential unnecessary or undue degradation, impacts analysis, and associated mitigation, as identified in this EA.

#### **1.5 Land Use Plan Conformance Statement**

The BLM has the responsibility and authority to manage the surface and subsurface resources on public lands located within the jurisdiction of the BLM TFO. The BLM has designated lands within the Project Area as open for mineral exploration and development. In its Record of Decision (ROD) for the Tonopah RMP (BLM 1997), the BLM objective for locatable minerals is:

"To provide opportunity for exploration and development of locatable minerals, such as gold, silver, copper, lead, molybdenum, etc., consistent with the preservation of fragile and unique resources in areas identified as open to the operations of the mining laws."

A Plan of Operations and a Reclamation Plan are required in situations in which there would be more than five acres of cumulative unreclaimed surface disturbance in a Plan of Operations area.

The Proposed Action and the Alternatives are in conformance with the Tonopah RMP and ROD, approved on October 6, 1997 (BLM 1997). "A total of 6,028,948 acres (99 percent of the Tonopah Planning Area) would be open to the operation of the mining laws" (page 23). The "BLM provides for mineral entry, exploration, location and operations pursuant to the mining laws in a manner that 1) would not unduly hinder the mining activities, and 2) assures that these activities are conducted in a manner which would prevent undue or unnecessary degradation of the public land" (page 35). "All operations shall comply with all federal and state laws, including those relating to air quality, water quality, solid waste, fisheries, wildlife and plant habitat, and archeological and paleontological resources" (page 36).

Sustainable development is an important concept that ensures human well-being, meeting the needs of present and future generations, while respecting ecosystem health and the earth's environment. The primary guiding laws for managing public lands are FLPMA and the NEPA, both of which support the concept of sustainable development. FLPMA requires that land use plans "observe the precepts of multiple use and sustained yield" (Sec. 202 [c] [1]), while protecting the quality of scientific, scenic, historical, ecological, and environmental values (Sec. 102 [8]). NEPA encourages the use of "practical means and measures to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony and fulfill the social economic and other requirements of present and future generations" (Sec.101 [A]). In an effort to address public concerns regarding the social and economic resiliencies and sustainability of local economies the Battle Mountain District (BMD) has incorporated sustainable development goals, objectives, and management actions into this EA. The BLM's focus is to contribute to sustaining local economies while maintaining or improving ecosystem health of the lands.

Management actions which may address sustainable development concerns after the cessation of active mining include the following:

- Allow for reuse of public lands including reuse of infrastructure by issuing use authorizations subject to applicable laws, regulations, and policy;
- Authorize ROWs or Recreation and Public Purpose (RPP) leases on public lands to facilitate post-operation reuse and encourage sustainable development. Consider the following criteria prior to authorizing reuse proposals on public lands:
  - Develop an MOU with Esmeralda and Nye Counties to establish roles and responsibilities to facilitate community input into the reuse of public lands; and
  - Partner with local governments and communities to identify and target sustainable development strategies.

Mining-related facilities may be available for reuse in compliance with law, regulation, policy, and reclamation requirements, in consultation with the NDEP, and subject to the criteria for reuse. Facilities such as buildings, roads, powerlines, etc., would remain available for reuse up to a maximum of five years from the end of active mining, after which if no reuse actions are pending or ongoing, facilities would be removed and/or rehabilitated, per regulatory requirements (3809 regulations). Any post-mining activity would be subject to NEPA and may require additional environmental analysis.

## **1.6 Relationship to Other Statutes, Regulations, and Plans**

### **1.6.1 Federal Requirements**

WKM proposes to undertake activities as part of the Plan under the authority of the FLPMA (43 US Code [USC] §302(b)). Other federal statutes, regulations, executive orders (EO), and plans that must be complied with include:

- American Indian Religious Freedom Act 1978 (42 USC 1996);
- Archaeological Resources Protection Act of 1979 (16 USC 470a to 47011);
- Clean Air Act, as amended (42 USC 7401 et seq.);
- Clean Water Act of 1977 (33 USC 1251 et seq.);
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (42 USC 9615);
- Council on Environmental Quality (40 CFR §1500);
- Eagle Protection Act (16 USC §668-668d);
- EO 11988, as amended, Floodplain Management, May 24, 1977;
- EO 11990, Protection of Wetlands, May 24, 1977;
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994;
- EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, January 10, 2001;
- Endangered Species Act of 1973, as amended (16 USC 1531);
- Magnuson-Stevens Act Provision: Essential Fish Habitat: Final Rule (50 CFR Part 600; 67 Federal Register (FR) 2376, January 17, 2002);
- Migratory Bird Treaty Act of 1918, as amended (16 USC 703 et seq.);
- National Environmental Policy Act of 1969 (42 USC 4321 et seq.) (NEPA);
- National Historic Preservation Act (NHPA), as amended (16 USC 470);
- Omnibus Public Lands Act of 2009-Paleontological Resources Preservation (OPLA-PRP); P.L. 111-11, Title VI, Subtitle D, Sections 6301-6312, 123 Stat. 1172, 16 USC 470a;
- Public Rangelands Improvement Act of 1978;
- Resource Conservation and Recovery Act of 1976 (42 USC 6901 et seq.);
- Safe Drinking Water Act, as amended (42 USC 300 et seq.);
- Surface Management (43 CFR §3809 et seq.);
- Wild and Scenic Rivers Act as amended (16 USC 1271); and
- Wilderness Act of 1964 (16 USC 1131 et seq.).

### **1.6.2 Surface Management Authorizations and Plans**

The BLM is responsible for administering mineral rights on certain federal lands as authorized by the Mining Law. Under the Mining Law, qualified applicants are entitled to reasonable access to mineral deposits on public domain lands that have not been withdrawn from mineral entry. BLM authority derives from the FLPMA. BLM regulations for Surface Management (of mining) in 43 CFR 3809 were promulgated in 1981 and revised in 2001, and derive their mandate from Sections 302 and 303 of the FLPMA. WKM submitted their Mine Plan for the proposed Project as required by 43 CFR 3809 regulations. In order to use public land administered by the TFO, WKM must comply with the BLM Surface Management Regulations (as amended) (43 CFR

3809) and other applicable statutes, including the Mining and Mineral Policy Act of 1970 (as amended) (MMPA) and the FLPMA. The BLM has the authority to manage the surface and subsurface resources on public land located within the jurisdiction of the TFO.

The Mining Law allows individuals to locate and patent mining claims, such as lode claims. Since 1994, Congress has maintained a moratorium on BLM processing of mineral patent applications. Under the mill site provision, 30 USC 42, no location of a claim on non-mineral lands, called mill sites, may exceed five acres each. Under 43 CFR 3832.32, the maximum size of an individual mill site is five acres; however, more than one mill site per mining claim can be located if each site is used for at least one of the purposes described in 43 CFR 3832.34. The amount of located mill site acreage is that which is reasonably required for use or to be occupied for efficient and reasonably compact mining or milling operations. Section 501 of the FLPMA and 43 CFR 2800 regulations allow individuals to use public lands for powerlines, as well as other linear features (i.e., roads, pipelines, etc.), through the issuance of a ROW by the BLM. The BLM must review WKM's plans for developing the proposed Project to ensure the following:

- Adequate provisions are included to prevent unnecessary and undue degradation of federal lands;
- Measures are included to provide for reclamation of disturbed areas; and
- Proposed Project activities comply with all applicable state and federal laws.

The BLM has reviewed WKM's Mine Plan and has prepared this EA to ensure compliance with these surface management requirements and the requirements of NEPA.

### **1.6.3 Site Reclamation Requirements**

The BLM's long-term reclamation goals are to shape, stabilize, revegetate, or otherwise treat disturbed areas in order to provide a self-sustaining, safe, and stable condition providing productive use of the land, which conforms to the approved land use plan for the area. The BLM's long-term goals also include management of discharges from process components. The short-term reclamation goals are to stabilize disturbed areas and to protect both disturbed and adjacent undisturbed areas from unnecessary or undue degradation. Relevant BLM policies and standards for reclamation are set forth in the BLM Solid Minerals Reclamation Handbook (BLM 1992a), which provides consistent reclamation guidelines for all solid non-coal mineral activities conducted under the authority of the BLM Minerals Regulations in Title 43 CFR 3809. The BLM has reviewed the site reclamation portions of the Plan to ensure the Project would meet BLM reclamation standards and goals.

### **1.6.4 Cyanide Management Plan Requirements**

The BLM's national cyanide management policy requires that BLM state offices prepare a Cyanide Management Plan. The Nevada State Office of the BLM has prepared and continues to administer the Nevada Cyanide Management Plan (BLM 1991). The Nevada Cyanide Management Plan is applicable to all public lands administered by the BLM in Nevada and would be applicable to the Project cyanide heap leaching activities, relevant precious metal

recovery processes, and tailings facility. The Nevada Cyanide Management Plan provides guidance on cyanide use in mining activities and lists the following objectives:

- Implement the BLM’s national cyanide management policy;
- Ensure that mining operations using cyanide on BLM-administered lands follow Best Management Practices (BMPs) and do not cause unnecessary or undue degradation of the federal lands;
- Provide both the mine operator and the BLM technical staff with standards for development and evaluation of mining projects that use cyanide; and
- Use state standards, if established.

The Nevada Cyanide Management Plan is not intended to duplicate requirements of other federal or state agencies with responsibility for managing the use of cyanide in mining operations. Where standards are established for mining operations by the State of Nevada through the NDEP BMRR, they shall apply when reviewing a notice or a plan. The BLM has reviewed the Mine Plan to ensure that it is in conformance with the Nevada Cyanide Management Plan.

### **1.6.5 Esmeralda County Public Lands Policy Plan**

Esmeralda County, in cooperation with the Division of State Lands, has adopted a Policy for Public Lands within its jurisdiction. The Esmeralda County Public Lands Policy Plan (ECPLPP) (Esmeralda County 2013) was developed in response to Nevada Senate Bill 40, which directs the State Land Use Planning Agency to “prepare, in cooperation with appropriate state and local governments throughout the state, plans, or policy statements concerning the use of land in Nevada, which are under federal management.” Included in the ECPLPP are processes to encourage communication and cooperation between federal, state, and local governments, and include policies that are “intended to help resolve the County’s public land issues.” Policies 7-1 and 7-3 promote the expansion of mining operations/areas and are outlined in pages 13 and 14 of Section 3 pertaining to the development of Minerals and Geothermal Resources. Policies that address ROWs can be found on pages 28 and 29 within Section 3 of the ECPLPP. Some elements of the Proposed Action would be in conformance with ECPLPP plans and policies while other elements of the proposed mine may prove inconsistent with these plans and policies. The BLM acknowledges that WKM would have to comply with any applicable Esmeralda County codes.

### **1.7 Scoping and Issues**

The Project was internally scoped by the BLM Interdisciplinary team at a meeting held on April 30, 2015, at the BLM TFO. During this meeting, BLM resource specialists identified the elements associated with supplemental authorities, and other resources and uses to be addressed in this document as outlined in Chapter 3 of this EA. Issues and impacts related to specific resources associated with the Proposed Action were identified:

- Air Quality;
- Cultural;
- Fire Management;
- Geology and Minerals;
- Lands and Realty;
- Migratory Birds;
- Native American Concerns;
- Noise;
- Noxious Weeds, Invasive and Non-native Species;
- Paleontology;
- Public Safety;
- Rangeland Management;
- Recreation;
- Socioeconomics;
- Soils;
- Special Status Species;
- Transportation/Traffic;
- Vegetation;
- Visual;
- Wastes, Hazardous or Solid;
- Water Quality, Surface and Ground; and
- Wildlife.

In addition, a public meeting was held on Thursday, April 30, 2015. Four members of the public attended the meeting and concerns involving the adequacy of the Town of Tonopah’s water supply and water quality were raised.

### 1.8 Required Permits

In addition to the EA, implementing the Proposed Action would require authorizing actions from other federal, state, and local agencies with jurisdiction over certain aspects of the proposed Project. Table 1.7-1 lists the required permits or approvals that are already in place or would be obtained and the responsible regulatory agencies. WKM is responsible for amending existing permits, and applying for and acquiring additional permits, as needed.

**Table 1.7-1: Major Permits and Authorizations Required for Project Development**

Permit	Regulatory Agency
Plan of Operations/Record of Decision	United States Department of the Interior, BLM
Explosives Permit	United States Department of the Treasury, Bureau of Alcohol, Tobacco, Firearms, and Explosives
Air Quality Operating Permits	NDEP, Bureau of Air Pollution Control (BAPC)
Water Pollution Control Permit	NDEP, Bureau of Mining Regulation and Reclamation
Reclamation Permit	NDEP, Bureau of Mining Regulation and Reclamation
Industrial Artificial Pond Permit	NDOW
Hazardous Materials Storage Permit	State of Nevada, Fire Marshall Division
Hazardous Waste Identification Number	United States Environmental Protection Agency

<b>Permit</b>	<b>Regulatory Agency</b>
Encroachment Permit	Nevada Department of Transportation
Project Notification	Esmeralda County
Authorization to Temporarily Close a County Road	Esmeralda County
Road Maintenance and Hold Harmless Agreement	Esmeralda County
Roadway Use and Damage Remediation Agreement	Nye County

## 2 ALTERNATIVES INCLUDING THE PROPOSED ACTION

### 2.1 Proposed Action

Under the Proposed Action, WKM would conduct mining and exploration-related activities that would result in a maximum of approximately 459 acres of surface disturbance subject to reclamation, up to approximately 16 million tons of heap leach ore, up to approximately 12 million tons of waste rock, and the recovery of up to approximately 570,000 ounces of gold. Proposed activities and facilities would consist of the following: one open pit; two WRSAs; ROM ore placement; a heap leach pad with associated process water tanks and an Event Pond; an ADR processing plant; a refinery; a lime silo; a water supply pipeline and associated water delivery pipelines; an on-site power generation and distribution system; access and haul roads; ancillary facilities; exploration; and reclamation and closure, including the development of an ET cell. The Proposed Action also includes a reroute of the existing AT&T fiber optic cable that currently crosses the center of the Project Area in a general north-south direction, as well as the use of existing roads in Esmeralda and Nye Counties. Other activities analyzed as part of the Proposed Action as a connected action is the modification of US Highway 95 at the junction with the South Access Road.

The authorized and proposed surface disturbance is outlined by each type of facility and/or activity in Table 2.1-1. The proposed facilities are shown on Figure 2.1.1.

**Table 2.1-1: Surface Disturbance for the Authorized and Proposed Project Facilities**

Component	Total Disturbance		
	Public Acres	Private Acres	Total Acres
Open Pit, including adjustment zone <sup>1</sup>	57.3	17.0	74.3
Waste Rock Storage Areas	61.5	51.4	112.9
Heap Leach Facility	0	88.8	88.8
Buildings and Yards <sup>2</sup>	33.8	33.1	66.2
Haul Roads	19.4	8.0	27.4
Access Road	6.1	0	6.1
Water Pipeline <sup>3</sup>	1.9	3.7	5.6
Pond	0	2.6	2.6
Septic Field	1.4	0	1.4
Fence <sup>4</sup>	7.4	7.3	14.7
Borrow Areas	6.6	9.1	15.7
Diversion Ditches	2.5	0.7	3.2
Growth Media Stockpiles	10.3	18.1	28.4
Exploration <sup>5</sup>	5.0	5.0	10.0
US Highway 95 Modification	1.0	0	1.0
Fiber Optic Cable Reroute <sup>6</sup>	0.1	0.1	0.2
<b>Total</b>	<b>214.3</b>	<b>244.9</b>	<b>458.5</b>

1 – This acreage on public lands incorporates the existing Notice-level surface disturbance.

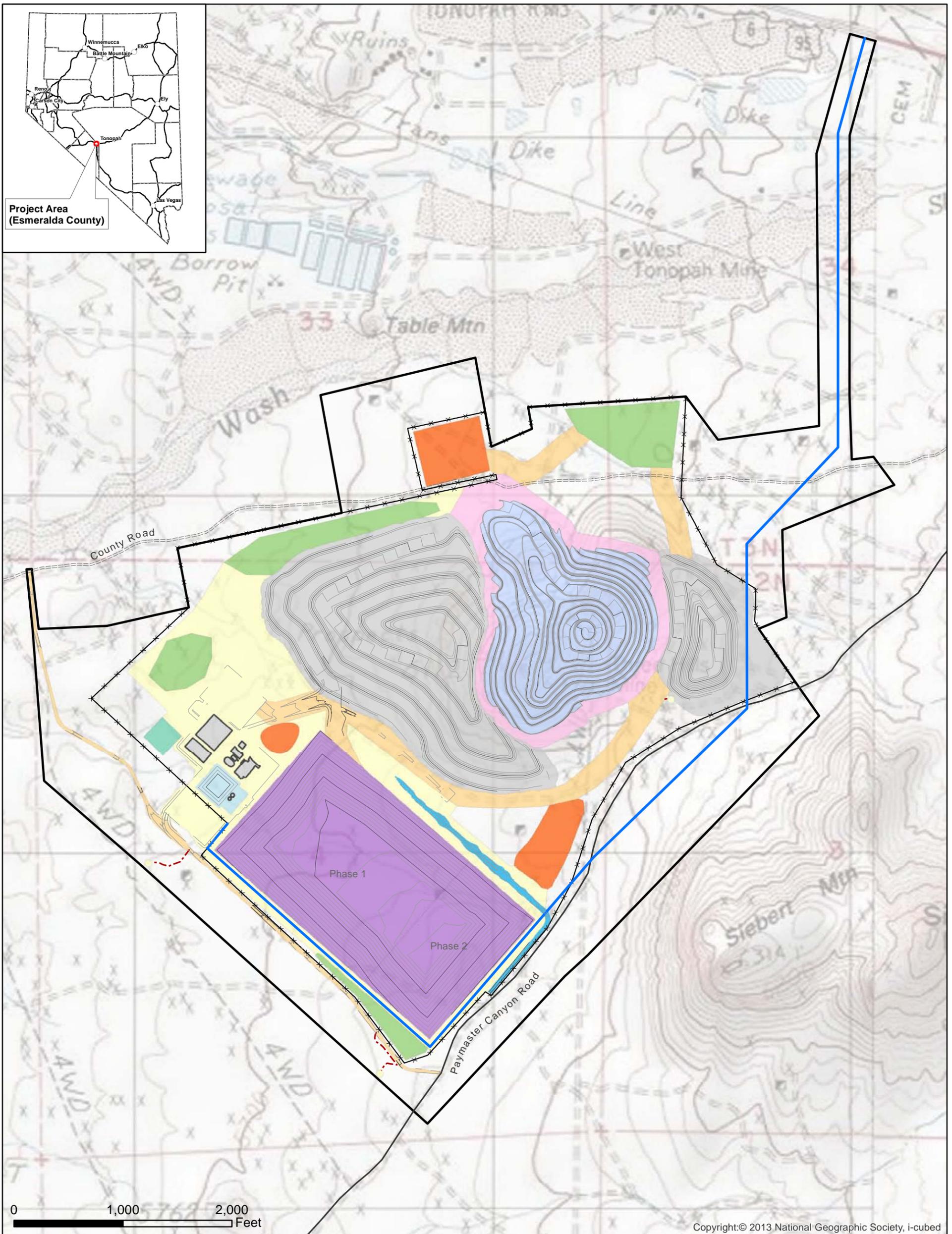
2 – This includes the ADR plant, administrative building, parking lot, security building, mining contractor yard, reagent storage, assay laboratory, and power plant.

3 – Includes the water pipeline at 8,151 feet with a 30-foot disturbance width.

4 – Includes the perimeter fence at 21,448 feet with a 30-foot construction disturbance width.

5 – Actual location of exploration within the Project Area is currently unknown and, therefore, equally divided.

6 – Includes the fiber optic cable reroute trench at 4,240 feet with a six-inch disturbance width.



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**Explanation**

- Project Area
- Water Line
- Fence
- Mine Road
- County Road
- Public Road
- Borrow Source
- Waste Rock Storage Area
- Growth Media Stockpile
- Mine Road
- Heap Leach Pad
- Pit
- Pit Adjustment Zone
- Septic Field
- Stormwater Diversion Channel
- Yard
- Structure
- Pond



BATTLE MOUNTAIN DISTRICT OFFICE  
 Tonopah Field Office  
 1553 South Main Street  
 Tonopah, Nevada 89049

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**BUREAU OF LAND MANAGEMENT**

**THREE HILLS MINE PROJECT**

**Proposed Facilities Layout**

Figure 2.1.1

10/07/2015

## 2.1.1 Mining Operations

### 2.1.1.1 Open Pit Mining Method

WKM would generally construct the open pit in phases or push-backs (lay-backs), which are practical expansions of an open pit that incorporates a proper equipment operating room, working geometries of the pit walls and pit wall rock formations, and access roads. The open pit would be excavated from the top of a hill, the current elevation of which is 6,117 feet above mean sea level (amsl). When mining is complete, the highest elevation of the pit would be the east wall at 5,964 feet amsl, indicating a reduction in the level of the ground surface by 153 feet. The pit bottom elevation would be approximately 5,440 feet amsl, which would result in an eastern highwall of approximately 524 feet. The north end of the open pit would have the shallowest wall, with a height of 52 feet between the crest of the pit, and the 5,680-foot bench. WKM conducted ground water characterization investigations that established the ground water table at an elevation of approximately 4,956 feet amsl; therefore, a pit lake is not expected to develop within the pit. Pit backfill is not anticipated at this time due to economics and scheduling. The deposit contains approximately 28 Mt of ore and waste rock that would be extracted over an approximate two-year period.

The combined mining rate of ore and waste would average 45,000 tons per day over the life of the mine. The maximum average mining rate of 100,000 tons per day would occur during periods of waste rock stripping. A total of approximately 30 Mt of material would be mined from the open pit. Slope angles within an open pit mine are influenced by rock strength, geologic structure, hydrology, pit wall orientation, and operational considerations. The open pit was subdivided into design sectors and a stability analysis was conducted on single bench height vertical face geometries to determine the combined impact of structurally controlled plane shear and wedge failures on the bench face. Based on this analysis, the pit wall slopes would range from 35 degrees to 45 degrees.

Conventional open pit mining (truck and shovel) would be used to extract ore and waste rock from the proposed open pit. Drilling and blasting would be used to break the rock prior to excavation. Ore would be loaded into haul trucks for transport to the heap leach pad. Waste rock would be hauled to the WRSAs for permanent placement. A list of the anticipated mobile equipment requirements for the proposed mining operation is provided in Table 2.1-2. Vehicles may be upgraded over time as larger, more efficient equipment is developed.

**Table 2.1-2: List of Proposed Mine Mobile Equipment**

Equipment <sup>1</sup>	Typical Number of Units
Loaders (992-sized or similar)	2
Haul Trucks (CAT 777 or similar)	6
Dozer (CAT D8 or D9)	1
Dozer (CAT D10)	1
Grader (CAT 14M or similar)	1
Water Truck (20,000 – 30,000 gallon size)	1
Extendable Boom Forklift	2
Blast Hole Drill Rig	2
Flatbed Truck	2

Equipment <sup>1</sup>	Typical Number of Units
Skid-steer loader (Bobcat or similar)	1
Diesel Light Unit	4
Pick-up Trucks	6
Service Truck	1
Fuel/Lube Truck	1
Crane, 50-ton, All-terrain	1

<sup>1</sup>The equipment types listed are general and intended only to provide an indication of the sizes and numbers that will be used; substitutions or additions may be made as necessary.

Surface mining would require drilling blast holes by using diesel-powered blast hole drill rigs. Blasting would utilize a mixture of ammonium nitrate and fuel oil (ANFO), or would be utilized in slurry form during wet conditions. Blasting would be performed only during daylight hours and under strict safety procedures as required by the Mine Safety and Health Administration (MSHA). Ore and waste rock material would generally require drilling and blasting prior to mining. Rock would be drilled and blasted on approximate 40-foot mining benches or other bench heights depending on the blasting requirements and capabilities.

Explosives would be handled by licensed personnel and stored on site in compliance with the applicable Department of Homeland Security (DHS), Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF), and MSHA regulations. Federal, state, and county roads/highways would be used to transport explosives and other mining materials. All shippers would be licensed by the NDOT and other appropriate agencies.

### 2.1.2 Waste Rock Storage Areas

Two WRSAs would be constructed over the life of the Project to store the approximately 19.9 Mt of material. In-pit roads and haul roads would connect the open pits with the WRSAs by a series of road segments. The area underlying the WRSAs would be cleared and grubbed prior to construction.

Waste rock in the Three Hills deposit is non-acid generating. This assessment is based on the information in the Baseline Geochemistry Report, which is included as Appendix F in the Mine Plan, and discussed further in Section 3.22 of this EA. As a result, the waste rock would be managed as a single unit with random placement in the WRSAs.

Waste rock would be placed in approximate 50-foot lifts by end dumping from haul trucks at the angle of repose (approximately 1.5 horizontal [H]:1 vertical [V], or 34 degrees). Catch benches would be approximately 76 feet wide to achieve overall operating slopes of 3H:1V. The ultimate geometry was modeled to a maximum design height of 240 feet. The WRSAs would be reclaimed so that slopes are 3H:1V or flatter. This geometric design or configuration would also minimize the amount of reclamation grading that would be required to smooth out the WRSAs to a 3H:1V slope that approximates surrounding topography at the end of the mine life.

Concurrent reclamation would be ongoing over the life of the mine. In the early years of mining, growth media salvage would be undertaken and would include growth media removal (for WRSA placement preparation). Growth media would be stockpiled for future reclamation. Beginning in Year 2 the west WRSA would be contoured to an overall slope of 3H:1V.

Concurrent reclamation of the WRSA is not possible earlier than Year 2 since all areas would be active and not at final buildout. WKM anticipates that WRSA contouring to an overall slope of 3H:1V would continue from Year 2 to approximately Year 4.

Growth media would be placed and followed by seeding as soon as practicable after contouring efforts were complete. WRSA reclamation would be considered complete once revegetation meets the requirements of NAC 519A and BLM requirements (BLM 1999).

The WRSA surfaces would be graded to control runoff and engineered diversions would be installed as necessary for erosion control and rerouting of the surface water features. In addition, the WRSAs would be visually monitored to ensure drainage and sediment control measures are effective.

Temporary sediment control structures would be designed and constructed as part of the incremental development of the WRSAs and would be sized appropriately for the ten-year, 24-hour storm event. These structures would require maintenance and would be reclaimed as part of closure activities when no longer needed.

Sediment control structures are discussed further in Section 2.1.8.4, and in the Storm Water Management Plan (SWMP) (Appendix O of the Mine Plan).

### **2.1.3 Heap Leach Process**

The heap leach facility (HLF) for the Project includes a single heap leach pad, an Event Pond containing a barren solution tank and a pregnant solution tank, and an ADR processing facility. The HLF has been designed to contain leach material and solution in accordance with NAC 445A.432. The ADR process facilities would utilize the design principle of 110 percent containment of the largest tank in the containment area (zero-discharge design) under both normal operating and specific emergency conditions. The Event Pond would have a leak detection and collection system.

Leach material at the heap leach pad would be placed by end-dumping from trucks. Figure 2.1.2 shows the proposed leach process flowsheet. The following section discusses the components of the HLF.

#### **2.1.3.1 Heap Leach Pad**

The total capacity of the life of mine heap leach pad is 16 Mt. The base of the pad would be graded in such a way to provide a stable surface on which to stack ore, and promote collection of process solution at the base. The base would be lined with a geosynthetic clay liner or low permeability soil layer overlain by a high density polyethylene (HDPE) geomembrane. The soil underliner would have a hydraulic conductivity of  $1 \times 10^{-6}$  centimeters per second (cm/sec) or less.



A drainage system would consist of highly permeable drainage aggregate inlayed with a network of drainage pipe to capture solution flows and direct them toward the process solution tanks and provide hydraulic relief to reduce the hydrostatic head on the liner. Ore would be stacked to a maximum height of 150 feet to provide sufficient vertical relief to overcome predicted deformation due to foundation settlement.

A minimum of 24 inches of select overliner material would be placed as an overliner drainage layer and liner cover layer to protect the synthetic liner and pipe network during subsequent stacking operations. Based on liner integrity testing, the material selected for use in the overliner layer would be crushed or screened to less than a 1.5-inch nominal diameter.

Geomembrane-lined internal cell separation berms would divide the pad into smaller and more manageable solution collection areas. Solution in each cell would be collected by a network of perforated corrugated polyethylene pipes which drain to the low point in each cell. The conveyance pipes would drain to the low point in the pad near the solution tanks and Event Pond area. After exiting the pad, the conveyance pipes would connect to flumes where solution from each cell can be monitored and measured.

The solution collection and conveyance pipes are conservatively designed to handle the design application rate of 0.0031 gallons per minute (gpm) per square foot at 50 percent capacity to account for storm events, scaling, and deformation. The solution collection channels along the perimeter of the leach pad containing the conveyance pipes would be formed by the offset from the heap toe to the perimeter containment berm and would be sufficient to accommodate the predicted runoff within the pad perimeter from the 100-year, 24-hour design storm event.

The HLF would be surrounded by containment berms to prevent run-on from entering the facilities. Culverts and diversion ditches would be placed in and around the facilities as necessary for further storm water control. Two vadose monitoring wells would be located down gradient of the toe of the heap leach pad and would be sampled on a regular basis, in accordance with the permit conditions required by the BMRR in the Water Pollution Control Permit (WPCP) when it is issued. These wells would be monitored to identify potential down-gradient effects from the heap.

Table 2.1-3 presents a summary of the heap design criteria.

**Table 2.1-3: Heap Leach Facility Design Parameters Summary**

Parameters	Value
Maximum heap height (feet)	150
Nominal lift height (feet)	30
Maximum overall heap slope	2.5H:1V
Target heap capacity (Mt)	16
Application rate (gpm/ft <sup>2</sup> )	0.0031
Nominal primary leach cycle solution application rate (gpm)	3,000

Parameters	Value
Nominal secondary leach cycle solution application rate (gpm)	1,500

### 2.1.3.2 Event Pond and Solution Tanks

A level platform would be constructed to accommodate the Event Pond, ADR Plant, and support facilities. The Event Pond would have slopes of 2.5H:1V, and a minimum depth of 29.7 feet. The pond volume would be approximately 7.58 million gallons (Mgal), with 6.5 feet of freeboard. The Event Pond depth would vary to accommodate a sloping bottom for leak detection.

During normal operations, flows would gravity drain from the heap leach pad and be directed to either the 90,000 gallon-capacity pregnant solution tank or 135,000 gallon-capacity barren tank. Both tanks would be cylindrical in shape, open at the top, and situated in a backfilled portion of the Event Pond.

The Event Pond and tank excavation area would be double-lined with HDPE geomembrane with an interlayer of geonet for leak detection. The pond and tank excavation bottoms would slope toward the east corners of the pond and excavated such that any leaks through the primary liner would gravity drain to Leak Collection Recovery System (LCRS) sumps.

Storm water runoff would be controlled around the HLF by berms and diversion ditches. Upgradient storm water diversion channels would be designed to protect the proposed facilities from runoff generated by the 100-year, 24-hour storm event.

### 2.1.3.3 Adsorption-Desorption-Recovery Processing Plant

An ADR plant would be installed at the proposed HLF. Preliminary engineering analysis has been performed to determine the ADR plant construction and operating parameters (Appendix H of the Mine Plan). The ADR process consists of the adsorption carbon columns, desorption facility which includes an acid wash and pressurized strip circuit, and recovery that includes electrowinning, mercury (Hg) retort, and induction smelting furnace. Detailed ADR plant facility design and specifications are detailed in the ADR design report (Appendix I of the Mine Plan). The plant would include one Carbon-in-Column (CIC) train that would consist of five columns each measuring 12.5 feet in diameter by 13 feet in height. These columns would operate with six tons of carbon per column. Pregnant solutions collected in the adjacent pregnant solution tank within the Event Pond would be pumped to the CIC train through pipes, and over containment or through double containment piping. Loaded carbon would be advanced to the desorption facility, including an acid wash vessel and an elution vessel for stripping. Processed carbon would be returned from the desorption facility to the CIC plant for regeneration and reuse. Effluent from the CIC would be returned to the barren tank for recirculation to the heap leach pad.

Pregnant eluant would flow to two electrowinning cells operated in parallel. Stripped gold would be plated from the pregnant eluant onto stainless steel cathodes, which would be periodically washed with a high pressure spray to remove the gold. The resulting sludge would be filtered in a filter press, and processed by retort to remove Hg.

Retorted sludge would then be processed in an induction smelting furnace. Off-gases from the furnace would be extracted with a blower and filtered in a baghouse dust collector to remove particulates and discharge to the atmosphere.

The CIC plant would be built on a concrete foundation that would incorporate 110 percent containment of the largest tank. Any spilled process solutions would flow by gravity to a sump where it would be pumped back into the process circuit. All appurtenances would be designed, installed, and commissioned for compliance with the International Cyanide Management Code, as well as with NAC 445A.

#### **2.1.4 Water Supply and Management**

Process make-up water would be provided from the Town of Tonopah. Water from the Town of Tonopah would be piped through a combination of underground and above-ground steel and HDPE piping to various Project components. A service road would be constructed parallel to the water supply pipeline.

The nominal capacity of the fresh water delivery system would be approximately 750 gpm (annual average), which would deliver the water through the distribution system to the processing facilities and other locations for wash and sanitary facilities. Tonopah Public Utilities (TPU) prepared a Water System Master Plan (TPU 2015) that identified that TPU has the capacity to serve the water supply needs of the Project.

Potable water for the Project would be supplied from the Town of Tonopah water system. Water quality is expected to meet drinking water standards.

#### **2.1.5 Chemical, Oils, and Fuels Storage and Use**

Table 2.1-4 lists the volume and shipment frequency of fuels and reagents that would be used at the Project. Acid solutions, caustic soda, and concentrated cyanide solutions would be delivered to the Project in liquid form. Containment of process solutions is based on 110 percent of the largest reagent container.

Acid would be stored in the ADR building and stored in individual totes or barrels. Total acid consumed would be approximately 1,300 gallons over the Project life.

Cyanide solution would be delivered to the Project in concentrated liquid form. Cyanide solution would be discharged from a liquid tank truck to a 10,000-gallon storage tank. The cyanide solution would then be metered to various points of use throughout the plant. The transfer of the cyanide solution from the delivery truck to the cyanide tank would be on a contained concrete slab that drains to a sump.

The caustic soda solution would be received in a 10,000-gallon tank, diluted, and then distributed to the plant. Liquid caustic soda solution would be delivered to the mine site at 50 percent concentration, and diluted to 20 percent concentration for use on site. The transfer of caustic soda solution from the delivery truck would occur on a contained concrete slab that drains to the caustic soda containment sump.

Liquefied natural gas (LNG) would be delivered in a 9,500-gallon pressurized tank that would store the LNG in a liquid state. The LNG would be transferred to a 13,520-gallon storage vessel that would deliver, through a vaporizer, natural gas in a gaseous state to the generator for on-site power. The generator would use approximately 13,255 standard cubic feet (scf) of natural gas per hour. Approximately 159 gallons of LNG would be required to deliver the 13,255 scf on natural gas to the generator. LNG consumption would be approximately 3,800 gallons per day (gpd).

Hydrocarbon products, including lubricants, oils, antifreeze, and used oil would be stored at the mine maintenance area (Figure 2.1.1). Reagents would be transported, stored, and used in accordance with federal, state, and local regulations. Diesel fuel and hydrocarbon products would be stored in primary (tanks, tote bins, barrels) and secondary containment to prevent release to the environment. Used oil and empty containers would be disposed of or recycled according to federal, state, and local regulations.

#### 2.1.5.1 Petroleum Contaminated Soil Management

WKM would transport petroleum contaminated soils to an appropriate off-site disposal facility.

#### 2.1.5.2 Waste Disposal Management

Used lubricants and solvents would be characterized according to the Resource Conservation and Recovery Act (RCRA) requirements and would be stored appropriately. WKM would obtain a Hazardous Waste Identification Number from the NDEP. The mine would be expected to be in the “conditionally exempt small quantity generator” category as defined by the US Environmental Protection Agency (EPA). Used solvents would be expected to be the only identified potential hazardous wastes at this time. WKM would institute waste management as part of the Emergency Response Plan (WKM 2014b) that identifies the wastes generated at the site and their means of disposal.

Used oil and coolant would be stored at the maintenance building and truck shop in secondary containment. These would be either recycled or disposed of in accordance with state and federal regulations. Used containers would be disposed of or recycled according to federal, state, and local regulations.

Solid wastes generated by the mine and process departments would be collected in dumpsters near the point of generation. Solid waste would be disposed of in an off-site Class III landfill in accordance with NAC 444.731 through 444.737. Employees would be trained in proper waste disposal procedures.

WKM would have a trained response team at the site 24 hours per day to manage potential spills of regulated materials at the site. While response to transportation-related releases of regulated materials bound for the site would be the responsibility of the local and regional agencies. However, where appropriate, WKM may assist with response to off-site incidents, including providing resources, based on agency requests.

**Table 2.1-4: Fuels and Reagents Volumes and Shipments**

Chemical	On-Site Storage	Anticipated Stored Amount	Estimated Consumption Rate	Shipment Frequency (per week)
<b>Heap Leach Process</b>				
Sodium Cyanide - Mixed to 30% NaCN	70,000 pounds	70,000 pounds	11,250 pounds/day	7
Lime - Dry pebble at 90% CaO	25-ton truckload	100-ton silo	30 tons/day	7
Anti-Scalant (liquid surfactant)	240 pound (lb) carboy	2 carboys	30 lb/day	1
<b>Carbon Acid Wash &amp; Neutralization</b>				
Hydrochloric Acid (HCL) - Liquid 30%	HDPE totes	3,000 gallons	10 lbs/day	*
Acid Wash Vessel	2,320 working gallons			
Acid Mix Tank	282 working gallons			
Caustic Soda - Sodium Hydroxide (NaOH) – Liquid	4,887 working gallons	5,000 gallons	65 gallons/day	*
<b>Fluxes</b>				
Borax (pentahydrats) – Dry	50 lb sacks	20 sacks	20 lb/day	*
Silica (SiO <sub>2</sub> ) – Dry	50 lb sacks	10 sacks	10 lb/day	
Niter (NaNO <sub>3</sub> ) – Dry	50 lb sacks	5 sacks		
Feldspar – Dry	50 lb sacks	5 sacks		
<b>Mercury Control</b>				
Sulfide-impregnated Carbon – Dry	50 lb sacks	40 sacks	25 lbs/day	*
<b>Mercury Recovered</b>				
Mercury	80 lb flasks		5 lbs/day	*
<b>Electrolytes</b>				
Sodium Hydroxide (NaOH) – Dry	20 lb sacks	10 sacks	15 lbs/day	*
<b>Assay and Met Lab</b>				
Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> ) Reagent Grade	1 gallon	6 gallons		*
Nitric Acid (HNO <sub>3</sub> ) Reagent Grade	1 gallon	10 gallons	1lb/day	
Hydrofluoric Acid (HF) Reagent Grade	1 gallon	2 gallons		
Hydrochloric Acid (HCL) Reagent Grade	1 gallon	4 gallons		
Sodium Cyanide (NaCN) Reagent Grade – Dry	5 lb box	10 boxes	1 lb/ day	
Buffer Solution Reagent Grade – Dry	5 lb box	10 boxes		
Lead Nitrate (PbNO <sub>3</sub> )- Dry	20 lb bag	1 bag		
Acetylene	Size 45 industrial Acetylene Cylinder	3 in lab/15 in shop	2 cylinders per week	
<b>Fluxes</b>				

Chemical	On-Site Storage	Anticipated Stored Amount	Estimated Consumption Rate	Shipment Frequency (per week)
Borax Penta - Use Plant Source			18 lbs/day	*
Silica - Use Plant Source				
Lead Oxide - Reagent Grade	80 lb pail	1 pail	2 lbs/day	*
Methyl Ethyl Ketone (MEK)	5 gallon pail	1 pail		
Silver Inquart	10 lb package	1 package		
	30,000 gallons	Up to 30,000 gallons	1,500 gal/day	3
	60 ton silo	Up to 60 tons	8 tons/day	1
	10,000 gallons	Up to 10,000 gallons	250 gal/day	1
	4,000 gallons	Up to 4,000 gallons	15-20 gal/day	1
	4,000 gallons	Up to 4,000 gallons	15-20 gal/day	
	2,000 gallons	Up to 2,000 gallons	1 G15 gal/day	
	2,000 gallons	Up to 2,000 gallons	10-15 gal/day	
	2,000 gallons	Up to 2,000 gallons	10-15 gal/day	
	2,000 gallons	Up to 2,000 gallons	10-15 gal/day	
	4 x 120 gallon totes, 4 x 30 gallon drums	Up to 4 totes, up to 4 drums	5-10 gal /day	
	13,520 gallons	9,500 gallons	3,800 gal/day	4

\* - Shipments for quantities of minor on-site chemicals will occur at a frequency of approximately once per month.

### 2.1.5.3 Explosive Storage Areas

Explosive agents would be purchased, transported, handled, stored, and used in accordance with the ATF, DHS provisions, and MSHA regulations. The primary explosive used would be ANFO. Ammonium nitrate prill would be stored in a silo in a secure area. ANFO would be mixed as required for blasting. Explosive agents, boosters, and blasting caps would be stored within a secured area. Boosters and detonators would be stored in separate storage magazines per regulations.

### 2.1.6 **Exploration**

Exploration activities would continue within the Project Area boundary in order to identify new mineral reserves or potentially expand existing mineral reserves. Exploration activities would consist of drill road and pad construction, surface sampling, trenching, bulk sampling, and drilling using both reverse circulation (RC) and core rigs. Drill holes would be closed in accordance with Nevada Revised Statutes (NRS) 534.

For the purposes of calculating surface disturbance, proposed exploration activities would occur outside of the proposed facilities' surface disturbance areas, but within the Project Area. Prior to the commencement of mining and as mining progresses, exploration would occur within the footprint of proposed facilities. WKM would provide the NDEP and BLM with actual disturbance updates annually that document surface disturbance locations, the amount and type of surface disturbance, and any completed concurrent reclamation delineated with a Global Positioning System (GPS) unit.

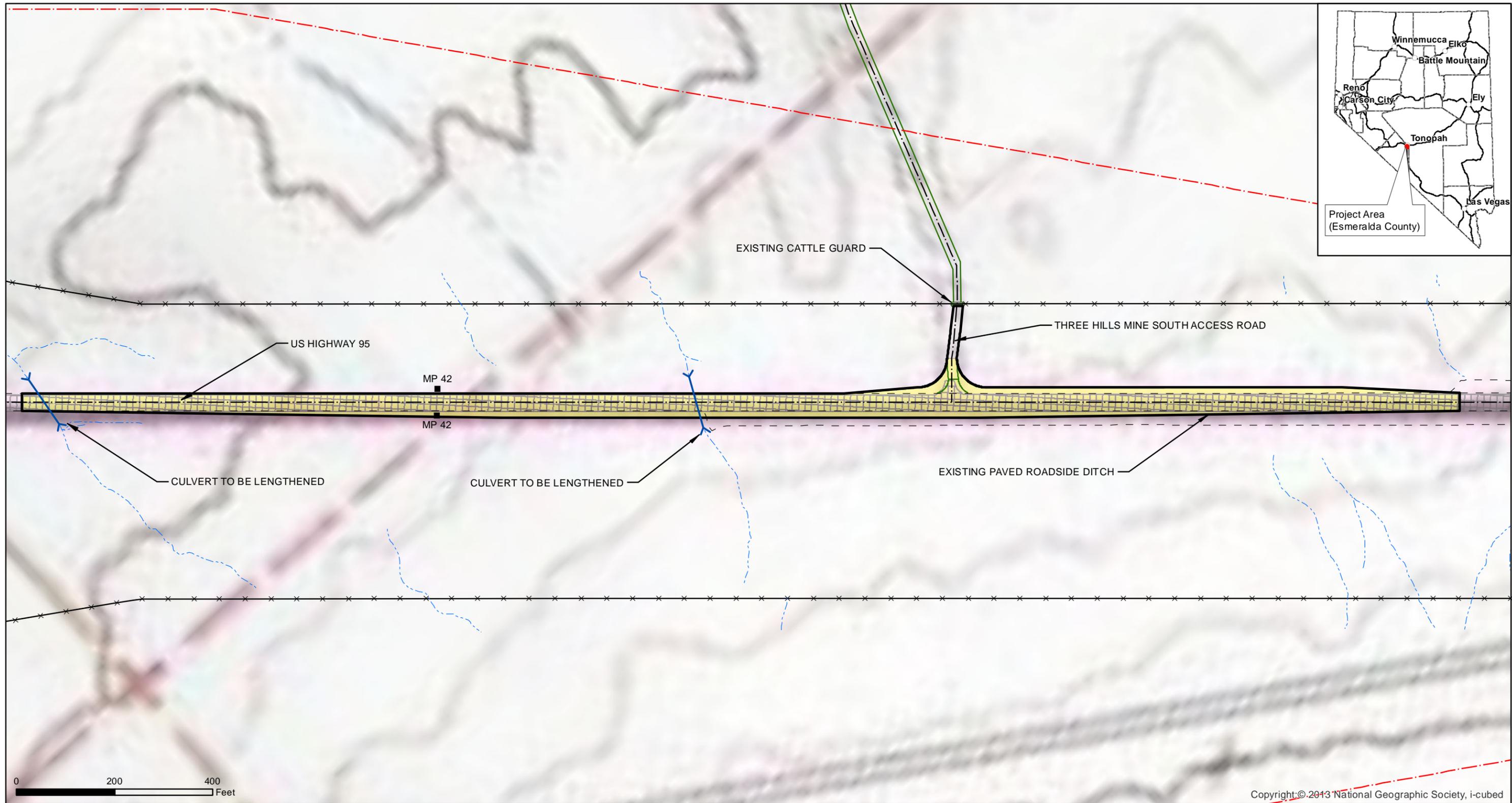
### 2.1.7 **Project Access**

#### 2.1.7.1 Access Road Use and Maintenance

The main access road to the Project would be via Knapp Avenue to Paymaster Canyon Road, which are Nye County and Esmeralda County roads, respectively, and maintained by the Counties (Figure 1.1.1). Knapp Avenue would generally be used by passenger vehicle access. A secondary access route (South Access Road), which has a Title V ROW with Esmeralda County, connects US Highway 95, south of the Town of Tonopah, with Paymaster Canyon Road, west of the Project Area (Figure 1.1.1). South Access Road would generally be used by semi-truck type equipment and supply deliveries.

#### 2.1.7.2 US Highway 95 Modifications

At the junction of US Highway 95 and the South Access Road, US Highway 95 would be modified to enhance safety. Turn and acceleration lanes would be constructed within the existing ROW for US Highway 95 at the junction with the South Access Road. US Highway 95 modifications would include the addition of a northbound left turn lane and a southbound right turn lane. The Three Hills mine south access road would be paved from the existing cattle guard to the intersection of US Highway 95 (Figure 2.1.3).



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**Explanation**

- Existing Drainage
- Existing Road Alignment
- · - · Right-of-Way Limits
- Existing Edge of Pavement
- x x x Existing Fence
- Existing 30" DIA. Concrete Pipe Culvert
- South Access Road
- Limits of Proposed Modifications to US HWY 95
- Existing Asphalt Pavement
- Mile Post Marker and Designation



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**BUREAU OF LAND MANAGEMENT**

**THREE HILLS MINE PROJECT**

**Three Hills Mine South Access Road and US Highway 95 Intersection**

Figure 2.1.3

10/07/2015

## **2.1.8 Mine Site Infrastructure**

### **2.1.8.1 Haul and Site Roads**

Haul roads would be constructed with maximum gradient of approximately ten percent with a 120-foot road width, which includes ditches and berms. The roads would be maintained according to MSHA standards, which include a berm at least half the wheel height of the largest vehicle utilizing the road. Runoff from haul and other Project roads would be collected and routed to sediment control basins as necessary.

The Project contains three proposed haul roads that are independent from other facilities (i.e., WRSAs). A fourth haul road is part of the West WRSA. The location of all haul roads is shown on Figure 2.1.1.

### **2.1.8.2 County Road Bypass**

Use of an Esmeralda County claimed road that runs east-west through the northern part of the Project Area would be closed for the duration of the Project by the perimeter fence and as a result would not be available for public use during the life of the Project. A bypass road would be constructed within the Project Area to the south and west of Project facilities, and would reconnect with the county road to the northwest of the Project Area to provide continued public access (Figure 1.1.1).

The bypass road would be reclaimed following successful completion of Project facility reclamation activities. The county claimed road would once again be accessible following the removal of the perimeter fence at mine closure.

### **2.1.8.3 Monitoring Well and Exploration Roads**

Access roads would be constructed to the three monitoring wells (Figure 2.1.1). Exploration disturbance (roads and pads) can occur anywhere within the Project Area in locations that have not yet been determined. The width of the roads would be 15 feet and are not expected to contain safety berms.

### **2.1.8.4 Power Supply**

Electrical power would be supplied to the mine via an on-site generation plant that uses LNG. The power demand would be approximately 1,500 kilowatts (kW) throughout the life of the mine.

One emergency diesel generator capable of producing 656 kW would be located at the process facility. This generator would provide sufficient emergency power to operate critical components at the leach facility in the event of a power outage.

#### 2.1.8.5 Ancillary Facilities

Proposed ancillary facilities would include Project access roads, laydown areas, maintenance facilities, a meteorological station, and other support facilities on flat terrain (Figure 2.1.1).

##### *Support Facilities*

Support facilities would consist of the mine maintenance area, warehouse, and administration buildings. In the maintenance area, the equipment maintenance would be performed on a concrete slab. The buildings would typically be insulated, pre-fabricated office trailers without concrete foundations. Heat would be provided by electric forced air furnaces in the office and personnel buildings and propane gas radiant heat in the maintenance bays. Gas would be provided from a propane tank located near the ADR plant building. Air conditioning would be provided by electrical cooling units.

Mobile equipment maintenance would be performed at the maintenance area. The maintenance area would consist of an enclosure and concrete pad of appropriate size, a wash bay, and an oil/water separator.

A fuel storage depot would be located at the contractor yard. The depot would include separate diesel above-ground tanks for fueling of light/intermediate and heavy vehicles. Gasoline would be obtained from public filling stations in the Town of Tonopah when practicable, or from a tank in the fuel storage depot at the contractor yard. Spill containment would be designed for 110 percent of the largest tank or tanker within the containment. Fuel would be delivered by highway-legal trucks directly to the depot. Drivers off-loading fuel would be certified and trained. Camlock fittings or other appropriate fittings would be located within the containment to collect spilled fuels. A sump would be located at one end of the containment so that spilled fuels can be pumped for appropriate disposal from the containment using a portable pump.

Lubricants, antifreeze, and used oil and coolant would be managed and stored in the area in a manner complying with MSHA requirements and other state and federal regulations.

A centralized oil-water separator would be installed adjacent to the truck shop to treat water from drains located at each maintenance bay and from the wash rack. The floor drains in the maintenance area would be intended for collection of rainwater and snow melt from vehicles and equipment. Gray water from the oil/water separator would be collected in a tank within containment or a lined impoundment. Gray water would be recycled back to the wash system; excess water would be used for dust control. Separated oil would be stored either in a double-lined tank or a single-wall tank in a concrete containment and collected by a licensed waste collection contractor.

Administration and security offices would be located northwest of the process building as shown on Figure 2.1.1. These offices would house the reception area, offices for administrative staff, a first aid room, and a meeting/training room.

A septic system with the capacity to treat waste for up to 100 individuals would be installed to the west of the administration and warehouse buildings (Figure 2.1.1).

*Growth Media Salvage and Stockpiles*

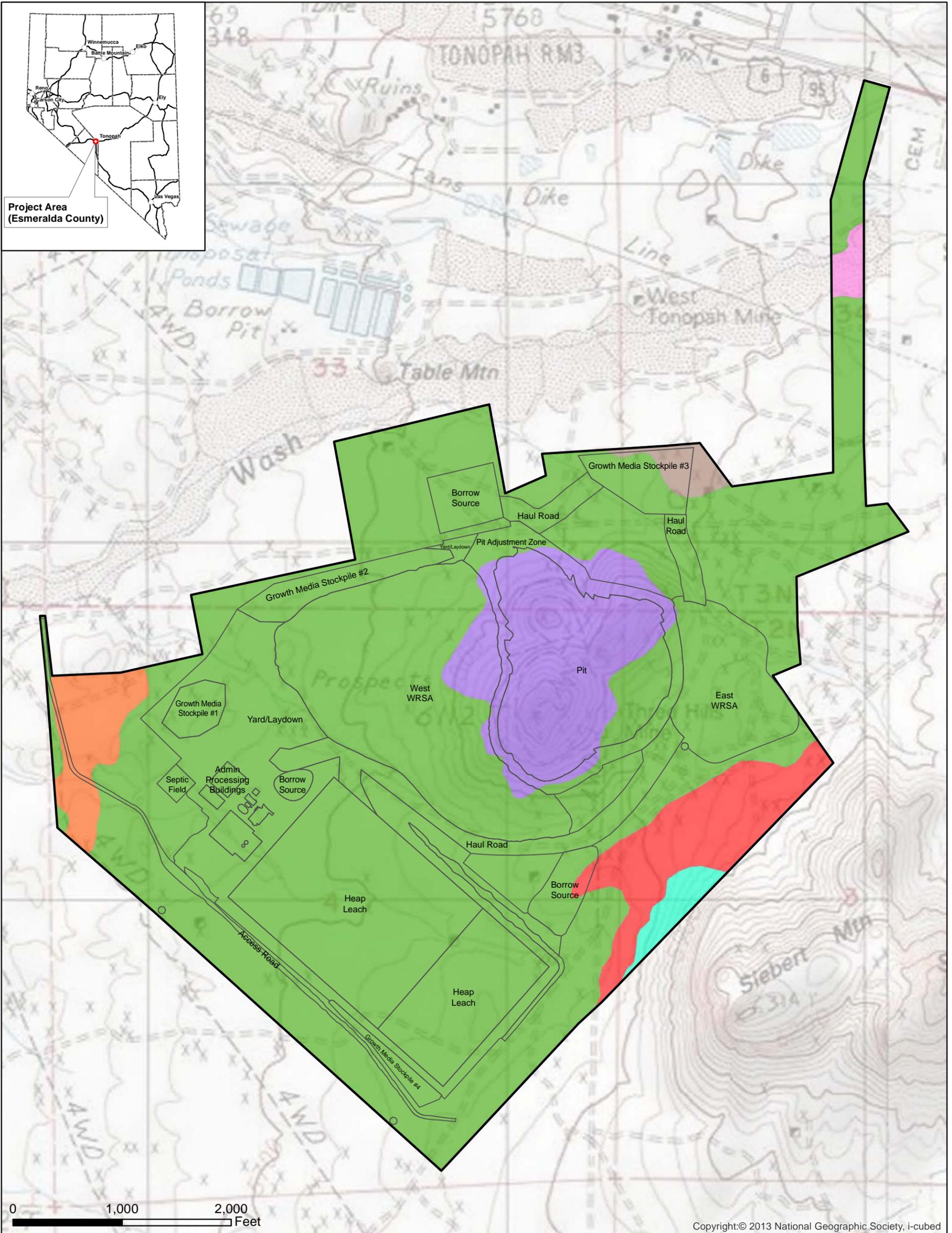
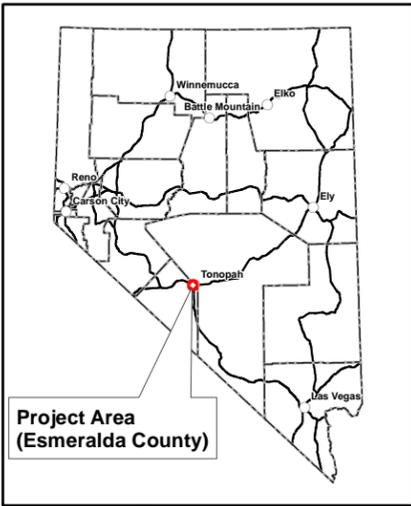
Salvageable growth media from the Project surface disturbance would be stockpiled at centralized locations, as shown on Figure 2.1.1. Growth media would be salvaged for reclamation. Section 2.1.10.1 presents a further discussion on growth media salvage. Growth media would consist of soils and alluvium stripped prior to surface disturbing activities. Any growth media remaining in the stockpiles for one or more planting seasons would be seeded with an interim seed mix to stabilize the material to reduce erosion and minimize the establishment of undesirable weeds.

Based on the data in Table 2.1-5 and Figure 2.1.4, approximately 557,809 bank cubic yards (bcy) of growth media would be salvaged from the two WRSAs, the HLF, and other Project-related facilities. Facilities without growth media salvage are the open pit, water pipeline, fence, borrow areas, growth media stockpiles, and exploration areas. These bcy convert to approximately 697,261 loose cubic yards (yd<sup>3</sup>) based on a 25 percent swell factor. Areas affected by past mining operations or other past disturbance do not have growth media and no salvaging would occur in these areas. This volume could change based on actual field conditions encountered. On sloped terrain, some soil may be salvaged by pushing available natural growth media cover downhill with a dozer to construct toe berms to prevent rocks from scattering on the hillside below the stockpile toes.

**Table 2.1-5: Growth Media Balance for Stockpiling**

Facility	Area (acres)	Growth Media Recovery Depth (feet) <sup>1</sup>	Volume (bank cubic yards)	Stockpile Source (see Figure 2.1.5)
Open Pit, including adjustment zone	74.3	0.5	59,935	#3
Waste Rock Storage Areas	112.9	1	182,145	#2 and #3
Heap Leach Facility	88.8	1	143,264	#1, #2, and #4
Buildings/Ponds/Septic	6.6	1	10,648	#1
Laydown Area/Yards	63.6	1	102,608	#1
Haul Roads	27.4	1	44,205	#3
Access Roads	6.1	1	9,841	#3
Water Pipeline	5.6	0	0	N/A
Fence	14.7	0	0	N/A
Borrow Areas	15.7	0	0	N/A
Diversion Ditches	3.2	1	5,163	#4
Growth Media Stockpiles	28.4	0	0	N/A
Exploration	10.0	0	0	N/A
<b>Total</b>	<b>457.3</b>	<b>-</b>	<b>557,809</b>	

<sup>1</sup> The growth media depth on the open pit is 0.5 feet to account for the rocky nature of the soils in the open pit area. The growth media depth on the fence, exploration activities, water pipeline, borrow areas, and growth media stockpiles are set at zero since the construction of these facilities would incorporate the soils into the construction and reclamation and there would be no stockpiled growth media.



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**Explanation**

- Project Area
- Mine Facilities
- 101, Unsel-Wardenot-Izo association
- 191, Terlco-Advokay-Downeyville association
- 221, Advokay-Blacktop-Itme association
- 230, Stewval-Downeyville-Rock outcrop association
- 270, Lathrop-Leo association
- 360, Downeyville-Pintwater-Rock outcrop association
- 902, Slickens



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**BUREAU OF LAND MANAGEMENT**

**THREE HILLS MINE PROJECT**

**Growth Media Salvage Map**

Figure 2.1.4

10/07/2015

### *Sediment Control Structures*

Sediment control structures such as sediment basins and surface water diversion channels and ditches would be constructed during operations around surface facilities. A SWMP (Appendix O of the Mine Plan) was developed to address non-contact water runoff emanating primarily from undisturbed contributory catchment areas and runoff from areas where the ground surface has been disturbed (i.e., roads and plant site/mine complex platforms). These structures would be maintained throughout the life of the Project. Soil collected in these structures would be periodically removed and placed in soil stockpiles or used for reclamation. Features that would not remain after closure would be removed once vegetation is established and sediment runoff has stabilized.

The Project would also implement temporary BMPs during ongoing facility construction for runoff control that include silt traps and fences constructed of certified weed-free straw bales, or geotextile fabric, and sediment basins.

The long-term controls would be managed throughout the life of the operations are described below.

#### Heap Leach Facility Diversion Channel

This channel is located on the northeast and southeast sides of the HLF (Figure 2.1.1). This channel would divert runoff originating from upstream catchment areas. The diversion channel has been designed to convey flow from the 100-year, 24-hour storm event, discharging flow onto the natural topography that drains to Slime Wash. The calculated storm water flow velocities are estimated to be below five feet per second and riprap or channel erosion protection would not be required. The diversion channel would be maintained during the mine life and remain in place following closure activities.

#### Lime Silo Access Road Ditch

The channel would be constructed on the northeast side of the Lime Silo Access Road. The diversion channel has been designed to convey flow from the 100-year, 24-hour storm event. The ditch would be maintained throughout the mine life and reclaimed as part of the road and surrounding disturbance.

#### Roadside Ditches

Roadside ditches would be constructed as necessary to control storm water runoff and maintain safe roadway conditions. The ditches would be v-ditches with a minimum depth of one foot and 3H:1V side slopes. The ditches would be maintained throughout the mine life and removed as part of road reclamation activities.

#### Sediment Collection Basins

Three sediment collection basins have been located in areas where sediment generation is estimated to be greatest. The basins would be maintained throughout the mine life and reclaimed as part of the facility on which they are located.

### Infiltration Basins

Infiltration basins would be placed in the shoulders of the haul road and around the perimeter of the WRSAs. The basins would accept runoff from the WRSAs, collect sediments, and allow the storm water to evaporate and infiltrate. The basins would measure approximately four feet wide by ten feet long by four feet deep. The basins would be maintained throughout the mine life and reclaimed as part of the WRSAs.

### Culverts

Culverts have been designed for strategic placement at diversion or drainage road crossings and sized to effectively convey storm flows. These culverts would be maintained throughout the mine life and removed as part of final reclamation.

### *Borrow Areas*

Borrow areas are located north and south of the open pit and adjacent to the processing facility. Borrow material would be required for areas that need prepared subgrade materials, drainage materials, pipe bedding materials, road surfacing materials, retarding layer materials, and riprap. The depth of the potential borrow area is expected to be between five and 25 feet.

### *Fencing*

A perimeter fence, approximately 22,296 feet in length, would be constructed around the Project facilities to preclude access by livestock, wildlife, and the public (Figure 2.1.1). In general, four-strand barbed wire fences would be constructed in accordance with BLM fencing standards per BLM Handbook 1741-1. The area within the perimeter fence is approximately 480 acres. Gates or cattle guards may be installed along roadways within the Project Area, as appropriate. The perimeter fence would be monitored on a regular basis and repairs made as needed.

## **2.1.9 Safety and Fire Protection**

The Project would operate in conformance with all MSHA safety regulations (30 CFR 1-199). Site access would be restricted to employees and authorized visitors. Fire protection equipment and a fire protection plan would be established for the Project Area in accordance with State Fire Marshal standards.

## **2.1.10 Reclamation**

Reclamation of disturbed areas resulting from activities outlined in this Reclamation Plan would be completed in accordance with BLM and NDEP regulations. The purpose of Subpart 43 CFR 3809 - Surface Management is to prevent unnecessary or undue degradation of public lands by operations authorized by the mining laws. Anyone intending to develop mineral resources on public lands must prevent unnecessary or undue degradation of the land and reclaim disturbed areas. This subpart establishes procedures and standards to ensure operators and mining claimants meet this responsibility and provide for the maximum possible coordination with appropriate state agencies to avoid duplication and to ensure operators prevent unnecessary or undue degradation of public lands by operations authorized by the mining laws. The State of

Nevada requires development of a reclamation plan for any new mining project and for expansions of existing operations (NAC 519A).

The Project disturbance areas are summarized in Table 2.1-1. The areas proposed for disturbance can be divided into the following: open pit; WRSAs; heap leach facility; borrow areas; growth media stockpiles; haul roads; buildings and yard areas around mine; process plant; administration; laboratory; and ancillary facilities. WKM anticipates with the exception of the open pit high walls, surface mine components would be reclaimed and revegetated.

The slope angles of the open pit would not allow growth media placement and revegetation due to access logistics, steepness and safety concerns. An exemption for the open pit would be sought under NAC 519A.250. The pit floor would be reseeded.

#### 2.1.10.1 Growth Media

Soil would be salvaged from new areas of disturbance prior to construction by dozing material depths directly into stockpiles adjacent to disturbances. Soil depths and volumes (in bcy) are shown in Table 2.1-5. The growth media requirements are shown in Table 2.1-6. The stockpile quantities are shown in Table 2.1-7. These stockpiles would be clearly identified as to their content using signs and other barriers to prevent access by motorized equipment. Growth media stockpiles would be graded to be stable and seeded with the reclamation seed mix in Table 2.1-8.

**Table 2.1-6: Growth Media Requirements**

Facility	Reclaimed Area (acres)	Growth Media Application Depth (feet) <sup>1</sup>	Volume Applied (cubic yards)
Open Pit, including adjustment zone	74.3	0	0
Waste Rock Storage Areas	116.5	1	187,953
Heap Leach Facility	92.1	2	297,176
Buildings/Pond/Septic	6.6	1	10,648
Laydown Area/Yards	64.3	1	103,737
Haul Roads	28.1	1	45,335
Access Roads	6.1	1	9,841
Water Pipeline	5.6	0	0
Fence	14.7	0	0
Borrow Areas	15.7	0	0
Diversion Ditches	3.2	0	0
Growth Media Stockpiles	28.4	0	0
Exploration	10.0	0	0
<b>Total</b>		-	<b>654,690</b>

<sup>1</sup> The growth media application depth on the open pit and diversion ditches is zero since no growth media would be applied to the open pit. The growth media depth on the fence, exploration activities, water pipeline, borrow areas, and growth media stockpiles are set at zero since the construction of these facilities would incorporate the soils into the construction and reclamation and there would be no application of growth media during reclamation.

#### 2.1.10.2 Growth Media Placement

During final reclamation, salvaged growth media would be placed over the surface of the facilities. Growth media required for reclamation of each facility is shown in Table 2.1-6 and the

total growth media stockpile volume is shown in Table 2.1-7. Should additional soil be required, borrow areas have been identified.

**Table 2.1-7: Growth Media Stockpiles**

Stockpile	Volume (loose cubic yards) <sup>1</sup>
#1	201,263
#2	173,534
#3	256,316
#4	66,148
<b>Total Volume</b>	<b>697,261</b>

<sup>1</sup>The volume has been converted from bcy in Table 2.1-5 to loose cubic yards with a 25 percent swell factor.

Before placement of the growth media, the subsoil surface would be roughened by ripping to ensure a good contact. The growth media would be dumped and spread using a minimum number of passes to limit compaction. Controlled dozer tracking may be performed during placement of the growth media to roughen the surface, lightly compact the soil, and prevent erosion.

#### 2.1.10.3 Seedbed Preparation

Seedbed preparation and reseeding efforts for areas to be revegetated would take place after placement of the growth media. Compacted surfaces would be loosened during seeding and left in a rough condition.

Soils and substrate materials would be tested for fertilizer and other amendment requirements. At this time, WKM assumes that no soil amendments would be necessary due to the adequate availability of collected near-surface growth media. Where amendments may be needed, they would be incorporated into the top four to six inches of the surface by mechanical or other means. This may be accomplished during ripping or dozer tracking.

#### 2.1.10.4 Revegetation, Seeding, and Planting

All reclaimed surfaces would be revegetated to control runoff, reduce erosion, provide forage for wildlife and livestock, and reduce visual impacts. Areas that are accessible to equipment would be scarified with a chisel tooth harrow and seeded through broadcasting either by hand or with equipment such as a Challenger tractor.

The harrow/mechanical broadcaster would provide seedbed preparation and planting in one operation. Slopes that exceed 2.5H:1V, or other areas inaccessible to equipment, would be seeded by hand broadcasting. Seedbed preparation and seeding would take place when possible in the fall after regrading on reclaimed areas.

Seeding completed with the Challenger tractor would be done with a large cyclone broadcast seeder. The seed would then be covered using a wire harrow pulled by the Challenger tractor. Seeding depths would range from ¼ to ¾ inch. Most grasses and forbs would not exceed ½-inch depth. Areas requiring additional seedbed preparation would be scarified with the wire harrow prior to seeding. In steep or excessively rocky areas where uniform coverage would be difficult,

hand broadcasting with a cyclone-type bucket spreader or a mechanical seed blower would be used in conjunction with the Challenger tractor. Hand broadcast seed would be covered by harrowing, raking, or other appropriate site-specific methods.

Reclamation seed mixes and application rates which would be based on the BLM requirements (Table 2.1-8) would be used. This mixture would provide forage and cover species similar to the pre-disturbance conditions, facilitating the post-mining land uses of livestock grazing and wildlife habitat. In addition, the seed mix has been determined according to the species' effectiveness in providing erosion protection, the ability to grow within the constraints of the low annual precipitation experienced in the region, suitability for site aspect, and the elevation and soil type.

**Table 2.1-8: Anticipated Seed Mix for the Project**

Common Name	Scientific Name	Pounds Pure Live Seed per Acre
<b>Shrubs</b>		
Fourwing saltbush	<i>Atriplex canescens</i>	4.00
Shadscale saltbush	<i>Atriplex confertifolia</i>	4.00
Winterfat	<i>Krascheninnikovia lanata</i>	4.00
Spiny hopsage	<i>Grayia spinosa</i>	2.00
<b>Forbs</b>		
Scarlet globemallow	<i>Sphaeralcea coccinea</i>	0.50
Lewis flax	<i>Linum lewisii</i>	0.75
<b>Grasses</b>		
Crested wheatgrass	<i>Agropyron cristatum</i>	1.00
Indian ricegrass	<i>Achnatherum hymenoides</i>	1.00
Great Basin wildrye	<i>Leymus cinereus</i>	1.00
Squirreltail	<i>Elymus elymoides</i>	1.00

Note: Early contemporaneous revegetation would be monitored, and final seed mixes would be evaluated and modified depending on monitoring results.

The proposed seed mix and application rates are subject to modification by the BLM. The actual seed mix and application rates would be determined prior to reseeding based on the results of reclamation in other areas of the mine, concurrent reclamation, or changes by the BLM in its seed mix requirements.

#### 2.1.10.5 Proposed Reclamation Schedule

The proposed Project would be active for approximately eight years, which includes one year of construction, two years of mining, two years of post-mining heap leaching, and three years of closure and reclamation. Several years beyond that date could be anticipated for ground water monitoring. This schedule may be modified based on the rate of mining and future commodities prices. The projected reclamation schedule for the Project is shown on Figure 2.1.5.

MINE COMPONENT	Mining and Processing Operations (Years)					Reclamation and Closure (Years)				
	1	2	3	4	5	6	7	8	9	10
<b>Open Pit</b> Pit Safety Berm Construction Pit Safety Berm Revegetation				■						
<b>Waste Rock Disposal Facilities</b> Regrading Growth Media Application Revegetation				■	■	■				
<b>Heap Leach Pad</b> Earthworks and Conceptual Cover Placement Revegetation						■	■	■		
<b>CIC Plant</b> Buildings/Structure Demolition & Removal							■	■		
<b>Haul &amp; Access Roads</b> Haul Roads Earthwork/Revegetation Access Roads Earthwork/Revegetation				■	■					
<b>Ancillary Facilities</b> Growth Media Stockpiles Borrow Pit Sediment Control Structures Utility Corridors						■	■	■		
<b>Exploration</b> Regrading/Revegetation										
<b>Reclamation Monitoring<sup>1</sup></b>						■	■	■	■	■
<b>PROCESS COMPONENT</b>						<b>Process Fluid Management and Drain Down (Years)</b>				
						6	7	8	9	10
<b>Process Fluid Management</b> <b>Heap Leach Facility</b> IFM and Phase I Fluid Management Phase II Fluid Management Phase III Fluid Management Phase IV Fluid Management Process Pond ET Cell Conversion/Construction						■	■	■		

<sup>1</sup> Reclamation monitoring includes three years of monitoring of the revegetation for success.



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**BUREAU OF LAND MANAGEMENT**

**THREE HILLS MINE PROJECT**

**Proposed Project  
Reclamation Schedule**

Figure 2.1.5

10/07/2015

Concurrent reclamation would be ongoing over the life of the Project in areas that have reached their final configurations. Reclamation of the WRSAs would be started in Year 2 when final buildout is expected to be completed on a portion of the storage areas. At final buildout, the WRSAs would be recontoured to an overall slope of 3H:1V. Upon completion of mining, the WRSA recontouring, growth media placement, and seeding would be completed pursuant to the Final Plan for Permanent Closure and reclamation schedule submitted for the Project.

Closure of the heap leach pad would commence in Year 5. Reclamation of this facility is expected to be concurrent with drain down operations. Closure and reclamation of the process facilities and ancillary facilities would begin after the completion of mining and leaching.

#### 2.1.10.6 Reclamation of Waste Rock Storage Areas

##### *Regrading*

Waste rock would be placed in 50-foot lifts by end dumping from haul trucks at the angle of repose (approximately 1.5H:1V, or 34 degrees). Catch benches would be approximately 76 feet wide to achieve overall operating slopes of 3H:1V. The ultimate geometry was modeled to a maximum design height of 240 feet. The facilities would be regraded to an average final slope configuration not steeper than 3H:1V to provide for long-term stability.

During reclamation, the outer slopes would be irregularly contoured to achieve natural-looking overall slopes with a rounded crest to produce a more natural appearance. The top of the facility would be scarified to break up compaction and would be regraded to produce a positive slope toward the outer edges of one percent to promote run off.

##### *Growth Media Placement*

The primary purpose of the cover on the WRSA's would be to support vegetation and limit erosion. The proposed cover thickness is one foot. Growth media would come from adjacent stockpiles.

##### *Soil Stabilization*

Successful revegetation approaching surrounding native vegetation densities would reduce surface erosion significantly.

Soil erosion from the WRSAs would be minimized using the following methods:

- Regrading the WRSAs to an average final slope of 3H:1V;
- Leaving small horizontal benches along the contour at least every 50 vertical feet of slope;
- Rounding the crest and toes to gradually match the top and bottom slopes;
- Contour scarifying the slopes;
- Applying growth media; and
- Revegetating the surfaces.

### 2.1.10.7 Reclamation of Heap Leach Facility

Reclamation methods for the HLF would recognize ore and solution characteristics, site conditions, and climatic conditions. Pursuant to the requirements of the NDEP (NAC 445A.446 and NAC 445A.447), a summary of the principal heap leach closure steps follows.

#### *Regrading*

The HLF would be constructed with an operational slope of 3H:1V and bench heights of 35 feet. The sideslopes would be regraded to minimize the total continuous slope length with benches and rounding the toe and crests to help limit erosion until vegetation is established. The toe of the regraded slope would end inside and at the edge of the lined facility in such a way that the subsequently placed cover material would allow the surface runoff to be directed off the lined area of the pad.

Regrading of the HLF to a final slope configuration not steeper than 3H:1V would cover the heap leach solution collection ditches. The drain pipe in the solution collection ditches is designed with gravel backfill.

#### *Growth Media Placement*

The primary purpose of the cover on the HLF would be to support vegetation and limit erosion. The proposed cover thickness is two feet. Growth media would come from adjacent stockpiles.

#### *Soil Stabilization*

Successful revegetation approaching surrounding native vegetation densities would reduce surface erosion significantly.

Soil erosion from the HLF would be minimized using the following methods:

- Regrading to an average final slope of 3H:1V;
- Leaving small horizontal benches along the contour at least every 30 vertical feet of slope;
- Rounding the crest and toes to gradually match the top and bottom slopes;
- Contour scarifying the slopes;
- Applying growth media; and
- Revegetating the surfaces.

#### *Storm Water Diversion*

Storm water flow would be directed around the HLF by a diversion ditch designed for a 100-year, 24-hour storm event as required by NAC 445A.433(1)(c). This ditch would remain in place following reclamation and closure of the HLF to ensure long-term stability.

Upgradient storm water would be intercepted and routed around the HLF via the diversion channel and culverts to a natural drainage way. The diversion channel is designed as a trapezoidal section with a constant eight-foot bottom width and a minimum depth of four feet.

The calculated storm water flow velocities are estimated to be below five feet per second and riprap or channel erosion protection would not be required.

### *Cyanide Stabilization and Neutralization*

Rinsing of the HLF with fresh water would provide no added benefit other than the reduction of cyanide which can be achieved by recirculation of remaining heap solution during residual gold recovery and fluid management during closure. Rinsing would also result in the consumption of a large quantity of freshwater that would then need to be managed by evaporation. Consequently, fresh water rinsing of the heap material is not proposed.

### *Treatment of Outflows, Residual Chemical or Fluids in the Heaps*

After operations cease, solution in the heap leach pad would be allowed to drain down until the rate of flow can be passively managed by a regime of active and passive evaporation within downstream process tanks, the Event Pond, and recirculation back to the heap. As the solution is removed from inventory, portions of the heap leach pad would be reclaimed and covered with a growth media cover. Once draindown flows are low enough to be managed through evaporation at the Event Pond, the remainder of the heap would be reclaimed as described above.

Four phases of solution management or process fluid stabilization (PFS) would be required throughout the closure process, with blending of strategies from one phase to another:

- Phase I - active evaporation at the downstream process tanks, the Event Pond, and recirculation and evaporation at the heap surfaces;
- Phase II - active and passive evaporation at the process tanks and Event Pond only. Latter stages of Phase II are characterized by intermittent active evaporation within the pond footprint. Pond inventories are eliminated at maximum in-pond active evaporation rates, and then evaporation is halted and inventories allowed to accumulate to maximum operating volumes prior to the next active evaporation event;
- Phase III - passive evaporation at the Event Pond only and construction of an infiltration system or conversion of the pond to an ET cell; and
- Phase IV – long-term (indefinite) passive evaporation using an ET cell.

This approach acknowledges the initially high drainage rates and the need to prevent release from the system, while effectively eliminating inventory at maximum drainage rates from the heap. Also, since recirculation and evaporation at the heap surface would result in additional infiltration into the heap, the heap surface evaporation system would be eliminated first in preference for downstream active evaporation within the lined Event Pond. Finally, active management would be phased out by growth media application and revegetation and eliminating residual drain down to a level that can be handled by passive systems. The passive systems may then be partially reduced in size over time as flows reach steady state.

Long-term effluent discharge would be managed pursuant to the requirements of the NDEP (NAC 445A.446 and 445A.447). This would include the construction of an ET cell using the Event Pond. The details of final closure would be disclosed in the final closure plan submitted two years prior the end of the life of mine (LOM).

#### 2.1.10.8 Reclamation of Solution Ponds

When no longer needed for solution management, the Event Pond would be converted into ET cell.

#### 2.1.10.9 Reclamation Techniques of Road Features

Access, exploration, small vehicle mine roads, and haul roads would be reclaimed concurrently as they are no longer needed for reclamation and closure activities. The primary reclamation objectives for the roads would be long-term stabilization.

##### *Recontouring or Regrading*

All roads scheduled for reclamation would be recontoured to the approximate original topography or in a manner consistent with the final surrounding topography. This would be accomplished by pulling in road safety berms, ripping the road surface, removing any culverts and reestablishing drainage. Where roads were constructed by cutting, the edge berm and fill would be pulled back against the inside cut of the road. Dikes and ditches that would no longer be required would be regraded.

Since roads are constructed with near surface soils which would be replaced on the road surface during reclamation activities, no growth media would be needed prior to seeding with the reclamation mix.

#### 2.1.10.10 Measures to Minimize Sediment Loading to Surface Waters

There are no lakes or perennial streams in the immediate vicinity of the Project. During operations sediment-laden runoff would be managed through roadside channels, sediment collection basins, and other appropriate BMPs. Surface water runoff from catchment areas upstream of the HLF would be intercepted and routed around the facility via a diversion channel and culverts to a natural drainage way.

Runoff from the WRSAs and other slopes would occur following precipitation events; however, regraded slope angles, revegetation (including growth media placement) and BMPs would be used to limit erosion and reduce sediment in runoff. Silt fences, sediment traps, or other BMPs would be used to prevent migration of eroded material until reclaimed slopes and exposed surfaces have demonstrated erosional stability.

As discussed in Section 2.1.10.7, the heap leach diversion channel would be constructed during operations and remain in place following closure. The drainage and sediment control plan is designed to require no maintenance. Natural drainages would be reestablished, and existing natural channels would be used.

#### 2.1.10.11 Disposition of Buildings and Ancillary Facilities

All buildings and facilities associated with the Project would be removed from the site during the salvage and site demolition phase. Most of the building materials would be salvageable and would be removed from the site. Those materials which are unsalvageable and meet the solid

waste disposal criteria would be disposed of in a permitted landfill facility. Concrete foundations and stem walls would be demolished to natural grade, broken up to allow drainage through slab foundations, and buried in place under approximately three feet of material in such a manner to prevent ponding and to allow vegetation growth. The sites would then be covered with approximately 12 inches of growth media and revegetated. Alternatively, buildings and structures may be left on private land in support of other industrial or commercial post-mining land uses.

All reagents, chemicals, and other hazardous or toxic materials would be removed from the site. Any above surface pipelines would be removed and salvaged or disposed. Underground pipeline ends would be capped and left in place. Utility poles would be cut off at ground level and perimeter fencing would be removed.

#### 2.1.10.12 Reclamation of Open Pits

Mining the open pit would result in an excavation depth of between approximately 52 and 524 feet below ground surface and approximately 484 feet above the existing water table. Wall slopes would range from approximately 35 degrees to 45 degrees, depending on rock type and geotechnical considerations. Ongoing geotechnical and slope movement monitoring studies would be used to evaluate the safety of the open pit wall slopes.

In order to comply with NAC 519A.315(3)(e) and BLM requirements to ensure public safety, a safety berm would be installed along the open pit crest areas to control access by people, livestock, and large wildlife. Post-mining open pit wall modifications to decrease slope angles are not proposed.

#### 2.1.10.13 Drill Hole Plugging and Water Well Abandonment

All mineral exploration and development drill holes, and monitoring and observation wells subject to Nevada Division of Water Resources (NDWR) regulations would be abandoned in accordance with applicable rules and regulations (NAC 534.425 through 534.428). Boreholes would be sealed to prevent cross contamination between aquifers and the required shallow seal would be placed to prevent contamination by surface access. A maximum of two core and two RC drill holes may be open at any one time for exploration during operations.

Monitoring wells around the HLF would be maintained by WKM until released of this requirement by the NDEP. These wells would then be plugged and abandoned according to the requirements of the State Engineer.

#### 2.1.10.14 Concurrent Reclamation

Some facilities or portions of the Project facilities would be decommissioned prior to final mine closure. These areas would be reclaimed concurrently with the active mining operations. Concurrent reclamation would take place on inactive portions of facilities as soon as practical and safe. Growth media stockpiles would receive interim seeding following construction, and the area would be reclaimed after the soil is used in reclamation.

### 2.1.10.15 Long-Term Funding Mechanism

Pursuant to the Guidelines for Establishing a Long Term Funding Mechanism (LTFM) and in accordance with 43 CFR 3809.552(c), the BLM has determined that a LTFM may be required for post-reclamation obligations (including long-term monitoring and mitigation) associated with the closure process of the Three Hills Mine. Long-term (indefinite) passive evaporation using ET cells would be incorporated into a LTFM.

### 2.1.11 Applicant-Committed Environmental Protection Measures

The following Applicant-Committed Environmental Protection Measures (ACEPMs) are proposed to prevent unnecessary or undue degradation during construction, operation, and reclamation of the Project. The measures are consistent with the general requirements established in the BLM's Surface Management Regulations at 43 CFR 3809 and the BMRR mining reclamation regulations, as well as water, air quality, and other environmental protection regulations and guidelines.

#### *Air Quality*

- Air emissions, including point and fugitive sources, would be controlled in accordance with the air quality operating permits obtained for the Project and would be controlled in accordance with BMPs. For example, dust control would be provided for haul roads through water application. Point sources would maintain their appropriate controls as identified in the air quality permits.
- WKM commits to the following practices for the control of fugitive dust from mining activities and exhaust emissions:
  - Use dust abatement techniques on unpaved, unvegetated surfaces;
  - Conduct regular maintenance on equipment to ensure proper function;
  - Post and enforce speed limits;
  - Comply with NDEP BAPC Air Quality Operating Permits; and
  - Use dust abatement techniques before and during surface clearing activities by enforcing a Dust Control Plan.

#### *Cultural and Paleontological Resources*

- Pursuant to 43 CFR 10.4(g), WKM would notify the BLM-authorized officer, by telephone, and with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined in 43 CFR 10.2). Further pursuant to 43 CFR 10.4, WKM would immediately stop all activities in the vicinity of the discovery and not commence again until a notice to proceed is issued by the BLM-authorized officer.
- WKM would inform all field personnel of the Archaeological Resources Protection Act of 1979 (ARPA) and the Native American Graves Protection and Repatriation Act of 1990 (Public Law [P.L.] 101-601) (NAGPRA) responsibilities and their associated

penalties. WKM would establish policies to protect cultural resources and minimize the potential for inadvertent impacts to sites.

- WKM would not knowingly disturb, alter, injure, or destroy any scientifically important paleontological deposits. In the event that previously undiscovered paleontological resources are discovered by WKM in the performance of any surface disturbing activities, the item(s) or condition(s) would be left intact and immediately brought to the attention of the BLM-authorized officer. If significant paleontological resources are found, avoidance, recordation, and/or data recovery would be required.
- Any cultural resource discovered by WKM, 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. WKM would be responsible for the cost of evaluation and mitigation. Operations would resume only upon written authorization to proceed from the authorized officer.

#### *Fire Management*

- All applicable local, state, and federal fire laws and regulations would be complied with and all reasonable measures would be taken to prevent and suppress fires in the Project Area.
- In the event the proposed Project activities start or cause a wildland fire, WKM would be responsible for all the costs associated with the suppression. The following precautionary measures would be taken to prevent and report wildland fires:
  - All vehicles would carry fire extinguishers and a minimum of ten gallons of water;
  - Adequate fire-fighting equipment (i.e., shovel, Pulaski, extinguishers), and a minimum ten gallons of water would be kept in each vehicle at the Project; and
  - Welding operations would be conducted in an area free from or mostly free from vegetation. A minimum of ten gallons of water, a shovel, and fire extinguisher would be on hand to extinguish fires created from the sparks. Extra personnel would be at the welding site to watch for fires created by welding sparks. Welding aprons would be used when conditions warrant (i.e., during red flag warnings).
  - Fires would be reported to BLM fire dispatch. The BLM may coordinate with local fire departments for fire suppression activities.

#### *Geology and Mineral Resources*

- Geotechnical monitoring, consisting of geologic structure mapping, ground water monitoring, and slope stability analyses, would be conducted during active mining to

assist in optimizing the final pit designs. Slope movement monitoring also would be conducted to evaluate the safety of the open pit high walls. In addition, operational procedures for controlling blasting and bench scaling would facilitate the mining of stable pit walls.

#### *Hazardous or Solid Wastes*

- Construction, operation and maintenance activities would comply with applicable federal, state, and local laws and regulations regarding the use of hazardous substances and the protection of air and water quality.
- Hazardous waste would be stored in appropriate containers, dumpsters, or barrels which would clearly labeled. Storage containers would be in good repair with no defects and suitable for off-site shipment under NDOT requirements.
- Hazardous wastes would be shipped to an approved location by a certified vendor in accordance with RCRA requirements.

WKM would follow the spill contingency measures outlined in the Emergency Response Plan (Appendix J of the Mine Plan). Measures would include spill response, cleanup, and reporting procedures.

#### *Night Skies*

- To minimize the effects from lighting, WKM would utilize hooded stationary lights and light plants. Lighting would be directed onto the pertinent site only and away from adjacent areas not in use with safety and proper lighting of the active work areas being the primary goal. WKM would utilize lighting designed to reduce the impacts to night skies.

#### *Noxious Weeds, Invasive and Non-native Species*

- WKM would implement the Noxious Weed Monitoring and Control Plan (Appendix L of the Mine Plan) prepared for the Project that would be implemented during construction and continuing through operations. Management strategies include prevention (i.e., monitoring of new weed infestations, and awareness and education), implementation of cultural practices (practices that reduce the potential for weed establishment), and treatment (i.e., mechanical treatment, prescribed burning, chemical treatment, and biological treatment). The results from annual monitoring and treatment would be reported to the BLM and serve as the basis for updating the plan and developing ongoing annual treatment programs.

#### *Protection of Survey Monuments*

- WKM would protect all survey monuments, witness corners, reference monuments, bearing trees, and line trees against destruction, obliteration, or damage. Public land survey system monuments would be protected and preserved in accordance with Nevada BLM IM No. NV-2007-003. If, in the course of operations, any monuments, corners, or accessories are destroyed, WKM would coordinate with the BLM.

- Registered monuments that would be covered or destroyed in the normal course of events by the implementation of the approved Mine Plan would be replaced by WKM at the completion of operations, using GPS technology.

#### *Public Safety*

- Public safety would be maintained throughout the life of the Project by excluding unauthorized access to the mining areas through fencing, security, and traffic-control measures.
- WKM would establish post-mining configuration of access roads in coordination with the BLM and NDEP with a focus on public safety.

#### *Vegetation*

- Revegetation of disturbance areas would be conducted as soon as practicable to reduce the potential for wind and water erosion, minimize impacts to soils and vegetation, help prevent the spread of invasive and non-native species in disturbance areas, and facilitate post-mining land uses. Concurrent reclamation would be conducted to the extent practical to accelerate revegetation of disturbance areas. Sediment and erosion control measures and revegetated areas would be inspected periodically to ensure long-term erosion control and successful reclamation.

Any seed mixes and mulches used for reclamation would be certified weed free.

#### *Visual Resources*

- During operations, the margins of the waste rock dumps would be constructed to provide for variable topography during final regrading, thereby providing a more natural post-mining landscape.
- Concurrent reclamation would be implemented to the extent practicable.

#### *Water Resources*

- BMPs would be used to limit erosion and reduce sediment in precipitation runoff from Project facilities and disturbed areas during construction, operations, and initial stages of reclamation. BMPs may include, but are not limited to, diversion and routing of storm water using accepted engineering practices, such as diversion ditches, and the placement of erosion control devices, such as sediment traps, and rock and gravel cover.
- WKM would limit potential impacts to ground water by closing surface drill holes per NRS 534.
- Process components would be designed, constructed, and operated in accordance with NDEP regulations. Proposed process facilities would be zero discharge and the heap leach pad would have a composite liner system in accordance with NDEP design criteria.

### *Wildlife*

- Land clearing or other surface disturbance associated with the activities within the Project Area would be conducted outside of the avian breeding season, whenever feasible, to avoid potential destruction of active bird nests or young birds in the area. When surface disturbance must be created during the avian breeding season (March 1 through July 31), a qualified biologist would survey the area prior to land clearing activities in accordance with current BLM protocols. Pre-disturbance surveys for migratory birds are only valid for 14 days. If the disturbance for the specific location does not occur within 14 days of the survey, another survey would be needed. However, if the vegetation has been fully cleared from the work area within the 14 day clearance survey time frame, no additional clearance survey would be required for the disturbed area because it would no longer consist of potential migratory bird nesting habitat. If active nests are located, or if other evidence of nesting (i.e., mated pairs, territorial defense, carrying nesting material, transporting of food) is observed, a protective buffer (the size depending on the habitat requirements of the species and location of the nest) would be delineated after consultation with the BLM resource specialist and the entire area avoided, preventing destruction or disturbance to nests until birds are no longer actively breeding or rearing young, or until the young have fledged.
- WKM has prepared a Bird and Bat Conservation Strategy (BBCS) (Appendix A) with commitment to measures that include new surface disturbance performed outside of avian breeding season to the degree possible, performing breeding season surveys prior to any new disturbance activities, posting and enforcing speed limits, removing trash from the site on a regular basis, reporting mortalities to NDOW, incorporating standard raptor protection designs on overhead powerlines, controlling lighting to minimize the potential for bird and bat collisions, installing bat grates/cupolas to protect existing bat habitat, and limiting exposure to hazardous materials. Conservation measures include the design of Project components, monitoring, and adaptive management.
- Following Project construction, areas of disturbed land no longer required for operations would be reclaimed as required by the BLM to promote the reestablishment of native plant and wildlife habitat.
- Operators would be trained to monitor mining and process areas for the presence of larger wildlife such as pronghorn antelope as well as avian and other terrestrial wildlife. Mortality information would be collected in accordance with the NDOW Industrial Artificial Pond Permit. WKM would establish wildlife protection policies that would prohibit the feeding or harassment of wildlife.
- As part of the existing monitoring plan for wildlife, the top of the heap leach pad (s) would be monitored daily for any substantial pooling of cyanide solutions and wildlife mortalities would be reported in accordance with the NDOW Industrial Artificial Pond Permit.
- Areas that are being actively leached on the heap leach pad would be inspected on a daily basis. If any ponding is found on the surface, the cause would be determined and measures taken to eliminate the solution accumulation. Measures can include solution

delivery system repair, adjustment of solution application rates, and ripping of the heap leach pad surface.

- HDPE-lined event pond would include an area of textured pond liner to minimize wildlife entrapment and allow safe egress from the pond.

AT&T would adhere to the same ACEPMs for cultural and paleontological resources and migratory birds as listed above. Additionally, AT&T would also adhere to the following ACEPMs unique to the POD.

During Project construction, the disturbed soil would be wetted, chemically treated, or treated by other means satisfactory to the Authorized Officer, sufficiently in order to effectively reduce airborne dust and reduce soil erosion. Additionally, prudent vehicle speeds would be maintained to minimize fugitive dust created by travel. Construction and maintenance activities would be conducted to minimize disturbance to vegetation. All disturbed areas not required for maintenance would be permanently reclaimed using methods approved by the BLM. All construction vehicle movement outside the ROW would be restricted to the extent practicable.

All federal, state, and county laws, ordinances, rules, and regulations, which pertain to prevention, pre-suppression, and suppression of fires, would be strictly adhered to. All personnel would be advised of their responsibilities under the applicable fire laws and regulations. It would be the responsibility of AT&T to notify the BLM Central Nevada Interagency Dispatch Center at (775) 623-3444, if a Project-related fire occurs within or adjacent to the construction area. Fire extinguishers would be available in the construction area. Water from a water truck that may be used for construction and dust control would be available for fire fighting. AT&T would take aggressive action to prevent and suppress fires on and adjacent to the construction area, and would utilize its workers and equipment on the Project for fighting fires within the construction area.

All construction vehicles would be maintained in accordance with the manufacturers' recommendations. All vehicles would be inspected for leaks prior to entering the jobsite. All discovered leaks would be contained with a bucket of absorbent materials until repairs can be made. Pursuant to 43 CFR 8365.1-1(b)(3), no sewage, petroleum products, or refuse would be dumped from any trailer or vehicle. Hazardous material storage and equipment repair would be conducted at least 100 feet away from ephemeral drainages. Spilled materials of any type would be cleaned up immediately. Shovels and spill kits would be maintained on site at all times to respond to spills. All sanitary wastes would be collected in portable, self-contained toilets in the temporary use area and managed in accordance with local requirements. All solid wastes would be disposed of in a state, federal, or local designated site.

If noxious weeds are encountered within the construction area, mitigation measures would be instituted in consultation with the BLM weed specialist. ROW monitoring and weed abatement following construction would be conducted as required by the BLM. To avoid the spread of noxious weeds, all vehicles brought in from out of the area would go through high pressure washing of the undercarriages at a commercial carwash prior to arriving on site and before being used on the Project.

To minimize erosion from storm water runoff, access roads would be maintained consistent with the BMPs applicable to development roads. BLM BMPs for storm water would be followed, as applicable.

Following Project construction, areas of disturbed land no longer required for operations would be reclaimed as required by the BLM to promote the reestablishment of native plant and wildlife habitat.

## **2.2 Alternatives to the Proposed Action**

Section 6.6.1 of the BLM NEPA Handbook directs that a “...range of alternatives explore alternative means of meeting the purpose and need for the action. ... In determining the alternatives to be considered, the emphasis is on what is reasonable ... Reasonable alternatives include those that are practical or feasible from the technical or economic standpoint and using common sense...” Specific guidance for this EA includes the BLM NEPA Handbook, BMD Office guidance, and the regulations under 43 CFR 3809.

The analysis of alternatives in this EA is based on the following criteria: a) public or agency concern; b) technical feasibility; c) potential to reduce an environmental impact of the Proposed Action; d) ability to meet the purpose of and need for the Proposed Action; and e) compliance with regulatory and legal guidance (i.e., MMPA). In determining the alternatives to be considered, the BLM emphasizes what is “reasonable.” Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint. Though not required, the BLM may elect to analyze in detail an alternative that might otherwise be eliminated from further analysis in order to assist in the planning or decision-making process.

Alternatives to the Proposed Action derived through the scoping process include the following:

- No Action;
- On-Site Water;
- Knapp Avenue Access Only;
- Powerline;
- Elimination of the Fiber Optic Cable Realignment; and
- Other Access Roads.

The following section of the EA discusses alternatives to the Proposed Action and identifies three alternatives that are to be analyzed in the remainder of the EA, in addition to the Proposed Action. The three alternatives include: the No Action Alternative; the On-Site Water Alternative; and the Powerline Alternative.

Mine operations are composed of a number of facility components. There can be alternative means and locations to implement these components in most settings. However, these alternative means are limited by the location of the mineral deposit, land and mineral ownership, and existing physical constraints, both natural and manmade. For the Proposed Action, varying the location of the proposed facilities is constrained by topographic features, existing transportation networks, surface ownership, and ore body location.

### **2.2.1 No Action Alternative**

In accordance with BLM NEPA guidelines H-1790-1, Chapter V (BLM 2008), this EA evaluates the No Action Alternative, which is a reasonable alternative to the Proposed Action. The objective of the No Action Alternative is to describe the environmental consequences that would result if the Proposed Action were not implemented. The No Action Alternative forms the baseline from which the impacts of all other alternatives can be measured.

Under the No Action Alternative, WKM would not be authorized to develop the Project and mine the Three Hills ore body as currently defined under the Proposed Action. The No Action Alternative would result from the BLM disallowing the activities proposed under the Plan (WKM 2014a) and the ROWs. However, WKM would be able to continue exploration activities as outlined in the previously acknowledged Notice. Refer to Section 1.2 for a discussion of the existing Notice-level activities. The area would remain available for future mineral development or for other purposes as approved by the BLM. Any additional activities proposed within the area would be analyzed under their own site-specific NEPA analysis at the time they are proposed.

### **2.2.2 On-Site Water Alternative**

Under this alternative the Project would be developed as outlined in the Proposed Action, except that WKM would construct on-site water wells and associated water tanks and piping to supply the water needs of the Project. In addition, the water pipeline in the Project Area from the Town of Tonopah would not be constructed. Figure 2.2.1 shows the anticipated location of the water wells and the revised Project boundary. Under this alternative there would be approximately six fewer acres of surface disturbance, relative to the Proposed Action because the water pipeline would not be constructed, but the water wells, tanks, and piping would be constructed. Therefore, the total surface disturbance associated with this alternative would be approximately 453 acres.

### **2.2.3 Knapp Avenue Access Only Alternative**

Under this alternative the Project would be developed as outlined in the Proposed Action, except the access to the Project would only be via Knapp Avenue. As a result, WKM have to use Knapp Avenue for the delivery of supplies and equipment to the Project, as well as all employee traffic. Under this alternative the modification to US Highway 95 at the intersection with the South Access Road would not need to occur. As a result, all Project-related traffic would be required to use Knapp Avenue through the Town of Tonopah to access Paymaster Canyon Road (N-92355) and the Project. This alternative would not use the existing South Access Road and approximately one acre of surface disturbance within the NDOT ROW for US Highway 95 would not occur. Therefore, the total surface disturbance associated with this alternative would be approximately 458 acres.

### **2.2.4 Powerline Alternative**

Under this alternative the Project would be developed as outlined in the Proposed Action, except that there would not be on-site power generation. Instead, a powerline from the West Tonopah substation would be constructed adjacent to Paymaster Canyon Road to the Project Area. Figure 2.2.2 shows the location of the powerline and the switching yard in the Project Area. This



0 1,000 2,000 Feet

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**Explanation**

- Project Area
- Fence
- Mine Road
- County Road
- Public Road
- Water Well
- Borrow Source
- Waste Rock Storage Area
- Growth Media Stockpile
- Mine Road
- Heap Leach Pad
- Pit
- Pit Adjustment Zone
- Septic Field
- Stormwater Diversion Channel
- Yard
- Structure
- Pond



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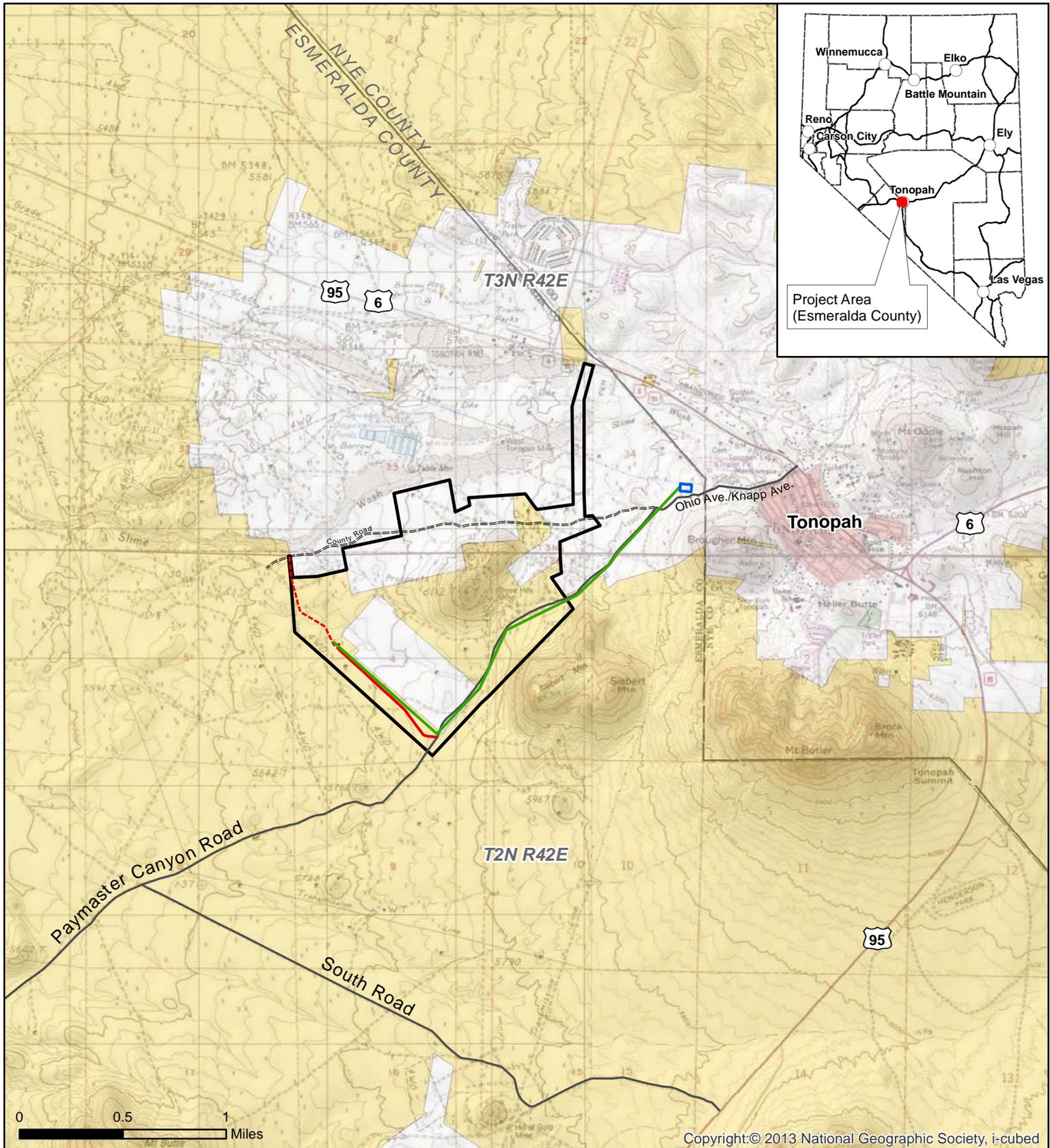
**BUREAU OF LAND MANAGEMENT**

**THREE HILLS MINE PROJECT**

**On-Site Water Alternative**

Figure 2.2.1

10/07/2015



**Explanation**

- Project Area
- Existing Access Routes
- County Road
- Proposed Project Access Road
- Proposed County Road Bypass
- Substation
- Powerline

**Land Status**

- Bureau of Land Management
- Forest Service
- Private



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**BUREAU OF LAND MANAGEMENT**

**THREE HILLS MINE PROJECT**

**Powerline Alternative  
 Powerline Route**

Figure 2.2.2

10/07/2015

alternative would result in approximately 80 acres of additional surface disturbance, as compared to the Proposed Action. This disturbance would be associated with the powerline corridor. Therefore, the total surface disturbance associated with this alternative would be 539 acres. A separate ROW for the powerline would be required to implement this alternative.

## **2.2.5 Alternatives Considered but Eliminated from Further Analysis**

Several alternatives were identified for consideration in this EA. The following are discussions of those alternatives identified through the scoping process that have been eliminated from detailed consideration in this EA. Alternatives were considered relative to the criteria outlined in Section 2.2.

### **2.2.5.1 Elimination of Fiber Optic Cable Realignment Alternative**

Under this alternative the existing fiber optic cable that traverses the Project Area from north to south through the open pit would not be realigned. See Figure 2.1.4 for the location of the fiber optic cable. Implementation of this alternative would create one of two scenarios. The first scenario is the mining of the open pit could not occur because the fiber optic cable would be in the way.

This scenario is essentially the same alternative as the No Action Alternative, which is described in Section 2.2.1. The second scenario is that the mine would move forward and the fiber optic cable would be severed. The severing of the fiber optic cable would result in the disruption of the major data connection between Reno and Las Vegas. This disruption would likely result in substantial economic impacts and interruptions in government services and activities. Therefore, this alternative has been eliminated from detailed consideration.

### **2.2.5.2 Other Access Roads Alternative**

Under this alternative, other Esmeralda County claimed roads on public land would be used to connect US Highway 95 to Paymaster Canyon Road. These types of roads are located north of Paymaster Canyon Road and the Project Area, and connect US Highway 95, north of the Town of Tonopah, and Paymaster Canyon Road. However, all these roads are narrow, in poor condition, and must cross a major ephemeral drainage. As a result, this alternative would result in additional surface disturbance, surface water impacts, and air quality impacts. Therefore, this alternative has been eliminated from detailed consideration.

### 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

#### 3.1 Introduction

The purpose of this section of the EA is to describe the existing environment of the Project Area, as well as environmental consequences from implementation of the Proposed Action or any of the identified alternatives.

Supplemental Authorities, subject to requirements, are specified by statute or EO and must be considered in all BLM environmental documents. The elements associated with the supplemental authorities listed in the NEPA Handbook (BLM 2008, Appendix 1) and in the Nevada IM 2009-030, Change 1, are listed in Table 3.1-1. The table lists the elements and the determination of whether the element is present in the Project Area and if the element would be affected by the Proposed Action.

**Table 3.1-1: Elements Associated with Supplemental Authorities and Rationale for Detailed Analysis for the Proposed Action**

Supplemental Authority Element	Not Present	Present/ Not Affected	Present/ May be Affected	Rationale/Reference Section
Air Quality			X	See Section 3.2.
Area of Critical Environmental Concern (ACEC)	X			This element is not present within the Project Area or vicinity and is not further analyzed in this EA.
Bald and Golden Eagles			X	See Section 3.17 (Special Status Species).
Cultural Resources			X	See Section 3.3.
Environmental Justice	X			Based on a review of existing baseline data, the aggregate population of all minority groups combined in the Socioeconomics assessment area does not exceed 50 percent of the total population in the assessment area. In addition, the potential effects of the Proposed Action would not be expected to disproportionately affect any particular population. This element is not present within the Project Area or vicinity and is not further analyzed in this EA.
Farmlands (Prime or Unique)	X			This element is not present within the Project Area or vicinity and is not further analyzed in this EA.
Fish Habitat	X			This element is not present within the Project Area or vicinity and is not further analyzed in this EA.
Floodplains	X			This element is not present within the Project Area or vicinity and is not further analyzed in this EA.
Forests and Rangelands (Healthy Forest Restoration Act Projects only)	X			This Project does not meet the requirements to qualify as an HFRA project.

<b>Supplemental Authority Element</b>	<b>Not Present</b>	<b>Present/ Not Affected</b>	<b>Present/ May be Affected</b>	<b>Rationale/Reference Section</b>
Human Health and Safety (Herbicide Projects)	X			This Project may use herbicides to eradicate noxious weeds as stated in the Noxious Weed Management Plan for the Project; however, EO 13045, "Protection of Children from Environmental Health Risks and Safety Risks", would not apply to this Project as there would be no children on the mine site.
Migratory Birds			X	See Section 3.7.
Native American Concerns			X	See Section 3.8.
Noxious Weeds, Invasive Non-native Species			X	See Section 3.10.
Threatened or Endangered Species	X			This element is not present but is discussed further in Section 3.17 (Special Status Species).
Wastes-Hazardous/Solid			X	See Section 3.21.
Water Quality, Surface and Ground			X	See Section 3.22.
Wetlands and Riparian Zones	X			This element is not present within the Project Area or vicinity and is not further analyzed in this EA.
Wild and Scenic Rivers	X			This element is not present within the Project Area or vicinity and is not further analyzed in this EA.
Wilderness/Wilderness Study Areas (WSAs)/Lands with Wilderness Characteristics	X			Wilderness or WSAs are not present within the Project Area or vicinity. The Project Area is substantially affected by human imprints, does not have opportunities for solitude or primitive recreation, and does not have an adequate size to contain land with wilderness characteristics. These elements are not further analyzed in this EA. Lands with Wilderness Characteristics was identified as not present not affected based on an inventory of Lands with Wilderness Characteristics completed in 2012 for BMD, as part of the Resource Management Plan Revision in progress for the District. That inventory did not show any areas meeting the criteria for Lands with Wilderness Character in the Project area, and the proposed project activities would not impact any Lands with Wilderness Character. The inventory also will be updated as the Resource Management Plan Revision further progresses for the whole BMD.

Elements present are analyzed in Sections 3.2 through 3.22, including justification for the elements present and determination as to whether or not the elements are affected by the Proposed Action and the identified alternatives. Those elements listed under the supplemental authorities that do not occur in the Project Area and not affected are not evaluated further in this EA, based on the rationale provided in Table 3.1-1.

In addition to the elements listed under supplemental authorities, the BLM considers other resources and uses, which occur on public lands, and the issues that may result from the implementation of the Proposed Action or the identified alternatives. Other resources or uses of the human environment considered for this EA are listed in Table 3.1-2 below.

**Table 3.1-2: Resources or Uses Not Associated with Supplemental Authorities**

Other Resources or Uses	Not Present	Present/ Not Affected	Present/ May be Affected	Rationale/Reference Section
Fire Management		X		See Section 3.4.
Forestry and Woodland Resources	X			This resource is not present within the Project Area or vicinity and is not further analyzed in this EA.
Geology and Mineral Resources			X	See Section 3.5.
Lands and Realty			X	See Section 3.6.
Noise			X	See Section 3.10.
Paleontological Resources		X		See Section 3.11.
Public Safety			X	See Section 3.12.
Rangeland Management			X	See Section 3.13.
Recreation			X	See Section 3.14.
Socioeconomics			X	See Section 3.15.
Soils			X	See Section 3.16.
Special Status Species (Plants and Wildlife)			X	See Section 3.17.
Transportation/Traffic			X	See Section 3.18.
Vegetation			X	See Section 3.19.
Visual Resources			X	See Section 3.20.
Wild Horses and Burros	X			There have been no reports of horses using areas within the Project boundaries. Horses do occasionally use a spring located approximately one mile northwest of the Project, but not on a consistent basis. The BLM monitored the spring area on June 1, 2015, and did not observe any animals or any fresh sign.
Wildlife (General)			X	See Section 3.23.

## 3.2 Air Quality

### 3.2.1 Affected Environment

The Federal Clean Air Act is the primary controlling legislation over air quality. Ambient air quality and the emissions of air pollutants are regulated under both federal and state laws and regulations. Regulatory air standards that are potentially applicable to the Project include the following: National Ambient Air Quality Standards (NAAQS) and the Nevada State Ambient Air Quality Standards (Nevada AAQS).

The Bureau of Air Pollution Control (BAPC) is the agency in the State of Nevada delegated with the responsibility for implementing a State Implementation Plan (SIP) (excluding Washoe and Clark Counties, which have their own SIP). Included in a SIP are the State of Nevada air quality permit programs (NAC 445B.001 through 445B.3791, inclusive). Also part of a SIP is the Nevada AAQS. The Nevada AAQS are generally identical to the NAAQS with the exception of the following: a) an additional one hour ozone (O<sub>3</sub>) standard for Lake Tahoe Basin #90; b) an additional standard for carbon monoxide (CO) in areas with an elevation in excess of 5,000 feet amsl; and c) a hydrogen sulfide standard. The amendment to NAC 445B.22097 effective January 1, 2015, sets the Nevada AAQS for particulate matter of aerodynamic diameter less than 2.5 microns (PM<sub>2.5</sub>), revokes the annual standard for particulate matter of aerodynamic diameter less than ten microns (PM<sub>10</sub>), and sets the one hour standards for sulfur dioxide (SO<sub>2</sub>) and nitrogen dioxide (NO<sub>2</sub>). In addition to establishing the Nevada AAQS, the BAPC is also responsible for the Prevention of Significant Deterioration (PSD) program, enforcing the New Source Performance Standards (NSPS), implementing the Federal Operating Permit Program (Title V), and Nevada Mercury Control Program (NMCP) throughout the State of Nevada.

Mercury emissions to the atmosphere come from both background and man-made or anthropogenic sources. Background sources of mercury include natural sources such as naturally enriched soils and volcanoes. There are both global and local anthropogenic sources of mercury. When bound in mineral forms that typically appear in ore (e.g., cinnabar), mercury is a stable compound that remains in solid form. Ore processing has the potential to liberate mercury from these stable minerals by dissolving it in process solutions. Due to the boiling point of 675 °F, mercury has the potential to volatilize into a gaseous form when subjected to thermal processes in a recovery and refining circuit. Mercury is not considered a criteria pollutant, and no NAAQS have been established under the Clean Air Act Amendments for mercury. Mercury is included on the federal list of hazardous air pollutants (HAPs), which has been adopted by reference in the Nevada air quality regulations. Nevada air quality regulations (NAC 445B.349) prohibit the “discharge into the atmosphere from any stationary source of any hazardous air pollutant or toxic regulated air pollutant that threatens the health and safety of the general public, as determined by the director.” The EPA has issued a final rule on a National Emissions Standard for HAPs (NESHAPs) for gold mines and gold processing facilities (40 CFR 63 Subpart EEEEEEE). The rule establishes NESHAPs for mercury emissions from gold ore processing facilities. For existing ore pretreatment processes, the emissions limit is no more than 127 pounds of mercury per million tons of ore processed. HAPs are controlled through emissions limits at the source rather than ambient air concentrations. Mercury emissions associated with precious metals operations are regulated and controlled pursuant to the Nevada Mercury Control Program (NAC 445B.3611-3689).

#### 3.2.1.1 Existing Conditions

Air quality in the Project Area is governed by both factors of pollutant emissions and meteorological conditions. The Project Area is located in the Central Region Hydrographic Basin 10, which is considered in attainment relative to the NAAQS and Nevada AAQS and is not a PSD-triggered basin for any pollutant. The existing air quality is typical of largely undeveloped regions of the western US with limited sources of pollutants. The attainment status relative to the applicable ambient air quality standards within the Project Area is determined by monitoring ambient levels of criteria pollutants. An attainment or unclassified designation means

no violations of Nevada AAQS and NAAQS have been documented in the region or that there is insufficient monitoring data to make an attainment determination. Baseline air quality and meteorological conditions representative of the Project Area per the Nevada AAQS and NAAQS were assessed in the Air Quality Impact Assessment (AQIA) (Enviroscientists, Inc. [Enviroscientists] 2015).

### 3.2.1.2 Climate and Meteorology

Climate represents the long-term statistical characterization of daily, seasonal, and annual weather conditions such as temperature, relative humidity, precipitation, cloud cover, solar radiation, and wind speed and direction. Climate is the composite of generally prevailing weather conditions of a particular region throughout the year, averaged over a series of years. A region's climate is affected by latitude, terrain, and altitude, as well as nearby water bodies and their currents.

The Project Area is located approximately one mile west of Tonopah, Nevada, at the southern extent of the San Antonio Range, at elevations ranging from 5,600 feet amsl to 6,100 feet amsl. According to the Western Regional Climate Center (WRCC), the average maximum temperature at the Tonopah weather station, located approximately seven miles east of the Project Area, is 88.3 degrees Fahrenheit (°F) in July, and the average minimum temperature is 28.4 °F in January. The average annual precipitation is approximately 4.9 inches with average monthly precipitation rates ranging from 0.3 inch in June to 0.5 inch in spring and early fall (WRCC 2014).

### 3.2.1.3 Climate Change

#### *Current Conditions*

The BLM published the final Rapid Ecoregional Assessment (REA) for the Central Basin and Range in June 2013 (Comer et al. 2013). REAs examine climate change and other widespread environmental influences that are affecting western landscapes. REAs look across an ecoregion to more fully understand ecological conditions and trends; natural and human influences; and opportunities for resource conservation, restoration, and development. The REAs provide regional information that can inform local management efforts.

Over the past 100 years, the weather, vegetation cover, and wildfire regimes of the Central Basin and Range ecoregion have changed, suggesting a change in the ecoregion's climate regime. Changes in temperature and precipitation have resulted in changes to vegetation cover and wildfire regimes. Changes are expressed in species composition, changes in vegetation communities, and increasing quantities of invasive species. Many areas once dominated by sagebrush have piñon-juniper encroachment as well as downy brome (cheatgrass).

#### *Greenhouse Gas Emissions*

Greenhouse gases (GHGs) are those that allow short-wave solar radiation to enter the earth's surface and then absorb some fraction of the long-wave energy radiated upward into the atmosphere. GHGs can affect climate patterns, which in turn can affect resource management.

Gases exhibiting greenhouse properties come from both natural and human sources. Water vapor, carbon dioxide, methane, and nitrous oxide are examples of GHGs that have both natural and man-made sources, while other GHGs, such as chlorofluorocarbons, are exclusively man-made.

### *Trends*

Warmer and more arid conditions, coupled with a shorter snow season, have led to limited water supplies and severe drought in parts of the state. By 2100, the average temperature in Nevada is predicted to increase by three °F to four °F in the spring and fall and by five °F to six °F in the summer and winter. El Niño also is predicted to increase in frequency and duration as a result of global climate change. These temperature changes would affect evaporation and precipitation in the state, likely resulting in the decreased availability of water (National Conference of State Legislatures 2008).

In the Central Basin and Range ecoregion, climate models suggest there is no strong trend toward either wetter or drier conditions either in the near future (through the 2020s) or in the long term (through the 2050s) (Comer et al. 2013). However, models show significant increases in maximum monthly temperatures by 2020, primarily in the summer months (July, August, and September). The highest maximum temperature increase projected is six °F. These increases are predicted to occur mostly in the southern and northeastern edges of the ecoregion. Forecasts for 2060 predict substantial increases in maximum temperature for all months. Similar to forecasts for 2020, the greatest increases are predicted during the summer months and along the southern and northeastern edges of the ecoregion (Comer et al. 2013). Model forecasts for minimum temperatures show a considerable change in both rate and magnitude over most of the ecoregion. July through September for the 2020s showed the greatest degree of change over most of the ecoregion.

Data for precipitation suggest no strong trend toward either wetter or drier conditions in any month for the ecoregion. With the exception of a slight increase in summer monsoon rains toward the south and east, there were no significant forecasted trends in precipitation for any other months in either the near-term (2020s) or midcentury (2050s) projections (Comer et al. 2013).

Potential effects of these forecasts on the landscape could include increased fuel loads in higher elevations, increased frequency and duration of droughts, expansion of invasive species in higher elevations, increased wind erosion, and changes in wildfire regimes (Comer et al. 2013). As outlined, the effects of climate change are global in nature. As such, impacts both to and from climate change related to the Proposed Action within the Project Area greatly exceed the scope of this analysis and are not further analyzed in this EA.

## **3.2.2 Effects of the Proposed Action**

### **3.2.2.1 Direct and Indirect Effects**

The activities associated with the Proposed Action, primarily the open pit configuration, ADR processing plant and refinery, heap leach pad, and WRSA consist of numerous activities and actions, each of which may have the potential to emit air pollutants. These activities would occur

during the construction phase, as well as during the operational phase of the Project. The potential impacts associated with the construction phase of the facilities would principally consist of fugitive dust and combustion emissions from surface disturbing activities associated with the construction of the facilities. These emissions from the construction activities would be very similar to the emissions associated with the actual mining activity but would be less due to the smaller equipment and limited footprint of the surface disturbance and limited aerial extent of the activities. In addition, the construction activities would not all occur at one time. Therefore, the AQIA analyzed the impacts of air emissions associated with the operational phase of the activities proposed in the Plan and is sufficiently conservative to incorporate the construction impacts in any given year.

WKM has submitted a Class II Air Quality Operating Permit application, a Class I Operating Permit to Construct (OPTC) application, and a Mercury Operating Permit to Construct (MOPTC) application to the BAPC to comply with the applicable 40 CFR Part 63 Subpart E requirements and the NMCP requirements, respectively. These permit applications are under review, and if/when they are approved, the Project would be able to start construction and operation of the activities associated with the Proposed Action. The MOPTC also includes the de minimis units that emit less than five pounds per year of Hg without controls.

*Summary of Air Dispersion Modeling Results*

The emissions for the regulated pollutants were modeled using the EPA-approved AERMOD dispersion modeling system and background pollutant concentrations were added for comparison to the NAAQS and Nevada AAQS for compliance demonstration. The results of the dispersion modeling for the Proposed Action are presented in Table 3.2-1. For all pollutant-averaging time combinations, the Proposed Action modeled ambient concentrations are below the applicable ambient air quality standards at any point of public access, even with the addition of the ambient background concentrations.

**Table 3.2-1: Model Results and Comparison with NAAQS**

Pollutant		Averaging Period	Total Ambient Concentration ( $\mu\text{g}/\text{m}^3$ )	Standard ( $\mu\text{g}/\text{m}^3$ )
Carbon Monoxide (CO)		8-hour	174.49	10,000
		1-hour	524.57	40,000
Lead (Pb)		3-month Average	0.13	0.15
Nitrogen Dioxide (NO <sub>2</sub> )		1-hour	183.85	188
		Annual	18.11	100
Particulate Matter	PM <sub>2.5</sub>	Annual	6.17	12
		24-hour	22.87	35
	PM <sub>10</sub>	24-hour	77.22	150
Sulfur Dioxide (SO <sub>2</sub> )		1-hour	2.22	196
		3-hour	2.03	1,300
		Annual	0.13	80

Note:  $\mu\text{g}/\text{m}^3$  = micrograms per cubic meter; PM<sub>2.5</sub> = particulate matter of aerodynamic diameter less than 2.5 microns; PM<sub>10</sub> = particulate matter of aerodynamic diameter less than ten microns.  
Total Ambient Concentration = Maximum Modeled Concentration plus Background Concentration.

### *PM<sub>10</sub> and PM<sub>2.5</sub> Emissions and Modeled Concentrations*

PM<sub>10</sub> and PM<sub>2.5</sub> emissions are generated by almost all sources. The major sources of PM<sub>10</sub> and PM<sub>2.5</sub> emissions from the Proposed Action would include resuspension of unpaved road dust from haul trucks, wind erosion from disturbed surfaces, as well as blasting operations.

One of the direct impacts to air quality would be the maximum modeled ambient PM<sub>10</sub> concentrations, which is presented in the modeling analysis, including background concentrations at any point of public access as 77.22 µg/m<sup>3</sup> for a 24-hour time period. Another direct impact to air quality would be the maximum modeled ambient PM<sub>2.5</sub> concentrations, which is presented in the modeling analysis, including background concentrations at any point of public access as 22.87 µg/m<sup>3</sup> for a 24-hour time period and 6.17 µg/m<sup>3</sup> for the annual period.

The PM<sub>10</sub> and PM<sub>2.5</sub> emissions from employee trips using Project vehicles and truck deliveries on public roads to and from the Project Area would total 5.47 tons per year (tpy) and 0.84 tpy, respectively (Enviroscientists 2015a). These emissions would be from engine exhaust, tire and brake wear, and fugitive dust generated from paved and unpaved roads. These emissions would have an incidental impact on the air quality in the vicinity of the transportation route.

### *Combustion Emissions and Modeled Concentrations*

Combustion of diesel in the haul trucks and mobile equipment, (e.g., loaders, dozers, etc.), the combustion of propane in processing units such as the furnaces, and the combustion of fuel oil, natural gas or diesel in units such as the generators can produce elevated ambient levels of CO, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub>. In most cases, combustion emissions are generally uncontrolled for the emissions units.

The direct impact to air quality from the fuel combustion is represented by the maximum modeled CO, NO<sub>2</sub>, and SO<sub>2</sub> concentrations from the modeling analysis, which shows levels to be below the NAAQS and the Nevada AAQS (Enviroscientists 2015a).

The CO, NO<sub>2</sub>, SO<sub>2</sub>, and volatile organic compounds (VOC) emissions from the employee trips and truck deliveries on public roads, to and from the Project site, would total 4.48, 8.13, 0.02, and 0.34 tpy, respectively (Enviroscientists 2015a). These emissions would be from engine exhaust.

There are no identified indirect impacts to air quality from the fuel combustion.

#### 3.2.2.2 Hazardous Air Pollutants Emissions

Annual Project HAPs emissions were calculated to determine if the Project constituted a major HAPs source. HAPs emissions from the Project would result from the handling of earthen materials, the combustion of the hydrocarbon fuels, the operation of thermal units, and the handling and use of various chemicals (Enviroscientists 2015a). A summary of the total HAPs emissions in tpy emitted from the Project is presented in Table 3.2-2. The combined HAP emissions from combustion, fugitive, mining and processing sources of the Proposed Action were estimated to be 2.76 tpy.

**Table 3.2-2: Hazardous Air Pollutant Emissions for the Project**

HAPs	Facility Total (tpy)	HAPs	Facility Total (tpy)
Benzene	0.064	Toluene	0.040
Xylenes	0.021	Formaldehyde	0.34
Acetaldehyde	0.51	Acrolein	0.31
Naphthalene	0.0094	Antimony	0.00088
Arsenic	0.030	Beryllium	0.00062
Cadmium	0.00046	Chromium	0.049
Cobalt	0.0010	Cyanide (Hydrogen Cyanide)	0.0010
Lead	0.045	Manganese	0.11
Mercury	0.059	Nickel	0.0015
Selenium	0.00078		
<b>Total</b>			<b>2.76</b>

EPA thresholds for any single HAP or all HAPs combined are ten and 25 tpy, respectively. With the exception of Pb, there are no ambient air quality standards for HAPs. There are no single or combined HAPs more than ten and 25 tpy, respectively, for the Project.

### 3.2.2.3 Climate Change Effects

Sources of GHG emissions in the Project Area include vehicle combustion emissions, stationary combustion sources and generators, mining and mineral exploration and reclamation, and recreational activities. GHG emissions from the Project construction and operations specifically include CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions from combustion units (Enviroscientists 2015a).

GHG emissions associated with the Proposed Action would primarily be associated with the consumption of energy for mining and ore processing during the life of the Three Hills mine. The estimate of the GHG emissions for the Proposed Action is 23,626 metric tons of carbon dioxide equivalent (CO<sub>2</sub>e) as summarized in Table 3.2-3.

**Table 3.2-3: Proposed Project GHG Emissions**

GHG	Metric Tons
CO <sub>2</sub> e	23,626

The national annual emissions of GHG are approximately 6,700 million metric tons (MMt) (EPA 2015). In comparison to the currently estimated state, national, and global GHG emissions, the GHG emissions from the Proposed Action are less than one percent and considered less than significant.

The assessment of climate-changing pollutant emissions and climate change is in its formative phase; therefore, it is not yet possible to assess with confidence the net impact of GHG emissions to climate. The lack of scientific tools designed to predict climate change on a regional or local scale limits the ability to quantify potential future impacts; therefore, an established methodology does not yet exist to accurately predict the effect of these local and regional activities on global climate change and is beyond the scope of this analysis.

### **3.2.3 Effects of the Powerline Alternative**

Under the Powerline Alternative, the Project operations would be similar to the Proposed Action, except the construction disturbance and associated fugitive dust and combustion emissions would increase slightly due to construction of the powerline to the Project. During the operation of the mine the power demand would be provided by the electrical grid and the on-site power generation would not be needed. Therefore, the Proposed Action model is an over estimation of the potential air quality impacts associated with the operational phase under the Powerline Alternative. The Powerline Alternative would not result in air quality impacts greater than the ambient air quality standards.

### **3.2.4 Effects of the On-Site Water Alternative**

Under the On-Site Water Alternative, the Project operations would be essentially the same as under the Proposed Action, except the construction disturbance and associated fugitive dust and combustion emissions would be slightly less due to elimination of the pipeline from the Project north to the Town of Tonopah water connection. Under this alternative there would be some additional construction activities and associated fugitive dust and combustion emissions with the water well construction, water pipeline construction from the well to the point of supply to the project, and water tanks installation. During the operation of the mine the power demand for the water well would increase to load requirements on the generator used for on-site power generation. This additional power demand would be able to be met by the planned generator. The modeling completed for the Proposed Action used the generator at full load; therefore, the Proposed Action model is representative of the potential air quality impacts associated with the operational phase under the On-Site Water Alternative. The On-Site Water Alternative would not result in air quality impacts greater than the ambient air quality standards.

### **3.2.5 Effects of the Knapp Avenue Access Only Alternative**

Under the Knapp Avenue Access Only Alternative, the Project operations would be essentially the same as under the Proposed Action, except the construction and delivery traffic would use Knapp Avenue rather than the South Access Road, which would result in less fugitive dust since the South Access Road is not paved and Knapp Avenue is paved. The modeling completed for the Proposed Action is representative of the potential air quality impacts associated with the operational phase under the Knapp Avenue Access Only Alternative, which would be the same as the Proposed Action with vehicle emissions occurring in different locations. The Knapp Avenue Access Only Alternative would not result in air quality impacts greater than the ambient air quality standards.

### **3.2.6 Effects of the No Action Alternative**

Under the No Action Alternative, air quality impacts associated with the Project would not occur. WKM would not be authorized to develop the Project and mine the ore body as described in the Proposed Action. However, the currently authorized exploration in the Project Area could continue, which would result in fugitive dust emissions and combustion emissions.

### **3.3 Cultural Resources**

Title 54 United States Code (USC) Section 300101, et seq., commonly known as the National Historic Preservation Act of 1966 as amended (NHPA), USC Section 300108, commonly known as Section 106 of the NHPA of 1966 (Section 106), and the implementing regulations under 36 CFR 800 require all federal agencies to consider effects of federal actions on cultural resources eligible for or listed in the NRHP. Other laws related to the NHPA with which agencies must comply include, but are not limited to, the following:

- Archaeological Resource Protection Act (ARPA);
- American Indian Religious Freedom Act of 1978 (AIRFA); and
- Native American Graves Protection and Repatriation Act of 1990 (NAGPRA).

#### **3.3.1 Affected Environment**

##### **3.3.1.1 Direct Effects Area**

In 2014, a Class III cultural resources inventory within a 1,012-acre area, which included the Project Area was conducted (Johnson and McQueen 2015; Sigler and Johnson 2015). The inventory resulted in the identification of 27 newly recorded sites, two previously recorded sites, one object treated as an architectural resource, and 16 isolates. All 29 sites and the one architectural object are recommended as not eligible for listing in the NRHP under any evaluation criteria and the BLM determined that none of the sites are eligible for listing in the NRHP. Based on the State Protocol Agreement between the Bureau of Land Management and the Nevada State Historic Preservation Office for Implementing the National Historic Preservation Act (Protocol), isolates are categorically excluded from inclusion on the National Register of Historic Places (NRHP) (BLM and Nevada State Historic Preservation Office [SHPO] 2014).

##### **3.3.1.2 Indirect Effects Area**

The Protocol and 36 CFR Part 800 require an analysis of a project's indirect effects to cultural resources. Indirect effects to cultural resources include visual, audible, atmospheric, and secondary physical effects (BLM and Nevada SHPO 2014). The BLM established a ten-mile radius around the Project's area of direct effects as the area within which the Project's indirect effects to cultural resources would be identified and assessed. Within the ten-mile radius, the BLM identified four discrete areas of concern that corresponded to the following four potential indirect effects: vibrational, visual, auditory, and atmospheric (Blustain 2015).

The vibrational area of concern was defined as the area within 2,190 feet of proposed mine blasting activities (see Section 3.5 for the blasting vibration analysis). The visual area of concern was defined as the Project viewshed within the ten-mile radius of the Project's area of direct effect (see Section 3.20 for the visual analysis). The auditory area of concern was determined to be the area outlined in the noise modeling for the Project that encompassed the 40 decibels (dBA) (see Section 3.9). Finally, using the air quality impact analysis (see Section 3.2 for the air quality impact analysis), it was determined the Project's atmospheric effects would be temporary and negligible, meaning no further analysis of this area of concern was necessary for the indirect effects analysis (Blustain 2015). A Class I literature search for the vibrational, visual, and

auditory areas of concern was completed and assessed the Project's indirect effects (Blustain 2015). Forty-seven archaeological sites and two architectural resources within the area of indirect effects were identified, beyond those resources identified in the area of direct effects.

### **3.3.2 Effects of the Proposed Action**

#### **3.3.2.1 Direct Effects**

Direct effects to cultural resources include direct, physical disturbance to cultural resources. Based on the results of the Class III cultural inventory, direct effects to as many as 29 archaeological sites, one architectural resource, and 16 isolated finds would occur. However, all these sites, objects, and isolates are considered not eligible for the NRHP. In addition, the Proposed Action identifies that inadvertent discoveries of previously undetected cultural resources would be treated as required under 43 CFR 10.4, 43 CFR 3809.420(8)(b), and Section IV of the Protocol. Any such discovery would be immediately reported to the authorized BLM officer. All operations in the immediate area of the discovery would be suspended, and the site would be protected until the authorized officer could develop an appropriate plan for management of the resource. No direct adverse effects to historic properties are anticipated as a result of implementation of the Proposed Action.

#### **3.3.2.2 Indirect Effects**

Indirect effects to cultural resources include actions or activities that may have vibrational, visual, auditory, or atmospheric effects to the resources. The Proposed Action has the potential to indirectly affect up to an additional 49 cultural sites and resources. However, none of these 49 resources would be indirectly adversely affected by the Project (Blustain 2015). Therefore, the Project has no indirect adverse effect on historic properties.

### **3.3.3 Effects of the Powerline Alternative**

#### **3.3.3.1 Direct Effects**

Under the Powerline Alternative, the mining operations and the blasting activities would be the same as under the Proposed Action. This alternative would result in similar impacts to cultural resources as the Proposed Action.

#### **3.3.3.2 Indirect Effects**

Under the Powerline Alternative, the mining operations would have essentially the same visual, vibrational, auditory, and atmospheric characteristics as under the Proposed Action. This alternative would result in similar impacts to cultural resources as the Proposed Action.

### **3.3.4 Effects of the On-Site Water Alternative**

#### **3.3.4.1 Direct Effects**

Under the On-Site Water Alternative, the mining operations and the blasting activities would be the same as under the Proposed Action. This alternative would result in the same impacts to cultural resources as the Proposed Action.

#### **3.3.4.2 Indirect Effects**

Under the On-Site Water Alternative, the mining operations would have essentially the same visual, vibrational, auditory, and atmospheric characteristics as under the Proposed Action. This alternative would result in similar impacts to cultural resources as the Proposed Action.

### **3.3.5 Effects of the Knapp Avenue Access Only Alternative**

#### **3.3.5.1 Direct Effects**

Under the Knapp Avenue Access Only Alternative, the mining operations and the blasting activities would be the same as under the Proposed Action. This alternative would result in the same impacts to cultural resources as the Proposed Action.

#### **3.3.5.2 Indirect Effects**

Under the Knapp Avenue Access Only Alternative, the mining operations would have essentially the same visual, vibrational, auditory, and atmospheric characteristics as under the Proposed Action. This alternative would result in similar impacts to cultural resources as the Proposed Action.

### **3.3.6 Effects of the No Action Alternative**

#### **3.3.6.1 Direct Effects**

Based on the results of the Class III cultural inventory, there are 29 archaeological sites and 17 isolated finds within the Project Area. None of the sites or isolates within the area surveyed is considered eligible for the NRHP. Therefore, the No Action Alternative would not impact significant cultural resources.

#### **3.3.6.2 Indirect Effects**

Under the No Action Alternative, the ongoing exploration activities would not have any meaningful visual, vibrational, auditory, or atmospheric characteristics that would result in any indirect effects.

### **3.4 Fire Management**

#### **3.4.1 Affected Environment**

No fuel reduction or habitat enhancement projects have been conducted or are proposed within the Project Area. In addition, the Proposed Action includes ACEPMs that would minimize Project-related fires.

#### **3.4.2 Effects of the Proposed Action**

Due to the lack of BLM fuels management activities in the Project Area and the limited amount of fuels (vegetation) in the Project Area, the Proposed Action would not have an effect on Fire Management.

#### **3.4.3 Effects of the Powerline Alternative**

Due to the lack of BLM fuels management activities in the Project Area and the limited amount of fuels (vegetation) in the Project Area, the Powerline Alternative would not have an effect on Fire Management.

#### **3.4.4 Effects of the Knapp Avenue Access Only Alternative**

Due to the lack of BLM fuels management activities in the Project Area and the limited amount of fuels (vegetation) in the Project Area, the No South Access Road Alternative would not have an effect on Fire Management.

#### **3.4.5 Effects of the On-Site Water Alternative**

Due to the lack of BLM fuels management activities in the Project Area and the limited amount of fuels (vegetation) in the Project Area, the On-Site Water Alternative would not have an effect on Fire Management.

#### **3.4.6 Effects of the No Action Alternative**

Due to the lack of BLM fuels management activities in the Project Area and the limited amount of fuels (vegetation) in the Project Area, the No Action Alternative would not have an effect on Fire Management.

### **3.5 Geology and Mineral Resources**

The US Congress established the right to access and develop mineral resources on open lands administered by the Federal Government under the 1872 General Mining Law. This law has been amended many times since its passage; however, the underlying right to access and develop minerals has remained in the General Mining Law. Limitations on the development of minerals under the General Mining Law have been established by the US Congress in their passage of the various environmental laws (i.e., Clean Water Act [CWA], Clean Air Act [CAA], Endangered Species Act [ESA], etc.). The BLM has been charged by the US Congress with the management

of activities on public lands under the General Mining Law. The BLM implements this management through regulations at 43 CFR 3809.

The US Congress has passed two laws that establish the policy for the development of mineral resources in the US. These acts are the MMPA and the Materials and Minerals Policy Research and Development Act of 1980. Congress declared that the national mineral policy is "...to foster and encourage private enterprise in (1) the development of economically sound and stable domestic mining, minerals, metal and mineral reclamation industries, (2) the orderly and economic development of domestic resources, reserves, and reclamation of metals and minerals to help assure satisfaction of industrial, security, and environmental needs ...". The 1980 Act reiterates these statements from the 1970 Act.

Construction of mine facilities is regulated by standards of the Uniform Building Code (UBC). Esmeralda County currently defaults to the State of Nevada which uses the 2006 version of the International Building Code. The seismic zone designations in Esmeralda County within the vicinity of the Project are zones 3 and 4 on a scale ranging from 1 (indicating less damage expected) to 4 (indicating the most damage expected). Esmeralda County does not have specific regulations for building construction.

### **3.5.1 Affected Environment**

#### **3.5.1.1 Regional Geology**

The Three Hills deposit consists of three closely grouped hills of moderate relief (300 to 400 feet), which are called North, South and East Hills. All of the potentially economic mineralization is found on North and South Hills, which are comprised of a 100- to 400-foot thick sequence of variably silicified Siebert Formation crystal tuffs, volcanoclastic siltstones and sandstones and minor conglomerates, which overlie the Fraction rhyolitic lithic crystal tuff breccias. The section has been intruded by Oddie rhyolite and hydrothermal breccias and cut by a series of north-south and northwest-southeast trending structures. Mineralization is largely confined to silicified portions of the Siebert Formation and the upper 20 feet of the Fraction Tuff, with a pronounced increase in gold and silver concentrations near the Siebert-Fraction contact. East Hill consists of a 300- to 400-foot thick section of strongly argillized, weakly silicified, weakly mineralized, Siebert Formation crystal tuffs, and volcanoclastic siltstones and sandstones, capped by post-mineral Brouher rhyolite flows. Opaline sinter with strongly anomalous concentrations of Hg, As, and antimony (Sb) formed at the top of the Siebert Formation and was subsequently covered by Brouher flows. Stratigraphic correlation within the Siebert Formation is difficult as a result of very rapid facies changes and intense hydrothermal alteration. Detailed logging of core holes THC96-1 and 2 (80 feet apart) showed little correlation between either the fine-grained tuffaceous mudstones or the coarse-grained volcanoclastic sandstones and pebble conglomerates although there may be a general fining of clast size eastward. The high energy depositional environment indicated by the rhyolitic pebble conglomerates and quartz-biotite crystal tuffs with cross-bedding, contrasted with the quiescent environment for the mudstone deposition may indicate episodic phreatomagmatic eruptions caused by Oddie Rhyolite domes intruding into a lacustrine environment. The hydrothermal breccia on the east flank of South Hill is composed entirely of various Siebert Formation clasts, some of which show soft-sediment folding which is another indication of contemporaneous volcanism, tectonism, sedimentation, and mineralization. The series of north-south trending normal faults downdrop the Siebert

Formation to the east and are a primary control for disseminated mineralization in the Siebert Formation and the emplacement of the large hydrothermal breccia found on South Hill. The set of northwest trending faults appear to be normal, with the section being downdropped to the northeast. A major northwest trending fault separates North, South, and East Hills and appears to control the emplacement of the Oddie Rhyolite flow-dome on the west flank of South Hill. This northwest fault appears to have a spatial coincidence with high-grade gold mineralization found in the saddle between North and South Hill and with sporadic mineralization within the Fraction Tuff in the flats to the northwest and possibly to the southeast in the Birds Eye target area (Geological Society of Nevada [GSN] 1997).

#### 3.5.1.2 Regional Structure

North Hill and South Hill comprise a structural block which resembles a half-graben with a set of north-south trending, high-angle, easterly-dipping, normal faults (possibly listric normal) which consistently downdrop the section to the east. A less pronounced set of northwest-southeast trending normal faults cut North and South Hills and can be seen in long sections to downdrop to the northeast. On North Hill, the western bounding fault is commonly mineralized, has a normal displacement of approximately 100 feet and juxtaposes moderately silicified Fraction crystal lithic tuff breccia on the west against variably silicified and mineralized Siebert sediments on the east. On South Hill, the western bounding fault is occasionally mineralized, has a normal displacement of ten to 100 feet (decreasing southward) and separates an Oddie Rhyolite flowdome and propylitized Fraction Tuff Breccia on the west from silicified variably mineralized Siebert Formation epiclastics on the east. Additional north-south structures cut through the summits of North and South Hills and appear to have been the primary conduits for silicification and mineralization, as well as the South Hill hydrobreccia. The eastern bounding fault for the North-South Hill block is a distinctive north-south trending high angle structure, which can be traced from Slime Wash south to the draw between North and East Hills. It appears that several prominent east-west to west-northwest-east-southeast-trending curvilinear features that are present to the north side of Three Hills and are expressed by geologic breaks and linears in the geophysical data have cut and readjusted the north-south structural blocks. A series of subparallel structures lying north of North and East Hills appears to downdrop to the south along a normal fault. East-west geophysical linear features near the Sunrise Tonopah 76 claims are the apparent result of east-west trending structures and later intrusive bodies of West End Rhyolite and Oddie Rhyolite (GSN 1997).

#### 3.5.1.3 Project Alteration and Mineralization

Mineralization and alteration are intimately related in the Three Hills deposit. The core of the North-South Hill resource block is a zone of pervasive silicification and low-grade disseminated gold mineralization within a variable sequence of Siebert Formation crystal tuffs, volcanoclastic mudstones, siltstones sandstones and conglomerates, and the upper ten to 30 feet of the underlying Fraction Tuff. Statistical and metallurgical testing indicates evenly dispersed, very fine-grained (micron) gold particles within the deposit. From visual inspection and assay correlation, it appears that the gold was initially precipitated with fine-grained pyrite which is now completely oxidized to goethite/hematite/jarosite. The gold grades are generally very constant except where the grades are lower (0.008 ounce per ton) within the dense chalcedonic zones at the top of South Hill or near the Siebert-Fraction Tuff contact where the gold grades are consistently higher. This contact zone appears to have formed a favorable aquifer/aquitard for

mineralizing hydrothermal fluids and significant lateral mineralization has occurred away from the core zone to the south and east. The contact zone is not generally silicified but tends to be strongly argillized (GSN 2007).

The early phase hydrothermal fluids appear to have been relatively acidic and caused weak to strong argillization of the potassium feldspar (sanadine) crystals. As the solutions became more neutral and potassium rich, biotite, adularia, and quartz became the stable assemblage. For the bulk of the mineralization, this is expressed by cloudy adularized(?) feldspar crystals, bipyramidal quartz crystals, often with quartz overgrowths, occasional biotite flakes and a weakly-strongly silicified clay matrix. The top of South Hill is capped by ten to 60-foot zones of dense gray to brown chalcedony often with chalcedonic hydrobreccia veins and pipes. These chalcedony zones are very low in gold grade and appear to represent the top of the hydrothermal system and possibly the latest phase mineralizing fluid. Outward from the resource area the dominant alteration assemblage is the result of weak to strong argillization. Within strongly argillized Siebert tuffs, lithologies are difficult to differentiate when using RC drilling because after washing, only the bipyramidal quartz crystals remain. Outside the argillic zone, it is difficult to tell if the propylitic alteration in the Siebert and Fraction Tuff is related to the Three Hills hydrothermal system, a district scale alteration system or to deuteritic alteration (GSN 1997).

Trace element geochemical analysis was conducted on all rock samples collected and for 20-foot composites on all RC drilling. Mineralization is associated with weakly to moderately anomalous concentrations of Hg (80-900 parts per billion), As (50-200 parts per million [ppm]), Sb (two - ten ppm), molybdenum (20-100 ppm), and silver (Ag) (130 ppm) (GSN 1997).

#### 3.5.1.4 Faulting and Seismicity

The Walker Lane strike-slip faulting dominates the structural features and trends northwest, with offsets ranging from tens to several hundred feet. The strike-slip faulting resulted in the development of northeast and north-south trending extensional structures. These high angle features form a series of horst and graben landforms throughout the Project Area (MMCI 2014).

#### *Soil Site Classification*

The Soil Site Classification has been conservatively assumed to be class C, which indicates very dense soil and soft rock that corresponds to an average shear wave velocity of 1,200 to 2,500 feet per second in the upper 100 feet of the subsurface. The Seismic Design Category (SDC) was determined for the Project according to the 2012 International Building Code (IBC). The SDC is a classification assigned for a structure based on its occupancy or use and on the level of expected ground motion in the foundation materials.

#### *Seismic Design Parameters*

The Project site lies east of the central Nevada seismic belt and north of the southern Nevada seismic belt as identified by dePolo and dePolo (2012), which is characterized by a concentration of historic seismic events. To develop seismic design parameters for the Project, deterministic and probabilistic seismic hazard analyses were performed. Ground motions associated with design-level earthquakes were developed for the Project using both site-specific procedures and building codes. Based on a site-specific deterministic assessment of historic earthquakes and

faults sources, the critical event would be with a moment magnitude 6.8 event of the Lone Mountain fault zone at a distance of approximately 12 miles, which could produce a peak site acceleration of 0.28g. The adjusted peak acceleration based on the 2012 IBC and ASCE 7-10 code is 0.30g for a soil site class C. The Probabilistic Seismic Hazard Analysis acceleration for the 475-year and 2,475-year return events was estimated to be 0.14g and 0.28g, respectively (NewFields 2014).

Based on the presented data, the use of a peak ground acceleration (PGA) equal to 0.14g for operating conditions and a PGA equal to 0.28g for long-term and closure conditions is recommended for the Project (NewFields 2014).

### **3.5.2 Effects of the Proposed Action**

#### **3.5.2.1 Mineral Resources**

Under the Proposed Action, up to approximately 16 Mt of ore would be mined and processed using heap leach extraction methods, up to approximately 12 million tons of waste rock would be generated over the life of the Project, and up to approximately 570,000 ounces of gold would be recovered. The production of these minerals from the public land is consistent with federal laws and regulations on the use of the public lands.

Implementation of surface disturbing activities associated with the open pit, WRSAs, and HLF would affect approximately 276 acres within the Project Area. Impacts to geology and mineral resources would include the potential loss of access to future mineral resources as a result of the permanent placement of the proposed WRSAs and HLF. It is anticipated that these surface disturbances would have a minor effect on potential future access to remaining ore.

#### **3.5.2.2 Seismicity**

Potential seismic hazards for any site include ground rupture, slope instability, seismic induced settlement, and liquefaction or strain softening of subsurface deposits. Ground rupture is not expected to be a hazard for the HLF or associated facilities as seismic motions are not correlated to near-surface faulting. Liquefaction, which can occur within loose, saturated granular deposits, is not expected to be a hazard for the Project Area due to the depth to ground water and near surface deposits appear relatively dense (NewFields 2014). Similarly, potential liquefaction of saturated, deep deposits would not influence structures in regards to seismic settlement as surface evidence of liquefaction is typically associated with depths less than about 45 feet below ground surface (Idriss and Boulanger 2008).

#### **3.5.2.3 Pit Slope Stability**

The preliminary pit has a pit bottom elevation of 5,440 feet and maximum pit crest elevation of approximately 5,900 feet, resulting in maximum slope heights of approximately 460 feet. The West pit sector is designed to develop slopes up to approximately 100 feet high in the Oddie Rhyolite, and the East sector pit slope would develop slopes up to perhaps 40 feet high in the Brougner Dacite Flow. The remaining pit slopes would be developed largely within Siebert Formation, with the exception of the pit bottom and West sector slope that would be up to 400 feet high and would be developed in Fraction Tuff.

Pits would be developed with 20-foot high production benches. Development of moderately steep slope angles feasible for small to moderate slope heights would best be accomplished by double benching to enable development of effective catch benches at 40-foot vertical intervals, since the Siebert Formation generally has sufficient strength to stand in benches of this height. Pit slope design of the Three Hills pit is provided in Table 3.5-1.

**Table 3.5-1: Preliminary Pit Slope Design Recommendations**

Geotechnical Unit	Catch Bench Separation (feet)	Bench Face Angle (degrees)	Catch Bench Width (feet)	Inter-Ramp Angle (degrees)	Maximum Slope Height Without Ramp or 65-foot Wide Geotechnical Bench
Siebert Formation	40	60	25	40	200
Siebert Formation	40	60	35	35	120
Fraction Tuff	40	70	25	45	200
Brougher Dacite Flow	40	70	25	45	200
Oddie Rhyolite	40	70	25	45	200

Available data indicate rock quality and strength should be favorable for planned inter-ramp slope angles (Golder 2014).

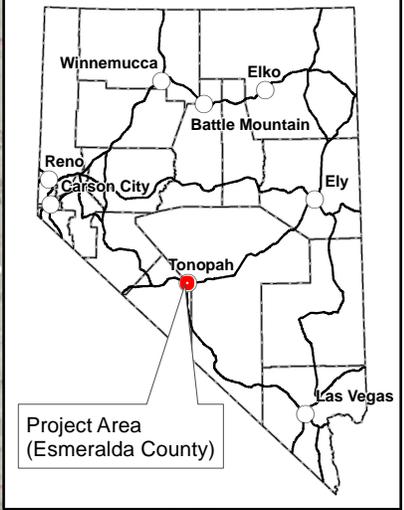
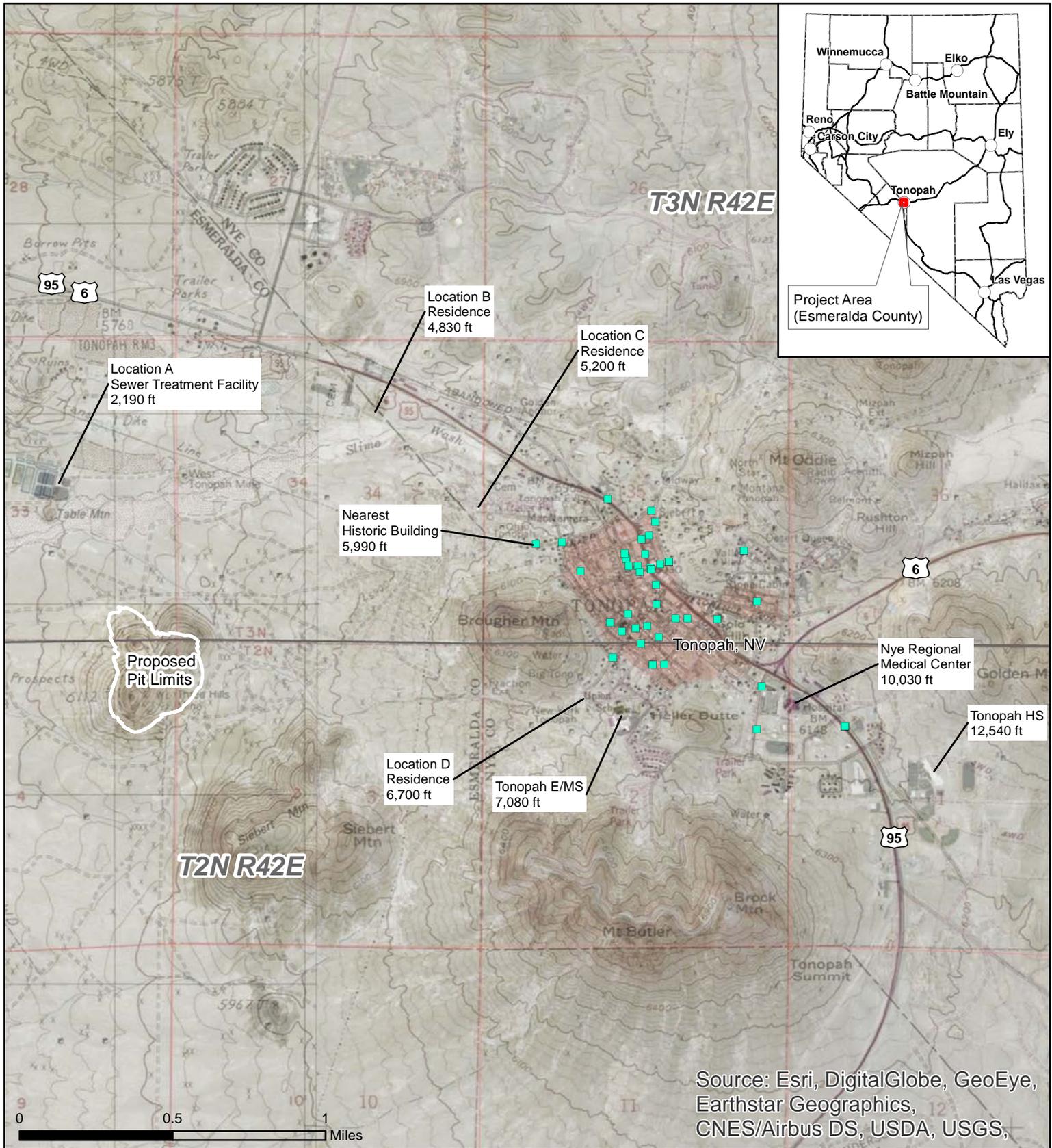
#### 3.5.2.4 Blasting Vibration

When blasting occurs at mining operations, explosives are detonated with the intent to break rock so that it can be easily excavated by loaders or shovels. Beyond the fracture zone, there is a shock wave generated by blasting that can travel through soils, rock, and air. The shock wave that continues to travel through soil and rock is observed as blast vibration. The shock waves that sometime continue through air are observed as air blast or air overpressure.

Blast vibration is measured using peak partical velocity (PPV) and the PPV can be measured by monitoring the blast with specialized equipment. When designing a blast at a mining operation the PPV can be estimated using common scaled distance equations. Air overpressure is measured using peak air overpressure (PAO). The PAO is generally measured in pounds per square inch (psi). However, it is often convenient to convert the number to decibel units (dB). The amount of PAO from a blast can be controlled by confining the blast.

#### *Estimating PPV and PAO*

PPV and PAO values for the Project were modeled at four locations (Figure 3.5.1). Modeled values for PPV and PAO are shown in Table 3.5-2. These locations were selected to determine the values near the sewage treatment ponds to the northwest of the pit, and Town of Tonopah residences to the northeast and east of the pit. The distances were taken from these locations to the nearest pit crest, so these are the closest distances possible. Note that since these values were



**Explanation**

- Building (National Registry of Historic Places)



BATTLE MOUNTAIN DISTRICT OFFICE  
 Tonopah Field Office  
 1553 South Main Street  
 Tonopah, Nevada 89049



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**BUREAU OF LAND MANAGEMENT**

**THREE HILLS MINE PROJECT**

**Blast Vibration Locations Map**

Figure 3.5.1

10/07/2015

estimated from the nearest pit crest they represent the PPV and PAO at elevations higher than the surrounding topography. As such, one would expect the PAO to be greatest during blasting at the top of the hill, with reduced values once mining establishes a crest around the perimeter of the pit when the pit wall would act like a barrier against direct release of air overpressure.

In contrast, the PPV requires a rock mass to propagate vibrations, so it would be lower while blasting on top of the hill as there would be no direct line through the rock mass.

**Table 3.5-2: Estimated Blast Vibration and Air Overpressure at Modeled Locations**

Modeled Point	Description	Distance (feet)	PPV	Psi	dB
A	Sewer Treatment Facility	2,190	0.27	0.004097	123
B	Residence	4,830	0.08	0.001454	114
C	Residence	5,200	0.07	0.001454	114
D	Residence	6,700	0.05	0.001029	111

Source: MDA 2014; revised 2015

### *Evaluation Criteria*

Evaluation criteria that compare both PPV and PAO levels to potential damage effects have been developed by the US Bureau of Mines (USBM), as well as others. Table 3.5-3 shows evaluation criteria that are provided from various reference sources (Bender 2006 from MDA 2014). Using these criteria with the PPV estimations for the selected modeled locations (Table 3.5-2), it would be expected that some movement at the corners of the HLP closest to the pit would be felt at a level equivalent to walking or jumping on a floor. For the structures in Town of Tonopah, these effects should be in the barely perceptible range.

**Table 3.5-3: Blast Damage Criteria**

PPV (in/sec)	Application	Effect <sup>1</sup>
1.2 – 3.0	Residential Structure	Equals stress from daily environmental changes
2.8	Residential Structure	No damage
2.0	Residential Structure	Plaster can start to crack
2.0	Plaster	Safe level of vibration
<2.0	Residential Structure	No damage
<2.0	Residential Structure	No damage
0.9	Residential Structure	Equivalent to nail driving
0.5	Mercury Switch	Trips switch
0.5	Residential Structure	Equivalent to door slam
0.1 – 0.3	Residential Structure	Equates to normal daily family activity
0.3	Residential Structure	Equivalent to jumping on the floor
0.03	Residential Structure	Equivalent to walking on the floor

<sup>1</sup> – The effects are taken from multiple references and compiled by Bender 2006.

Table 3.5-4 shows air overpressure and perception criteria. Based on these criteria and the estimated values in Table 3.5-2, the air overpressure would be perceptible in the area around the mine site and near the western edge of the Town of Tonopah, but not to the extent of causing any damage. The air blast is estimated to be in the "Strongly perceptible" to "Mildly unpleasant" Average Human Response categories; therefore, it could be considered an annoyance by some individuals.

**Table 3.5-4: Blast Evaluation Criteria**

Air Overpressure		Probable Result	Average Human Response
dB	psi		
180	2.9	Structural damage	Eardrum rupture possible
175	1.631		
170	0.917	Many windows break	Intolerable
165	0.516		
160	0.29		
155	0.163	Equal to 96 mph wind gust	
150	0.092	Poorly mounted windows can break	
145	0.052		
140	0.029	Equal to a 40 mph wind gust	Distinctly unpleasant
135	0.0145		
130	0.0092	Equal to a 23 mph wind gust	
125	0.0052		
120	0.0029		Mildly unpleasant
115	0.0016		
110	0.00092	Equal to a 7.2 mph wind gust	
105	0.00052		
100	0.00029		
95	0.00016		
90	0.000092		Strongly perceptible
85	0.000052		
80	0.000029		
75	0.000016		
70	0.0000092		Distinctly perceptible
65	0.0000052		
60	0.0000029		Perceptible

### 3.5.3 Effects of the Powerline Alternative

Under the Powerline Alternative the mining operations and the blasting activities would be the same as under the Proposed Action. This alternative would recover up to approximately 570,000 ounces of gold, have PPV that would be in the barely perceptible range in the Town of

Tonopah, and a PAO in the strongly perceptible to mildly unpleasant range in the Town of Tonopah.

### **3.5.4 Effects of the On-Site Water Alternative**

Under the On-Site Water Alternative the mining operations and the blasting activities would be the same as under the Proposed Action. This alternative would recover up to approximately 570,000 ounces of gold, have PPV that would be in the barely perceptible range in the Town of Tonopah, and a PAO in the strongly perceptible to mildly unpleasant range in the Town of Tonopah.

### **3.5.5 Effects of the Knapp Avenue Access Only**

Under the Knapp Avenue Access Only Alternative the mining operations and the blasting activities would be the same as under the Proposed Action. This alternative would recover up to approximately 570,000 ounces of gold, have PPV that would be in the barely perceptible range in the Town of Tonopah, and a PAO in the strongly perceptible to mildly unpleasant range in the Town of Tonopah.

### **3.5.6 Effects of the No Action Alternative**

Under the No Action Alternative none of the mining operations and blasting activities would occur. Under this alternative the approximately 570,000 ounces of gold would not be produced. In addition, the PPV and PAO effects for the blasting would not occur.

## **3.6 Lands and Realty**

### **3.6.1 Affected Environment**

The Project Area is located on public land administered by the TFO, and private lands. Figure 1.1.1 shows the Project Area location and land status. The current land uses in the Project Area and vicinity consist primarily of mineral exploration, wildlife habitat, and recreational use. There are portions of four BLM-authorized ROWs within the Project Area: a Sierra Pacific transmission line (N-43264) located in Section 3, T2N, R42E; a power transmission line (N-52704) located in Section 3, T2N, R42E; a fiber optic cable (N-73706) located in Section 4, T2N, R42E; and Esmeralda County Road 198, or Paymaster Canyon Road (N-92355), located in Sections 3 and 4, T2N, R42E. There is a road claimed by Esmeralda County north of the mine in Sections 33 and 34, T3N, R42E, and Section 4, T2N, R42E.

### **3.6.2 Effects of the Proposed Action**

Under the Proposed Action the fenced portion of the Project Area would restrict access to approximately 480 acres, which includes essentially the entire Project surface disturbance, for the duration of the Project. The Proposed Action would also result in the relocation of a portion of the existing fiber optic cable (Figure 2.1.1). The ROWs associated with Paymaster Canyon Road, the powerline, and the Sierra Pacific transmission line would not be affected by the Proposed Action. The Project fence would block access on a portion of the road claimed by Esmeralda County that runs east-west to the north of the mine for the duration of the Project. The

Proposed Action would establish a bypass route around the Project fence so that public use of the road beyond the Project Area could continue. In addition, the Proposed Action would result in the use of public land as part of the access for the Project (South Access Road), which is an existing road. The use of this road would be generally compatible with other land uses (see Section 3.2.13 for potential recreational use conflicts).

### **3.6.3 Effects of the Powerline Alternative**

Under the Powerline Alternative, the Project operations would be similar to the Proposed Action, except the use of public lands would be slightly greater due to construction and operation of the powerline to the Project. However, the Powerline Alternative would not result in lands and realty impacts greater than those of the Proposed Action.

### **3.6.4 Effects of the On-Site Water Alternative**

Under the On-Site Water Alternative, impacts to lands and realty would be somewhat less than under the Proposed Action since the use of the water pipeline connecting the Project with the Town of Tonopah water system would not be constructed.

### **3.6.5 Effects of the Knapp Avenue Access Only Alternative**

Under the Knapp Avenue Access Only Alternative, impacts to lands and realty would be essentially the same as under the Proposed Action.

### **3.6.6 Effects of the No Action Alternative**

Under the No Action Alternative, lands and realty impacts associated with the Project would not occur. WKM would not be authorized to develop the Project and mine the ore body as described in the Proposed Action. However, the currently authorized exploration in the Project Area could continue, which would result in the temporary use of roads.

## **3.7 Migratory Birds**

### **3.7.1 Affected Environment**

"Migratory bird" means any bird listed in 50 CFR 10.13. All native birds commonly found in the US, with the exception of resident game birds, are protected under the Migratory Bird Treaty Act of 1918 (MBTA). The MBTA prohibits taking of migratory birds, their parts, nests, eggs, and nestlings. EO 13186, signed January 10, 2001, directs federal agencies to protect migratory birds by integrating bird conservation principles, measures, and practices.

Additional direction comes from a MOU between the BLM and US Fish and Wildlife Service (USFWS), signed January 17, 2010. The purpose of this MOU is to strengthen migratory bird conservation through enhanced collaboration between the BLM and USFWS, in coordination with state, tribal, and local governments. The MOU identifies management practices that impact populations of high priority migratory bird species, including nesting, migration, or overwintering habitats, on public lands, and develops management objectives or recommendations that avoid or minimize these impacts.

Baseline wildlife surveys, including a migratory bird and raptor survey, were conducted by Wildlife Resource Consultants (WRC) for Enviroscientists on July 5 through July 11, 2014, within and surrounding the Project Area (Enviroscientists 2014). Table 3.7-1 lists all migratory bird species observed within and surrounding the Project Area during the surveys.

**Table 3.7-1: Migratory Bird Species Detected in the Project Area**

Common Name	Scientific Name
Black-throated sparrow	<i>Amphispiza bilineata</i>
Common raven	<i>Corvus corax</i>
Lesser goldfinch	<i>Carduelis psaltria</i>
Great horned owl	<i>Bubo virginianus</i>
Horned lark	<i>Eremophila alpestris</i>
Prairie falcon	<i>Falco mexicanus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Rock wren	<i>Columba livia</i>
Unidentified swallow	Family <i>Hirundinidae</i>
Western kingbird	<i>Tyrannus verticalis</i>

Source: Enviroscientists 2014

In addition, the NDOW, Nevada Natural Heritage Program (NNHP), and the USFWS were contacted to request information regarding wildlife use and nesting raptors in the area. In a response letter provided on June 5, 2014, for the proposed Project, the NDOW identified the following additional migratory birds as being known to reside in the vicinity (four-mile buffer) of the Project Area: American kestrel (*Falco sparverius*); bald eagle (*Haliaeetus leucocephalus*); barn owl (*Tyto alba*); burrowing owl (*Athene cunicularia*); Cooper’s hawk (*Accipiter cooperii*); ferruginous hawk (*Buteo regalis*); golden eagle (*Aquila chrysaetos*); long-eared owl (*Asio otus*); merlin (*Falco columbarius*); northern goshawk (*Accipiter gentilis*); northern harrier (*Circus cyaneus*); northern saw-whet owl (*Aegolius acadicus*); osprey (*Pandion haliaetus*); peregrine falcon (*Falco peregrinus*); rough-legged hawk (*Buteo lagopus*); sharp-shinned hawk (*Accipiter striatus*); Swainson’s hawk (*Buteo swainsoni*); turkey vulture (*Cathartes aura*); and western screech-owl (*Megascops kennicottii*) (NDOW 2014). The NDOW stated that California condor (*Gymnogyps californianus*), great horned owl, merlin, prairie falcon, and red-tailed hawk have been directly observed in the vicinity of the Project Area. The NDOW has identified the bald eagle, burrowing owl, ferruginous hawk, golden eagle, northern goshawk, peregrine falcon, prairie falcon, and red-tailed hawk as NDOW species of special concern and are target species for conservation. One occupied red-tailed hawk and one unoccupied red-tailed hawk nest were identified during 2013 aerial surveys within one mile of the Project Area (JBR 2013). One occupied red-tailed hawk nest was identified during 2014 aerial surveys within one mile of the Project Area (Enviroscientists 2014). A ground raptor survey was conducted approximately 45 days after the 2014 aerial surveys to update the nest status. The following three raptor species were directly observed within and surrounding the Project Area during the ground survey: great horned owl; prairie falcon; and red-tailed hawk.

A great horned owl was observed roosting in one of the wood and tin-roofed buildings at the Lambertucci-Roma Ranch on July 6, 2014. No evidence of great horned owl nesting was

observed (e.g., molted feathers, pellets, prey remains, egg shells). A great horned owl flight feather was recorded north of the Project Area on July 6, 2014.

Prairie falcons were observed on three different days (July 6, 8, and 10, 2014) southeast of the Project Area near Siebert Mountain. The prairie falcon was soaring and sometimes vocalizing.

On almost all wildlife survey days, red-tailed hawks were observed soaring over the mountainous portions within and in the vicinity of the Project Area, including Brougher Mountain, Siebert Mountain, and the Three Hills Mine. At approximately 10:00 a.m. on July 9, 2014, a red-tailed hawk was observed perched on a wooden power pole southeast of the Project Area. The red-tailed hawk observations typically occurred early in the morning and at dusk, including after sunset. During the middle of the day, few birds were observed within and surrounding the Project Area.

Migratory bird species identified for additional protection or management attention are discussed in detail in Section 3.17, Special Status Species. No BLM sensitive species were detected within and surrounding the Project Area; however, golden eagle nests were detected within ten miles of the Project Area during helicopter surveys.

### **3.7.2 Effects of the Proposed Action**

Impacts to migratory birds with suitable habitat in the Project Area would consist of habitat loss and disturbance from human activity and noise. Vegetation removal associated with surface disturbing activities would result in a reduction of approximately 459 acres of foraging and breeding habitat for migratory birds and foraging habitat for raptors within the Project Area. This acreage would not be disturbed all at one time due to the phased nature of the mining activities associated with the Project. Continuous mining activity in the open pit would likely be sufficient to prevent most or all nesting, perching, and roosting attempts by migratory birds during Project operations. All surface disturbance would be temporary and reclaimed, with the exception of the open pit, which would create additional breeding and nesting habitat for raptors, but would result in a long-term loss of foraging and breeding habitat for migratory birds and foraging habitat for raptors. As outlined in the ACEPM in Section 2.1.11, WKM and AT&T have committed to providing a qualified biologist to conduct nest surveys prior to any surface disturbing activities during the avian breeding season. This measure would ensure that no direct impacts to migratory birds are likely to occur under the Proposed Action. In addition, measures have been included in the BBCS prepared for the Project (Appendix A) that would minimize effects to birds, such as fencing of cyanide-containing ponds, monitoring to ensure ponding does not occur on top of the heap leach pad, and netting of any open ditches containing process solution flows. Indirect impacts such as vegetation removal could lead to temporary spatial redistribution of individuals or habitat-use patterns during the life of the Project. It is unlikely that implementing the Proposed Action would result in a decline in local or regional migratory bird populations because birds would be able to redistribute. Also undisturbed and suitable habitat exists outside of the Project Area.

### **3.7.3 Effects of the Powerline Alternative**

Under the Powerline Alternative, development and operation of the Project would remove or disturb approximately 539 acres of migratory bird foraging and breeding habitat, of which 75 acres associated with the open pit would not be reclaimed, and could potentially provide

additional nesting habitat for raptors. Similar to the Proposed Action, the ACEPMs and reclamation would minimize this alternative's effect on migratory birds. However, impacts to migratory birds under the Powerline Alternative would be more than the Proposed Action (approximately 544 acres of temporary nesting and foraging habitat loss versus approximately 384 acres associated with the Proposed Action). In addition, under the Powerline Alternative, an approximately 2.4-mile long powerline would be constructed, which would add perching opportunities for migratory birds.

### **3.7.4 Effects of the On-Site Water Alternative**

Under the On-Site Water Alternative, development and operation of the Project would remove or disturb approximately 453 acres of migratory bird foraging and breeding habitat, of which 75 acres associated with the open pit would not be reclaimed, and would create additional breeding and nesting habitat for raptors. Similar to the Proposed Action, the ACEPMs and reclamation would minimize this alternative's effect on migratory birds. Impacts to migratory birds under the On-Site Water Alternative would be similar, but less than the Proposed Action (approximately 378 acres of temporary nesting and foraging habitat loss versus approximately 384 acres associated with the Proposed Action).

### **3.7.5 Effects of the Knapp Avenue Access Only Alternative**

Under the Knapp Avenue Access Only Alternative, development and operation of the Project would remove or disturb approximately 458 acres of migratory bird foraging and breeding habitat, of which 75 acres associated with the open pit would not be reclaimed, and would create additional breeding and nesting habitat for raptors. Similar to the Proposed Action, the ACEPMs and reclamation would minimize this alternative's effect on migratory birds. Impacts to migratory birds under the Knapp Avenue Access Only Alternative would be similar to impacts associated with the Proposed Action (approximately 383 acres of temporary nesting and foraging habitat loss versus approximately 384 acres associated with the Proposed Action).

### **3.7.6 Effects of the No Action Alternative**

Under the No Action Alternative, up to five acres of surface disturbance could occur within the Project Area under Notice-level exploration activities. This could result in the temporary loss of approximately five acres of migratory bird nesting or foraging habitat. Reclamation of surface disturbance would gradually eliminate potential impacts to migratory birds. Impacts to migratory birds under the No Action Alternative would be similar, but proportionally less than the Proposed Action (approximately five acres of temporary nesting and foraging habitat loss versus approximately 384 acres associated with the Proposed Action).

## **3.8 Native American Concerns**

### **3.8.1 Affected Environment**

Located within the traditional territory of the Western Shoshone, the TFO administrative boundary contains spiritual, traditional, and cultural resources, and sites to engage in social practices that aid in maintaining and strengthening the social, cultural, and spiritual integrity of the Tribes. Recognized Tribes with known interests near the Project Area include the Timbisha

Shoshone Tribe, the Yomba Shoshone Tribe, and the Duckwater Shoshone Tribe. In addition, various other community members and individuals are known to have interests in the general area of the San Antonio Mountains.

Social activities of Native Americans continue to define places of cultural importance across lands currently administered by the BLM. Some Western Shoshone maintain cultural, spiritual, and traditional activities, visit their sacred sites, hunt game, and gather available medicinal and edible plants. Through oral history (the practice of handing down knowledge from the elders to the younger generations), some Western Shoshone continue to maintain a world view similar to that of their ancestors.

Cultural, traditional, and spiritual sites and activities of importance to Tribes include, but are not limited to the following:

- Existing animal traps;
- Certain mountain tops used for vision questing and prayer;
- Medicinal and edible plant gathering locations;
- Prehistoric and historic village sites and gravesites;
- Sites associated with creation stories;
- Hot and cold springs;
- Collection of materials used for basketry and cradle board making;
- Locations of stone tools such as points and grinding stones (mano and matate);
- Chert and obsidian quarries;
- Hunting sites;
- Sweat lodge locations;
- Locations of pine nut ceremonies, traditional gathering, and camping;
- Rock collecting for use in offerings and medicine gathering;
- Tribally identified Traditional Cultural Properties (TCPs);
- TCPs found eligible to the NRHP;
- Rock shelters;
- Lands or resources that are near, within, or bordering current reservation boundaries; and
- Actions that conflict with tribal land acquisition efforts.

In accordance with the NHPA, the NEPA, the FLPMA (P.L. 94-579), the American Indian Religious Freedom Act of 1978 (P.L. 95-341), the NAGPRA (P.L. 101-601) and EO 13007, the BLM must provide affected Tribes an opportunity to comment and consult on the proposed Project. NHPA allows that “properties of traditional, religious, and cultural importance to an Indian tribe or Native Hawaiian organization may be determined eligible for inclusion on the NRHP.” Section 106 of NHPA requires federal agencies to take into account the effects to historic properties (including those with religious, traditional, or cultural significance) posed by federal undertakings. In addition, under NAGPRA, culturally affiliated Indian tribes and the BLM jointly may develop procedures to be undertaken when Native American human remains are discovered on federal lands. The BLM must attempt to limit, reduce, or possibly eliminate any negative impacts to Native American traditional/cultural/spiritual sites, activities, and resources. Standard regulations for implementing Section 106 of NHPA are outlined in 36 CFR 800.

On November 14, 2014, consultation initiation/invitation letters were mailed for the Project from the BLM BMD Office to the following: the Timbisha Shoshone Tribe; the Yomba Shoshone Tribe; and the Duckwater Shoshone Tribe. The BMD Native American Coordinator spoke to the Duckwater Shoshone Tribe on December 3, 2014, the Timbisha Shoshone Tribe on May 12, 2015, and the Yomba Shoshone Tribe on June 1, 2015, and all Tribes indicated, either through written correspondence or verbally to the BMD Native American Coordinator, they had no concerns with the Project.

### **3.8.2 Effects of the Proposed Action**

Various Tribes and Bands of the Western Shoshone have stated federal projects and land actions that might have widespread effects to their culture and religion as they consider the landscape as sacred and as a provider. Various locations throughout the TFO administrative area host certain traditional, spiritual, and cultural use activities today, as in the past. TCPs, designated by the Tribes, are not known to exist in or within the vicinity of the Project Area. The TFO continues to solicit input from local tribal entities. The TFO is continuing to coordinate with the Tribes to identify any other sites or artifacts, or cultural, traditional, and spiritual use resources and activities that might experience an impact.

If any TCPs, tribal resources, sacred sites, etc. are identified within or in close proximity to the Project boundary, a protective “buffer zone” may be acceptable, if doing so satisfies the needs of the BLM, the proponent, and affected Tribe. The size of any “buffer zone” would be determined through coordination and communication between all participating entities.

The BLM Cultural Resource Specialist, accompanied by designated tribal observers, may periodically visit identified cultural resources sites within or near the Project Area. Native American Consultation and monitoring by the BLM and Tribal Representatives may occur throughout the life of a project to ensure that any identified TCPs are not deteriorating.

If a subsequent development plan or amendment to the Plan is submitted to the BLM as a result of an approval of this specific mining proposal, the BLM would again initiate consultation with the local Tribes and utilize any data collected during this mining proposal.

During the Project's activities, if any cultural properties, items, or artifacts (i.e., stone tools, projectile points, etc.) are encountered, it must be stressed to those involved in the proposed Project activities that such items are not to be collected. The ACEPM in Section 2.1.11 states all activities would be halted immediately in the event of a discovery of a cultural resource. Cultural and archaeological resources are protected under the Archaeological Resources Protection Act (16 US Code 470ii) and the FLPMA.

Though the possibility of disturbing Native American gravesites within most project areas is extremely low, inadvertent discovery procedures must be noted. Under the NAGPRA, Section (3)(d)(1), the discovering individual must notify the authorized officer in writing of such a discovery. If the discovery occurs in connection with an authorized use, the activity, which caused the discovery, is to cease and the materials are to be protected until the land manager can respond to the situation.

At this time, no impacts related to Native American Concerns have been identified and are not anticipated from the Proposed Action. Therefore, this resource is not carried forward in additional analysis. However, tribal relations and coordination do not terminate with the land use decision itself, but rather continues to engage Tribes regarding treatments, mitigation, reclamation, and disposition of artifacts and deports.

### **3.8.3 Effects of the Powerline Alternative**

At this time, no impacts related to Native American Concerns have been identified and are not anticipated from the Powerline Alternative. Tribal relations and coordination do not terminate with the land use decision itself, but rather continues to engage Tribes regarding treatments, mitigation, reclamation, and disposition of artifacts and deports.

### **3.8.4 Effects of the On-Site Water Alternative**

At this time, no impacts related to Native American Concerns have been identified and are not anticipated from the On-Site Water Alternative. Tribal relations and coordination do not terminate with the land use decision itself, but rather continues to engage Tribes regarding treatments, mitigation, reclamation, and disposition of artifacts and deports.

### **3.8.5 Effects of the Knapp Avenue Access Only Alternative**

At this time, no impacts related to Native American Concerns have been identified and are not anticipated from the Knapp Avenue Access Only Alternative. Tribal relations and coordination do not terminate with the land use decision itself, but rather continues to engage Tribes regarding treatments, mitigation, reclamation, and disposition of artifacts and deports.

### **3.8.6 Effects of the No Action Alternative**

At this time, no impacts related to Native American Concerns have been identified and are not anticipated from the No Action Alternative. Tribal relations and coordination do not terminate with the land use decision itself, but rather continues to engage Tribes regarding treatments, mitigation, reclamation, and disposition of artifacts and deports.

## **3.9 Noise**

### **3.9.1 Federal Noise Standards**

The BLM has jurisdiction over a portion of the land within the Project Area. The BLM does not utilize specific noise level standards but historically has referred to guidelines contained within the EPA document entitled “Information on Levels of Environmental Noise Requisite to Protect the Public Health and Welfare with an Adequate Margin of Safety” (EPA 1974).

One of the purposes of the 1974 EPA Levels Document was to provide information for use by state and local governments in developing their own noise standards. It was intended such information be utilized along with other factors such as the balance between costs and benefits when establishing noise level standards. The 1974 EPA Levels Document identified an exterior noise exposure of 55 dB Day/Night Average Sound Level (DNL) and an interior noise exposure

of 45 dB DNL as sufficient to prevent activity interference and annoyance. Such recommendations, however, do not take into account the balance between cost and benefit.

Other federal standards that could be considered applicable to the Project include the US Department of Housing and Urban Development (HUD) standards. The HUD standards are the same as those commonly utilized by many state and local jurisdictions, with an exterior noise standard of 65 dB DNL and an interior standard of 45 dB DNL. The HUD standards come into play when federal funds may be used for housing development projects.

### 3.9.2 Substantial Noise Increases

Neither the BLM nor EPA Levels Document defines what constitutes a substantial increase in noise levels. Some guidance is provided by the 1992 findings of the Federal Interagency Committee on Noise (FICON), which assessed changes in ambient noise levels resulting from transportation noise sources. The FICON recommendations are based on studies that relate aircraft and traffic noise levels to the percentage of persons highly annoyed by the noise. The rationale for the FICON recommendations is that it is possible to consistently describe the annoyance of people exposed to transportation noise in terms of the DNL. Annoyance is a summary measure of the general adverse reaction of people to noise resulting in speech interference, sleep disturbance, or interference with other daily activities.

Although the FICON recommendations were specifically developed to address transportation noise impacts, the recommendations are used in this analysis for all noise sources described in terms of cumulative noise exposure metrics such as the DNL. Table 3.9-1 summarizes the FICON recommendations.

**Table 3.9-1: Measures of Substantial Noise Increase for Transportation Sources**

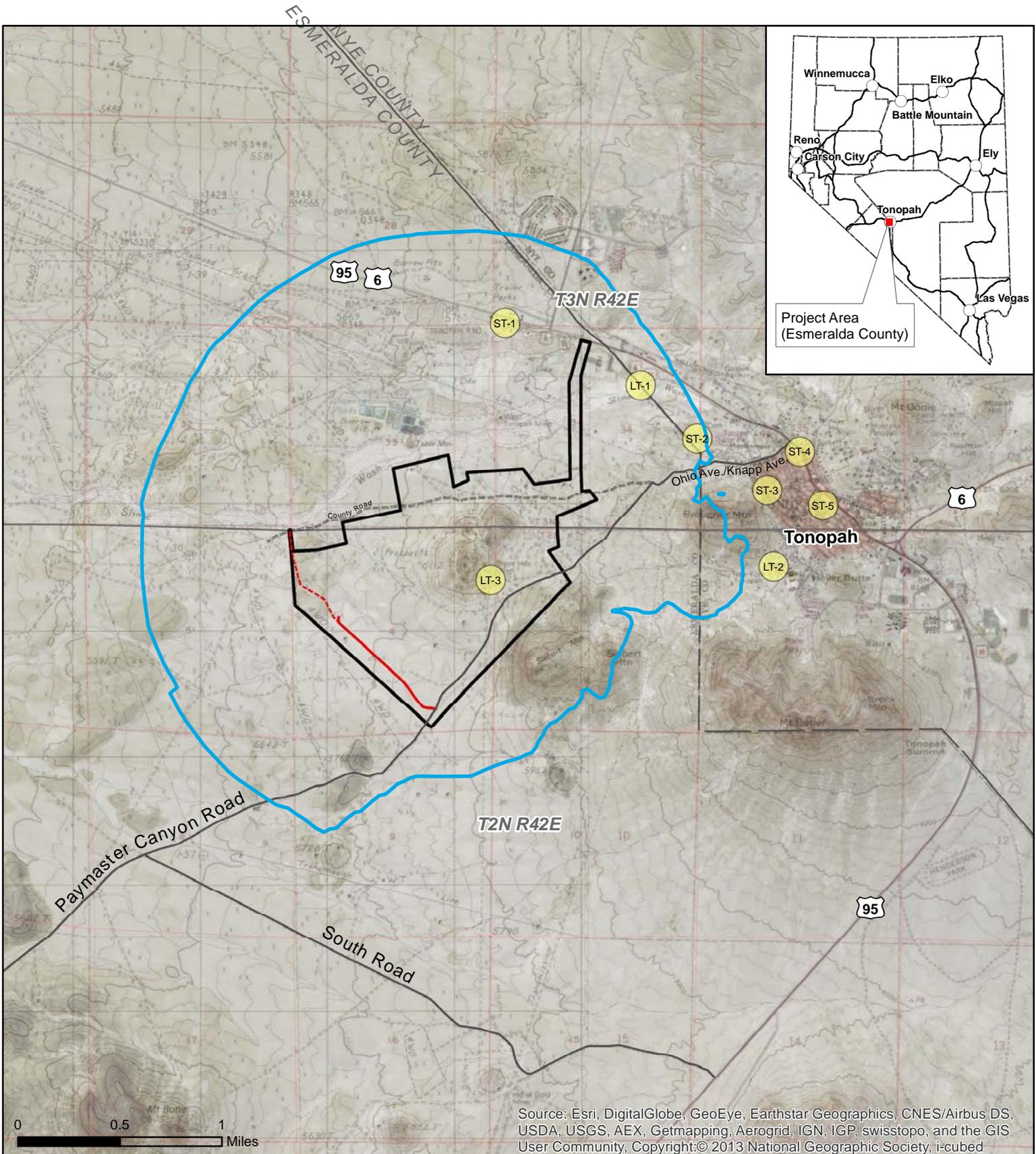
Ambient Noise Level without Project (DNL)	Significant Impact Assumed to Occur if the Project Increases Ambient Noise Levels by:
<60 dB	+5 dB or more
60 - 65 dB	+3 dB or more
>60 dB	+1.5 dB or more

Source: FICON 1992

### 3.9.3 Affected Environment

Major noise sources in the Project Area include traffic on local roadways, occasional aircraft overflights, off-road vehicles and existing commercial/industrial operations. Within the Project vicinity (outside of the Town of Tonopah) ambient noise levels are generally low.

Long-term (24-hour) ambient noise level measurements were conducted at three locations within the Project Area and the nearby Town of Tonopah. Additionally, short-term (15-minute) ambient noise level measurements were conducted at five locations. Noise monitoring sites were selected to represent typical acoustic settings within the Project vicinity in order to document existing noise levels. Ambient noise monitoring was conducted on January 16, 2015. Noise monitoring sites are shown in Figure 3.9.1. Long-term sites are shown as LT-1 through LT-3 and short-term sites are shown as ST-1 through ST-5.



0 0.5 1 Miles

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Copyright:© 2013 National Geographic Society, i-cubed

**Explanation**

- Project Area
- Noise Monitoring Sites
- Existing Access Routes
- County Road
- Proposed Project Access Road
- Proposed County Road Bypass
- 40 dB Noise Contour



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**BUREAU OF LAND MANAGEMENT**

**THREE HILLS MINE PROJECT**

**Noise Monitoring Sites Map**

Figure 3.9.1

10/07/2015

Noise monitoring equipment consisted of Larson-Davis Laboratories Model LDL 820 sound level analyzers equipped with Bruel & Kjaer (B&K) Type 4176 ½" microphones. Microphones were located on tripods at approximately five feet above the ground and were equipped with random incidence correctors so that noise levels from sources in all directions could be accurately measured. The monitors were calibrated with a B&K Type 4230 acoustical calibrator to ensure the accuracy of the measurements. The equipment complies with applicable specifications of the American National Standards Institute (ANSI) for Type 1 sound measurement systems.

Table 3.9-2 summarizes ambient noise monitoring results at the long-term (24-hour) measurement sites. The noise monitoring points are shown on Figure 3.9.1. Noise measurement data are described in terms of the equivalent energy ( $L_{eq}$ ), maximum ( $L_{max}$ ) and  $L_{90}$  noise level descriptors. The  $L_{eq}$  and  $L_{max}$  describe energy average and maximum noise levels measured during each hour of the sample periods, respectively. The  $L_{90}$  describes the noise level exceeded 90 percent of the time during each hour, which is generally considered to represent the residual (or background) noise level in the absence of identifiable single noise events from traffic, aircraft and other local noise sources. The measured DNL for each long-term ambient noise monitoring site is also included in Table 3.9-2. Measured DNL values ranged from 42.8-53.8 dB.

**Table 3.9-2: Measured Ambient Noise Levels, Long-Term (24-Hour) Measurement Sites**

Measurement Site	Range of Hourly Noise Levels, dB			DNL, dB
	$L_{eq}$	$L_{max}$	$L_{90}$	
LT-1	35.7 – 45.4	48.0 – 62.5	23.4 – 38.3	47.1
LT-2	27.5 – 63.8	40.9 – 90.9	23.3 – 32.7	53.8
LT-3	22.8 – 51.3	36.5 – 79.3	15.9 – 25.5	42.8

Source: Brown-Buntin Associates, Inc. 2015

Since an observer was not present for the entire 24-hour noise monitoring periods, it is not possible to know specifically what sources of noise may have generated the highest measured noise levels at the long-term noise monitoring sites. Since hourly  $L_{eq}$  values represent energy average noise levels, they can be significantly affected by occasional noise events in the vicinity of the monitoring site. Sites LT-1 and LT-2 were located within the Town of Tonopah. Site LT-3 was located adjacent to the Project, away from typical sources of noise associated with an urban environment. Noise levels at site LT-2 exhibited some fairly high maximum noise levels during a couple of the measurement hours, subsequently resulting in elevated  $L_{eq}$  levels during the same hours. Based upon tire tracks and observed activity in the general area, these levels were likely produced by off-road vehicles or motorcycles near the microphone.

Short-term noise measurements were conducted for 15-minute periods at five sites in the Project vicinity. Noise measurements were conducted at two separate times at each location, once in the morning hours and once in the afternoon hours. Table 3.9-3 summarizes short-term noise measurement results.

### 3.9.4 Effects of the Proposed Action

Project-related noise levels were calculated using the SoundPLAN noise model (Brown-Buntin 2015). The Project would utilize several pieces of equipment that would generate

noise. The Project would operate 24-hours per day. Although every piece of proposed equipment would not necessarily be operating simultaneously, for the purpose of this analysis, Project-related noise levels were modeled assuming all equipment was operated simultaneously. This represents the maximum extent of Project-related noise levels.

**Table 3.9-3: Measured Ambient Noise Levels, Short-Term (15-Minute) Measurement Sites**

Location	Time	$L_{eq}$	$L_{max}$	$L_{90}$	Noise Sources
ST-1	8:30 am	49.5	63.3	30.4	US Highway 95 traffic
ST-1	3:20 pm	46.9	60.6	28.8	
ST-2	8:55 pm	37.5	53.7	31.6	Local and distant traffic, wind
ST-2	3:40 pm	31.7	49.4	24.1	
ST-3	9:40 am	44.7	62.8	37.9	Local/US Highway 95 traffic, barking dogs, commercial activities, wind
ST-3	4:00 pm	47.7	64.1	36.1	
ST-4	10:00 am	55.6	66.6	45.0	Local/US Highway 95 traffic, commercial activities, jack hammer
ST-4	4:20 pm	55.9	71.1	41.8	
ST-5	10:25 am	49.3	62.9	42.7	Local/US Highway 95 traffic, commercial activities
ST-5	4:40 pm	51.9	63.7	42.3	

Source: Brown-Buntin Associates, Inc. 2015

#### 3.9.4.1 General Project Operations

Sound power levels for the various equipment types were obtained from file data (Brown-Buntin 2015), measured during similar projects. Using the above-described assumptions, potential Project-related noise levels were calculated for the Project vicinity, including residential areas within the Town of Tonopah. Figure 3.9.1 provides a graphical representation of the Project-related noise levels that would likely occur in the vicinity of the Project. Based on the information in Figure 3.9.1, it can be determined that Project-related noise levels at the closest noise-sensitive land uses (residences) would not be expected to exceed 40 dB. Assuming this noise level would occur constantly over a 24-hour period, the resulting Project-related DNL would be in the range of 46-47 dB at the residences closest to the Project Area.

Noise levels produced during proposed mining operations would not exceed the previously described DNL thresholds provided in the EPA Levels Document or those established by HUD. Existing DNL values near and within the Town of Tonopah were determined during the previously described ambient noise measurements to be in the range of 47-54 dB. In regards to the potential of a significant increase in ambient noise levels as defined by the DNL (Table 3.9-1), the Project would not result in a meaningful increase above existing ambient noise levels.

#### 3.9.4.2 Blasting Operations

Blasting would be conducted to break up the rock for hauling and processing. Blasting would be conducted several times per week, as required. In general, blasting is controlled to minimize dispersal of the rock fragments, and to ensure the safety of the workers. Blasting is also

controlled to prevent damage to nearby structures, including any on-site construction trailers. Airborne overpressures produced by blasting are typically measured in terms of the overall peak sound pressure level and not in terms of A-weighted noise levels as referenced by applicable noise standards. See Section 3.5 for a discussion on blasting air overpressure. The dominant frequencies of sound pressures associated with blasting lie in the low frequency range of two Hertz (Hz) to 25 Hz, and most of the acoustical energy is concentrated below about five Hz. Audible sound, in contrast, is usually assumed to begin at 20 Hz, ranging up to 20,000 Hz. People hear best at frequencies in the range of 1,000 Hz to 4,000 Hz, and people hear poorly at the low frequencies associated with blast air overpressures. The A-weighting adjustment factor for sound at 25 Hz (the upper limit of the dominant blast frequencies) is -44.7 dB. There are no published A-weighting correction factors below 12.5 Hz (where the A-weighting correction factor is -63.4 dB). These factors indicate that very high blast air overpressures would be required to generate sound pressure levels that would be audible in an outdoor environment (Table 3.5-4).

Audible noise due to blasting is not commonly considered to be a meaningful source of annoyance if blasting is controlled to meet safety standards on the Project site. Due to the relative infrequency (several times per week) and short duration of the events, blasting noise would not contribute to the overall noise exposure as defined by the DNL at the nearest noise sensitive receivers (residences). Nonetheless, blasting noise is expected to be audible at the nearest receivers, and its sudden occurrence could startle people nearby under certain circumstances.

### **3.9.5 Effects of the Powerline Alternative**

Under the Powerline Alternative the mining operations and the blasting activities would be the same as under the Proposed Action. This alternative would produce approximately the same amount and type of noise as the Proposed Action.

### **3.9.6 Effects of the On-Site Water Alternative**

Under the On-Site Water Alternative the mining operations and the blasting activities would be the same as under the Proposed Action. This alternative would produce approximately the same amount and type of noise as the Proposed Action.

### **3.9.7 Effects of the Knapp Avenue Access Only Alternative**

Under the Knapp Avenue Access Only Alternative the mining operations and the blasting activities would be the same as under the Proposed Action. However, under this alternative, all semi-truck traffic would utilize Knapp Avenue thereby increasing the noise levels along Knapp Avenue.

### **3.9.8 Effects of the No Action Alternative**

Under the No Action Alternative none of the mining operations and blasting activities would occur. Therefore, none of the associated noise would occur under this alternative.

### 3.10 Noxious Weeds, Invasive and Non-native Species

#### 3.10.1 Affected Environment

Noxious weeds, invasive and non-native species are species that are highly competitive, aggressive and spread easily. They typically establish and infest disturbed sites, along roadsides and waterways. Changes in plant community composition from native species to non-native species can change fire regimes, negatively affect habitat quality, biodiversity, and ecosystem structure and function.

Noxious weeds and invasive plant species have been defined as pests by law or regulation. The BLM defines a noxious weed as, “a plant that interferes with management objectives for a given area of land at a given point in time” (BLM 2013a). The Federal Noxious Weed Act of 1974 (as amended by Section 15, Management of Undesirable Plants on Federal Lands, 1990) authorizes cooperation among federal and state agencies in the control of weeds. The BLM BMD recognizes the current noxious weed list designated by the State of Nevada Department of Agriculture (NDOA) statute, found in NAC 555.010. Currently the list contains 47 noxious weed species. When considering whether to add a species to the list, the NDOA makes a recommendation after consulting with outside experts and a panel comprising Nevada Weed Action Committee members. Per NAC 555.005, if a species is found probable to be “detrimental or destructive and difficult to control or eradicate,” the NDOA, with approval of the Board of Agriculture, designates the species as a noxious weed. The species is then added to the noxious weed list in NAC 555.010. Upon listing, the NDOA would also assign a rating of “A,” “B,” or “C” to the species. The rating reflects the NDOA view of the statewide importance of the noxious weed, the likelihood that eradication or control efforts would be successful, and the present distribution of noxious weeds within the state.

An “invasive species” is defined as a species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health (EO 13112, signed February 3, 1999).

The BLM’s policy relating to the management and coordination of noxious weed and invasive plant species is set forth in the BLM Manual 9015 – Integrated Weed Management (BLM 1992b). The BLM’s primary focus is “providing adequate capability to detect and treat smaller weed infestations in high-risk areas before they have a chance to spread.” Noxious weed reduction would be achieved through early detection and rapid response (BLM 2013b).

Baseline botanical surveys, including surveys for noxious weeds, invasive and non-native species, were conducted May 26 through May 30, 2014, within and surrounding the Project Area (Enviroscientists 2014). Table 3.10-1 shows the NDOA rated noxious weeds observed within and surrounding the Project Area and their NDOA categories.

**Table 3.10-1: NDOA Rated Noxious Weeds within and Surrounding the Project Area**

Noxious Weed	NDOA Category	NDOA Category Description
Russian knapweed ( <i>Acroptilon repens</i> )	B	Weeds that are generally established in scattered populations in some counties of the State. Such weeds are subject to: a) active exclusion where possible; and b) active eradication from the premises of a dealer of nursery stock.

Noxious Weed	NDOA Category	NDOA Category Description
Saltcedar ( <i>Tamarix ramosissima</i> )	C	Weeds that are generally established and generally widespread in many counties of the State. Such weeds are subject to active eradication from the premises of a dealer of nursery stock.
Hoary cress ( <i>Cardaria draba</i> )	C	Weeds that are generally established and generally widespread in many counties of the State. Such weeds are subject to active eradication from the premises of a dealer of nursery stock.

Source: NDOA 2015; Enviroscientists 2014

Large occurrences of Russian knapweed were observed in disturbed areas north of the Project Area, while saltcedar dotted the area north of the Project Area. Both Russian knapweed and saltcedar were observed within the Tonopah cemetery but the exact location of these noxious weed occurrences within the cemetery were not mapped. Two occurrences of hoary cress were also mapped north of the Project Area.

Other invasive non-native plant species observed within and surrounding the Project Area but are not classified as noxious weeds in the State of Nevada include: cheatgrass (*Bromus tectorum*); clasping pepperweed (*Lepidium perfoliatum*); prickly Russian thistle (*Salsola tragus*); and saltlover (*Halogeton glomeratus*).

Three introduced tree species were also observed within and near the Slime Wash north of the Project Area: Siberian elm (*Ulmus pumila*); Russian olive (*Elaeagnus angustifolia*); and tree of heaven (*Ailanthus altissima*). These three ornamental tree species are likely the result of the close proximity to the Town of Tonopah and the movement of anthropogenic debris from Tonopah traveling west through the wash during heavy precipitation or flooding events, which could carry ornamental and introduced plant species seeds or shoots that can vegetatively reproduce.

### 3.10.2 Effects of the Proposed Action

Invasive and non-native plant species readily invade areas that have been disturbed and which typically lack or have minimal vegetation cover. Development and operation of the Project would remove or disturb approximately 459 acres of vegetation over the life of the Project, of which approximately 75 acres associated with the open pit would not be reclaimed.

The ACEPMs outlined in Section 2.1.11 would substantially reduce the introduction and spread of noxious weeds, invasive and non-native species. The ACEPMs include the implementation of a noxious weed monitoring and control plan during construction and throughout operations. Implementation of this plan would be coordinated with the BLM.

Reclamation would also reduce the establishment of noxious weeds in the Project Area. Due to concurrent reclamation, the total acreage of vegetation disturbed would not occur all at one time; however, minor populations of weedy annual species (e.g., halogeton and cheatgrass) may become established in localized areas for short periods of time. Growth media stockpiles would be reclaimed with an interim seed mix to stabilize the growth media, reduce soil erosion, and minimize the potential for the establishment of noxious weeds. Successful reclamation of mine related surface disturbance areas would result in the establishment of a permanent vegetative cover, which would minimize the potential establishment of noxious weeds in the long term. Although the open pit would not be reclaimed, noxious weeds would not likely become

established in the open pit due to the absence of soil. As described in Section 2.1.10, WKM would utilize certified weed-free seed mixes for reclamation. Weed control practices would be implemented in coordination with the BLM to limit the spread of noxious weeds, if they appear in the Project Area.

### **3.10.3 Effects of the Powerline Alternative**

Under the Powerline Alternative, development and operation of the Project would remove or disturb approximately 539 acres of vegetation over the life of the Project, of which 75 acres associated with the open pit would not be reclaimed. Like with the Proposed Action the ACEPMs and the reclamation would minimize the alternative's effect on the introduction and spread of noxious weeds, invasive and non-native species.

### **3.10.4 Effects of the On-Site Water Alternative**

Under the On-Site Water Alternative, development and operation of the Project would remove or disturb 453 acres, six acres less than the Proposed Action, of vegetation over the life of the Project, of which 75 acres associated with the open pit would not be reclaimed. As with the Proposed Action the ACEPMs and reclamation would minimize the alternative's effect on the introduction and spread of noxious weeds, invasive and non-native species.

### **3.10.5 Effects of the Knapp Avenue Access Only Alternative**

Under the Knapp Avenue Access Only Alternative development and operation of the Project would remove or disturb approximately 458 acres of vegetation over the life of the Project, of which 75 acres associated with the open pit would not be reclaimed. Unlike the Proposed Action, this alternative would not be using the unpaved South Access Road, which has the potential to limit the potential spread of noxious weeds on public lands. As with the Proposed Action the ACEPMs and reclamation would minimize the alternative's effect on noxious weeds, invasive and non-native species.

### **3.10.6 Effects of the No Action Alternative**

Under the No Action Alternative, development and operation of the Project would not occur and the vegetation would remain in place. There is a potential for the spread of noxious weeds from the continued mineral exploration activities.

## **3.11 Paleontological Resources**

The BLM manages paleontological resources under a number of federal laws including: the FLPMA Sections 310 and 302(b), which direct the BLM to manage public lands 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."

IM No. 2008-009, effective October 15, 2007, defines the BLM classification system for paleontological resources on public lands. The classification system is based on the potential for the occurrence of significant paleontological resources in a geologic unit, and the associated risk for impacts to the resource based on federal management actions.

The regulations define a significant paleontological resource as any paleontological resource that is considered to be of scientific interest, including most vertebrate fossil remains and traces, and certain rare or unusual invertebrate and plant fossils. A significant paleontological resource is considered to be scientifically important because it is a rare or previously unknown species, it is of high quality and well-preserved, it preserves a previously unknown anatomical or other characteristic, provides new information about the history of life on earth, or has identified educational or recreational value. Paleontological resources that may be considered to not have paleontological significance include those that lack provenience or context, lack physical integrity because of decay or natural erosion, or that are overly redundant or are otherwise not useful for research. Vertebrate fossil remains and traces include bone, scales, scutes, skin impressions, burrows, tracks, tail drag marks, vertebrate coprolites (feces), gastroliths (stomach stones), or other physical evidence of past vertebrate life or activities.

This classification system for paleontological resources is intended to provide a more uniform tool to assess potential occurrences of paleontological resources and evaluate possible impacts. The system uses geologic units as base data, which are more readily available to all users, and is intended to be applied in broad approach for planning efforts, and as an intermediate step in evaluating specific projects.

The 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. The following descriptions summarize the PFYC classes.

- Class 1 - Very Low. Geologic units that are not likely to contain recognizable fossil remains include units that are igneous or metamorphic (excluding reworked volcanic ash units) and units that are Precambrian in age or older.
- Class 2 - Low. Sedimentary geologic units not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils. These include the following: 1) vertebrate or significant invertebrate or plant fossils not present or very rare; 2) units that are generally younger than 10,000 years before present; 3) recent aeolian deposits; and 4) sediments that exhibit significant physical and chemical changes (i.e., diagenetic alteration).
- Class 3 - Moderate or Unknown. Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence; or sedimentary units of unknown fossil potential. These rock units are often marine in origin with sporadic known occurrences of vertebrate fossils. Vertebrate fossils and scientifically significant invertebrate or plant fossils known to occur intermittently and predictability is known to be low. The units may also be poorly studied and/or poorly documented.

- *Class 3a* - Moderate. Units are known to contain vertebrate fossils or scientifically significant nonvertebrate fossils, but these 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. Fossiliferous sedimentary units exhibit geologic features and preservational conditions that suggest significant fossils could be present, but little information about the paleontological resources of the unit or the area is known. This may indicate the unit or area is poorly studied, and field surveys may uncover significant finds. The units in this class may eventually be placed in another class when sufficient survey and research is performed.
- Class 4 - High. Geologic units containing 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 disturbing activities may adversely affect paleontological resources in many cases.
  - *Class 4a* - Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than two acres. Paleontological resources may be susceptible to adverse impacts from surface disturbing actions. Illegal collecting activities may impact some areas.
  - *Class 4b* - Areas underlain by geologic units with high potential but have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation due to moderating circumstances. The bedrock unit has high potential, but a protective layer of soil, thin alluvial material, or other conditions may lessen or prevent potential impacts to the bedrock resulting from the activity. These areas include extensive soil or vegetative cover and bedrock exposures are limited or not expected to be impacted and where areas of exposed outcrop are smaller than two contiguous acres. Areas where outcrops form cliffs of sufficient height and slope such that impacts are minimized by topographic conditions and other characteristics are present that lower the vulnerability of both known and unidentified 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.
  - *Class 5a* - Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than two contiguous acres. Paleontological resources are highly susceptible to adverse impacts from surface disturbing actions. Unit is frequently the focus of illegal collecting activities.
  - *Class 5b* - These are areas underlain by geologic units with very high potential but have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation due to moderating circumstances. The bedrock unit has very

high potential, but a protective layer of soil, thin alluvial material, or other conditions may lessen or prevent potential impacts to the bedrock resulting from the activity. These areas have extensive soil or vegetative cover and bedrock exposures are limited or not expected to be impacted. The areas of exposed outcrop are smaller than two contiguous acres. Outcrops from cliffs of sufficient height and slope so that impacts are minimized by topographic conditions. Other characteristics are present that lower the vulnerability of both known and unidentified paleontological resources.

In addition, IM No. 2009-011, effective October 10, 2008, provides guidelines for assessing potential impacts to paleontological resources in order to determine mitigation steps for federal actions on public lands under the FLPMA and the NEPA. These guidelines also apply where a federal action impacts split-estate lands. This IM provides for field survey and monitoring procedures to help minimize impacts to paleontological resources from federal actions in cases where it is determined that significant paleontological resources will be adversely affected by a federal action.

Together, these two IMs (No. 2008-009 and No. 2009-011), 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.

It is the policy of the BLM that potential impacts from federal actions on public lands, including land tenure adjustments, be identified and assessed, and proper mitigation actions be implemented when necessary to protect scientifically significant paleontological resources. This policy also applies to federal actions impacting split-estate lands and is subject to the right of landowners to preclude evaluation and mitigation of paleontological resources on their land. The removal of a significant paleontological resource from public lands requires a Paleontological Resources Use permit for collection. Significant paleontological resources collected from public lands are federal property and must be deposited in an approved repository. Paleontological resources collected from split-estate lands are the property of the surface-estate owner, and their disposition will be in accordance with the surface agreement between the landowner and the permittee.

Surface disturbing activities may cause direct adverse impacts to paleontological resources through the damage or destruction of fossils, or loss of valuable scientific information by the disturbance of the stratigraphic context in which fossils are found. Indirect adverse impacts may be created by increased accessibility to important paleontological resources leading to looting or vandalism. Land tenure adjustments may result in the loss of significant paleontological resources to the public if paleontological resources pass from public ownership. Generally, the project proponent is responsible for the cost of implementing mitigation measures including the costs of investigation, salvage, and curation of paleontological resources.

### **3.11.1 Affected Environment**

The geology of the Project Area is described in Section 3.5.1 of this EA. The lithologic units, volcanism, structure, alteration, and Project-specific geology form the basis for the paleontological resources in the Project Area. The BLM PFYC for the Project Area is likely

Class 1 - Very Low which is described as geologic units not likely to contain recognizable fossil remains include units that are igneous or metamorphic (excluding reworked volcanic ash units) and units Precambrian in age or older. The lithologies at Three Hills consist of extrusive and high level intrusive volcanic rocks and volcanoclastic conglomerates and sandstones formed in a high energy sedimentary environment associated with volcanism. This active environment is not suited for deposition of fossils as they would be destroyed before they could be preserved. In addition, the rocks have been so intensely altered that the presence of any preserved fossil, if the environment was correct, would be highly unlikely. In addition no fossil locations have been identified (Enviroscientists 2015b).

### **3.11.2 Effects of the Proposed Action**

The Proposed Action would have no effect on paleontological resources since those resources are not present in the Project Area.

### **3.11.3 Effects of the Powerline Alternative**

The Powerline Alternative would have no effect on paleontological resources since those resources are not present in the Project Area.

### **3.11.4 Effects of the On-Site Water Alternative**

The On-Site Water Alternative would have no effect on paleontological resources since those resources are not present in the Project Area.

### **3.11.5 Effects of the Knapp Avenue Access Only Alternative**

The Knapp Avenue Access Only Alternative would have no effect on paleontological resources since those resources are not present in the Project Area.

### **3.11.6 Effects of the No Action Alternative**

The No Action Alternative would have no effect on paleontological resources since those resources are not present in the Project Area.

## **3.12 Public Safety**

The major public safety concerns associated with the Project are the transportation of hazardous materials through the Town of Tonopah, impacts due to ground vibrations from blasting, and vehicle collisions. Currently there are no regular sources of ground vibrations from blasting in the vicinity of the Town of Tonopah. Transportation of hazardous materials is discussed in Section 3.21.

### **3.12.1 Affected Environment**

Section 3.18.1.3 of the EA discusses the current traffic volumes and the types of vehicles using the transportation network in and around the Town of Tonopah. Traffic volumes on US Highway 6/95 north of the Town of Tonopah, but south of the Miller Rest Area were 2,100 Annual Average Daily Traffic (AADT) vehicle trips. This volume increases to 5,100 AADT vehicle trips

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at approximately the Nye/Esmeralda County Line. This traffic volume includes regional north-south travel on US Highway 95, as well as local traffic between the Town of Tonopah and southern Big Smokey Valley (i.e., solar plant construction). In the Town of Tonopah, the traffic volumes on the same roadway increase to 7,300 AADT vehicle trips. This is interpreted to result from in Town of Tonopah local traffic. The US highways divide in the Town of Tonopah with US Highway 95 continuing south and US Highway 6 to the east. Traffic volumes on US Highway 6 immediately east of the junction with US Highway 95 were 1,700 AADT vehicle trips. Further to the east on US Highway 6 the AADT vehicle trips decreased to 600, which included regional traffic, as well as some local traffic. Continuing south on US Highway 95, but still within the Town of Tonopah, there were 5,600 AADT vehicle trips. South of the Town of Tonopah and the Nye/Esmeralda County line, the traffic volumes were 2,000 AADT vehicle trips. Therefore, the regional north-south traffic on US Highway 95 was approximately 2,000 AADT vehicle trips, with a few hundred AADT vehicle trips on US Highway 6 heading east. The local traffic on US Highway 95 and US Highway 6 varies from approximately 1,500 to 5,000 AADT vehicle trips. Using the traffic count point south of the Town of Tonopah at the county line as the reference point for the north-south traffic on US Highway 95, the traffic was approximately 77 percent cars and 23 percent trucks and approximately 75 percent of the trucks were semi- or multi-trailer (NDOT 2014). These vehicle percentages would not be accurate when considering the traffic in and around the Town of Tonopah, where the increased traffic volumes would likely be attributable to cars and light-duty trucks. Based on these data, there were approximately 500 AADT vehicle trips by trucks within the US Highway 95 corridor.

Crash statistics on US Highway 95 and US Highway 6 for the vicinity of the Town of Tonopah were obtained from NDOT for the years 2011 through 2014. Table 3.12-1 shows the year, crash severity, and numbers.

**Table 3.12-1: Crash Statistics, 2011 Through 2014**

Roadway	Property Damage Only				Injury Crash				Fatal Crash			
	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014
US Highway 95 <sup>1</sup>	5	6	11	3	9	8	7	0	3	1	1	0
US Highway 6 <sup>2</sup>	1	1	4	0	2	2	2	0	0	0	0	0

Source: NDOT 2014

1 – This includes US Highway 95 from 15 miles south of Tonopah to Tonopah, US Highway 95 through Tonopah, and US Highways 95 and 6 from Tonopah to 15 miles north of Tonopah.

2 – This includes US Highway 6 from the junction with US Highway 95 in Tonopah to 20 miles east of Tonopah.

The five fatalities on US Highway 95 occurred in three crashes north of the Town of Tonopah and involved smaller vehicles. Of the 22 crashes that involved injuries on US Highway 95, three were the result of tractor-trailer trucks. All the crashes in the Town of Tonopah on US Highway 95 that involved injuries involved smaller vehicles. All of the 25 property damage only crashes on US Highway 95 involved smaller vehicles.

There were 12 crashes on US Highway 6 between the junction with US Highway 95 and approximately 20 east of Tonopah. Six of the crashes resulted in eight injuries. The remaining crashes were property damage only. Ten of the crashes were single vehicle non-collision. Three of the crashes involved tractor trailer trucks.

Over the four year period that traffic data was reviewed there were 66 crashes and six involved tractor-trailer truck. During that same period there were approximately 730,000 tractor-trailer truck trips through the Town of Tonopah. With six crashes involving tractor-trailer truck during this period, there would be, on average one crash involving a tractor-trailer every 120,000 trips.

### **3.12.2 Effects of the Proposed Action**

#### **3.12.2.1 Transportation of Hazardous Materials**

Table 2.1-4 lists the types of hazardous materials that would be used for the Project and monthly shipment frequency potentially transported through the Town of Tonopah. As discussed in Section 3.18.2, during the operational phase of the Project there would be approximately 25 tractor-trailer truck deliveries per week and these deliveries would include hazardous material, such as fuels and sodium cyanide. This tractor-trailer truck traffic associated with the Project would be an approximately 0.7 percent increase over current traffic levels. Over the life of the Project there would be an estimated 3,600 tractor-trailer truck trips, which is approximately three percent of the average number of trips associated with tractor-trailer crashes under the current traffic conditions. Based on this assessment, the Project would likely not change the potential public safety risk from the transportation of materials to the Project.

#### **3.12.2.2 Blasting Effects**

##### *Flyrock*

If a blast is not correctly conducted then the throw of material outside the cleared blast zone has the potential to be a serious safety hazard.

##### *Fugitive Dust*

Blasting operations can produce excessive dust when the explosives are under-confined. However, blasting operations have been included in the air quality analysis (Section 3.3.2) and dust emissions were in compliance with the health based NAAQS. Therefore, the dust generation would be localized to the mine area.

##### *Blast Fumes*

When an ammonium nitrate-based bulk explosive detonates completely or ideally, the primary gases produced are water in the form of steam (H<sub>2</sub>O), carbon dioxide (CO<sub>2</sub>), and nitrogen (N<sub>2</sub>). If a non-ideal detonation or deflagration occurs, toxic gases are created, including NO<sub>2</sub>, nitric oxide (NO), and CO (MDA 2014). It should be understood that all nitrate-based bulk explosives performance, and the amount of toxic fumes produced, is adversely affected by changes in pressure, temperature, confinement, diameter, exposure to water, etc. There are many factors that can contribute to the production of toxic blast fumes.

### **3.12.3 Effects of the Powerline Alternative**

Under the Powerline Alternative, the mining operations and blasting activities would be the same as under the Proposed Action. This alternative would produce approximately the same amount and type of public safety issues as the Proposed Action.

### **3.12.4 Effects of the On-Site Water Alternative**

Under the On-Site Water Alternative, the mining operations and blasting activities would be the same as under the Proposed Action. This alternative would produce approximately the same amount and type of public safety issues as the Proposed Action.

### **3.12.5 Effects of the Knapp Avenue Access Only Alternative**

Under the Knapp Avenue Access Only Alternative, the mining operations and blasting activities would be the same as under the Proposed Action. This alternative would produce a greater amount of public safety issues as compared to the Proposed Action. Under this alternative the approximately 25 tractor-trailer truck trips per week would travel on Knapp Avenue to reach the Project Area. Knapp Avenue is a narrow two lane, unstriped county road and truck delivery traffic would cause some level of congestion, as well as the transport of hazardous materials adjacent to numerous residences and a church (Figure 3.18.1). The turn from US Highway 95, traveling south to Knapp Avenue is at an acute angle (less than 90 °), which would require trucks making the right turn on to Knapp Avenue to make the turn from the left-hand south-bound lane of the center turn lane. This maneuver would be an irregular right turn that would expose the truck to side-swipe of 90 degree crashes by inattentive south-bound vehicles.

### **3.12.6 Effects of the No Action Alternative**

Under the No Action Alternative, none of the mining operations and blasting activities would occur. Therefore, none of the associated public safety issues would occur under this alternative.

## **3.13 Rangeland Management**

### **3.13.1 Affected Environment**

The Project Area is located within portions of the Montezuma and Silver King Grazing Allotments. The Montezuma Grazing Allotment (00094) contains 388,211 acres and the permitted animal unit months (AUMs) on federal land are 5,267. The number of acres per AUM is 73. The fenced portion of the Project Area contains approximately 341 acres or 0.09 percent of the allotment. The current permittee for the Montezuma Grazing Allotment is Yellow Hills.

The Silver King Grazing Allotment (05308) contains 9,339 acres and the permitted AUMs on federal land are 440. The number of acres per AUM is 21. The fenced portion of the Project Area contains approximately 22 acres or 0.2 percent of the allotment. There are no current permittees in the Silver King Grazing Allotment.

### **3.13.2 Effects of the Proposed Action**

The Proposed Action would remove approximately 341 acres of active grazing opportunities in the Montezuma Grazing Allotment within the fenced portion of the Project Area and impact approximately four AUMs, or approximately 0.08 percent of the total active AUMs in the Montezuma Grazing Allotment. The Project would not impact the Silver King Grazing Allotment since there are no active AUMs in the allotment. The fence would be removed after mining activities have ceased, and the mine facilities would be reclaimed and revegetated, returning approximately 291 acres for available grazing opportunities within the Montezuma Grazing Allotment. The open pit would not be reclaimed, permanently removing approximately 75 acres of grazing opportunities, and approximately one AUM from the Montezuma Grazing Allotment.

### **3.13.3 Effects of the Powerline Alternative**

Under the Powerline Alternative, impacts to rangeland management would be similar as under the Proposed Action, because disturbance associated with the powerline would be primarily conducted outside the fence boundary.

### **3.13.4 Effects of the On-Site Water Alternative**

Under the On-Site Water Alternative, impacts to rangeland management would be the same as under the Proposed Action, because the water line would be buried, so the presence of the fence would not result in any additional impacts under this alternative.

### **3.13.5 Effects of the Knapp Avenue Access Only Alternative**

Under the Knapp Avenue Access Only Alternative, impacts to rangeland management would be the same as under the Proposed Action, so the presence of the fence would not result in any additional impacts under this alternative.

### **3.13.6 Effects of the No Action Alternative**

Under the No Action Alternative, up to five acres of surface disturbance could occur within the Project Area under Notice-level exploration activities and impact approximately 0.001 percent of the Montezuma Grazing Allotment. This would result in the temporary impact to approximately 0.07 AUM, or 0.001 percent of the total active AUMs in the Montezuma Grazing Allotment. Reclamation of surface disturbance would gradually eliminate potential impacts to rangeland management. Impacts to rangeland management would be similar, but proportionally less than the Proposed Action (impacts to approximately 0.07 AUM versus impacts to approximately four AUMs associated with the Proposed Action).

## **3.14 Recreation**

### **3.14.1 Affected Environment**

Recreational uses of the public land in the vicinity of the Project Area consist of dispersed recreational activities such as hunting, biking, primitive camping, rock hounding, and off-road

vehicle travel. Ideal recreational opportunities occur in the White Mountains, such as trout fishing from streams and ponds near Boundary Peak. In addition, a northern portion of Death Valley National Park is located in the southwestern corner of Esmeralda County (Esmeralda County 2010).

### **3.14.2 Effects of the Proposed Action**

The Proposed Action would remove approximately 480 acres of dispersed recreation opportunities within the fenced portion of the Project Area. In addition, a road claimed by Esmeralda County would be made unavailable for public use, access would be rerouted around the mine facilities to allow public access primarily to areas to the west and southwest of the Project Area. The fence would be removed after mining activities have ceased, returning approximately 405 acres for dispersed recreation opportunities. The open pit would not be reclaimed, permanently removing approximately 75 acres of public land available for dispersed recreation opportunities.

### **3.14.3 Effects of the Powerline Alternative**

Under the Powerline Alternative, impacts to recreation would be similar to, but slightly greater than under the Proposed Action. The placement of, and disturbance associated with, the powerline would be primarily conducted outside the fence boundary, which would result in an additional approximately 80 acres where recreation activities would be limited.

### **3.14.4 Effects of the On-Site Water Alternative**

Under the On-Site Water Alternative, impacts to recreation would be the same as under the Proposed Action, as the water line would be buried, so the presence of the fence would not result in any additional impacts under this alternative.

### **3.14.5 Effects of the Knapp Avenue Access Only Alternative**

Under the Knapp Avenue Access Only Alternative, impacts to recreation would be the same as under the Proposed Action, so the presence of the fence would not result in any additional impacts under this alternative.

### **3.14.6 Effects of the No Action Alternative**

Under the No Action Alternative, up to five acres of surface disturbance could occur within the Project Area under Notice-level exploration activities. Under this alternative, the exploration areas would not be fenced and the road claimed by Esmeralda County would not be rerouted. Therefore, impacts to dispersed recreation under this alternative would be proportionally less than under the Proposed Action.

### **3.15 Socioeconomics**

#### **3.15.1 Affected Environment**

The Project Area is located in Esmeralda County approximately one mile west of the Town of Tonopah, Nevada. Esmeralda County is located in west central Nevada and encompasses 3,589 square miles, or 2.29 million acres. Approximately 87 percent of the land in the county is administered by the federal government, primarily by the BLM. US Highway 95 runs south from Mineral County, then east to the Town of Tonopah, then south again through Goldfield. US Highway 6 traverses the northern portion of the County in an east-west direction. The Project Area is accessed off of US Highway 95 from the Town of Tonopah.

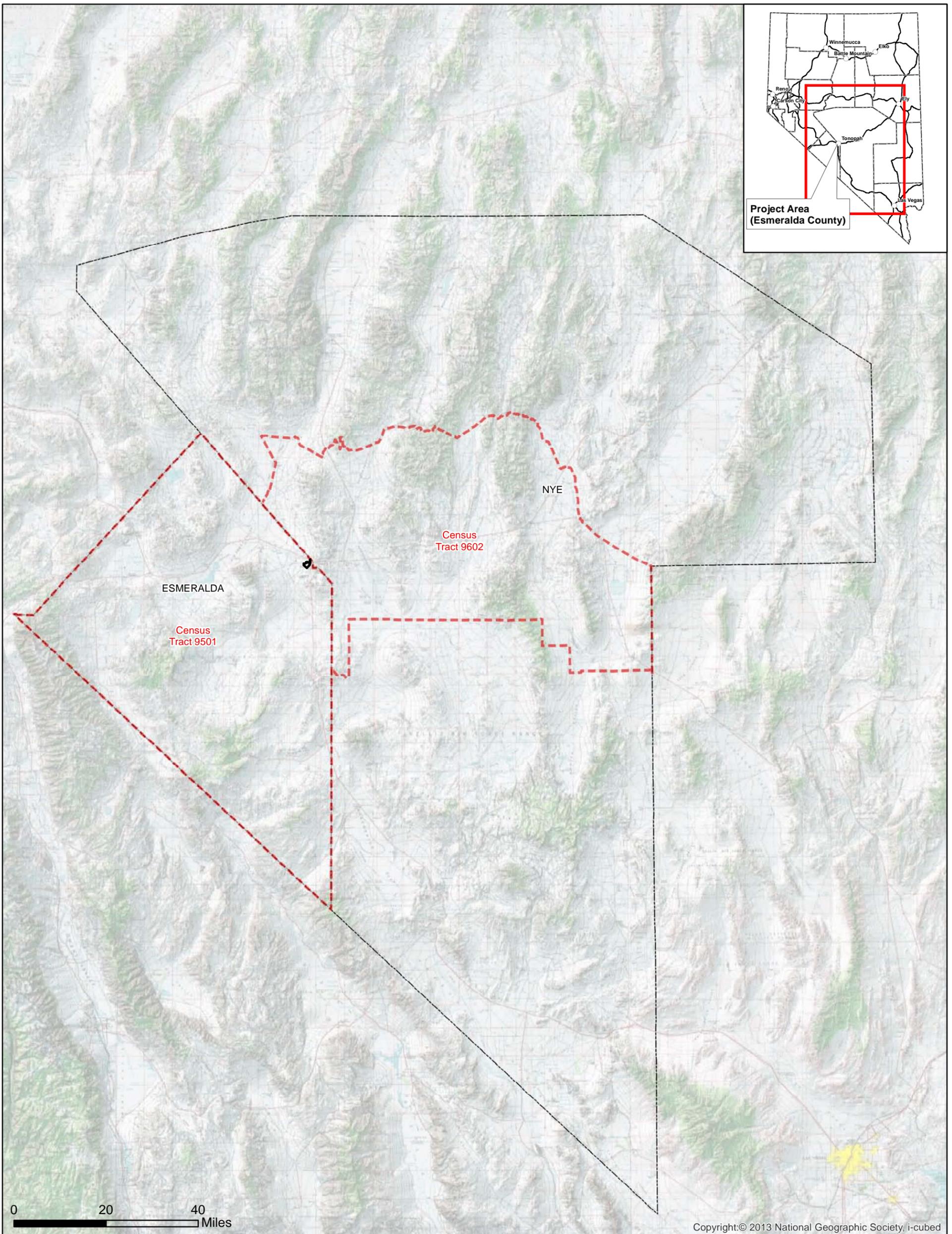
The assessment area defined for the Socioeconomics section of this EA is the entirety of Esmeralda County and Census Tract 9602 in Nye County (Figure 3.15.1). The reason for selecting this tract is because of potential Project employees living in Tonopah, the community located approximately one mile east of the Project Area. Baseline data were collected from a number of federal, state, and local sources. There are sufficient current data on Esmeralda County for a full analysis in this section of the EA. For Census Tract 9602 of Nye County, data are not available in all categories as much of the data are not separated into census tract levels.

For this Project, it would not be considered beneficial to include data from the entirety of Nye County because many of the averaged numbers would be taken from more densely populated areas such as Pahrump and less densely populated areas in the unincorporated portions of the county. These areas are not directly or indirectly impacted by the Project. Where data are available on the census tract level, these data are presented in the relevant tables in the following sections.

##### **3.15.1.1 Population and Demography**

###### *Population*

Table 3.15-1 summarizes the past, present, and projected populations of the assessment area and the State of Nevada. The population in Esmeralda County decreased by approximately 20 percent between 2000 and 2010, and the population in Census Tract 9602 of Nye County decreased by approximately ten percent between 2000 and 2010. The population in Esmeralda County increased by approximately five percent between 2010 and 2014 and is in line with the increase that occurred in the entire State of Nevada. The Nevada State Demographer's Office (NSDO) projected a population change by 2032 of almost nine percent in Esmeralda County and approximately 16 percent for the State of Nevada.



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**Explanation**

-  Project Area
-  County Boundary
-  Census Tracts



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**BUREAU OF LAND MANAGEMENT**

**THREE HILLS MINE PROJECT**

**Socioeconomics Assessment Area**

**Figure 3.15.1**

10/07/2015

**Table 3.15-1: Population Data for the Study Area and Projected Populations in the Study Area and State of Nevada**

Location	Population			Percent Change	Population Projection	Percent Change
	2000 <sup>1</sup>	2010 <sup>2</sup>	2014 <sup>3</sup>	2000-2014	2032 <sup>4</sup>	2014-2032
Esmeralda County	971	783	822	-15	893	8.6
Census Tract 9602 of Nye County	2,822	2,545	--	--	--	--
State of Nevada	1,998,257	2,700,551	2,839,099	42	3,303,194	16.3

<sup>1</sup>US Census Bureau 2000

<sup>2</sup>US Census Bureau 2010a

<sup>3</sup>US Census Bureau 2015

<sup>4</sup>NSDO 2014

*Demography*

Age Distribution

Table 3.15-2 shows the age distribution in the assessment area and the State of Nevada populations. Young children, ages 0 to 4, represented similar percentages in Esmeralda County, Census Tract 9602 of Nye County, and the State of Nevada. The percentages for the remaining age groups were very similar for Census Tract 9602 of Nye County and the State of Nevada, while the 5 to 19 age group and 20 to 64 age group in Esmeralda County were six percent and eight percent less than the rest of the assessment area, respectively. The 65 and over age group was approximately 15 percent greater than Census Tract 9602 of Nye County and the State of Nevada.

**Table 3.15-2: Age Distribution of Assessment Area and State of Nevada Populations**

Location	Age 0-4		Age 5-19		Age 20-64		Age 65+		Total Population
	Quantity	% of Total	Quantity	% of Total	Quantity	% of Total	Quantity	% of Total	
Esmeralda County	39	5	107	14	435	55	202	26	783
Census Tract 9602 of Nye County	160	6	503	20	1,602	63	280	11	2,545
State of Nevada	187,478	7	548,850	20	1,639,864	61	324,359	12	2,700,551

Source: US Census Bureau 2010b

Racial Composition

Table 3.15-3 summarizes the racial composition of the populations in the assessment area. The assessment area has significantly higher populations of White persons compared to all other persons. The State of Nevada has a higher concentration of Black or African American persons, Asian persons, and other races compared to the assessment area.

**Table 3.15-3: Racial Composition of Assessment Area and State of Nevada Populations**

Location	White	Black or African American	American Indian or Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Other Race	Two or More Races	Total Population
	Quantity/Percent of Total							
Esmeralda County	661/84.4	0	33/4.2	3/0.4	0	52/6.6	34/4.3	783
Census Tract 9602 of Nye County	2,288/89.9	72/2.8	21/0.8	14/0.5	7/0.3	70/2.8	73/2.9	2,545
State of Nevada	1,786,688/ 66.2	218,626/ 8.1	32,062/ 1.2	195,436 /7.2	16,871/ 0.6	324,793 /12	126,075 /4.7	2,700,551

Source: US Census Bureau 2010b

### 3.15.1.2 Economy and Employment

Employment by industry for the assessment area is summarized in Table 3.15-4. Most of the industry counts in Esmeralda County were not shown to avoid disclosure of confidential information, but the largest reporting industries included government and government enterprises (10.2 percent), real estate and rental and leasing (9.6 percent), transportation and warehousing (8.5 percent), and administrative and waste management services (eight percent). The largest industries in Census Tract 9602 of Nye County were educational services (41.1 percent) and government and government enterprises (34.4 percent). In the entire State of Nevada, the largest industries were accommodation and food services (19.7 percent), government and government enterprises (11 percent), and retail trade (10.3 percent).

**Table 3.15-4: 2011 Employment by Industry in Assessment Area Compared with the State of Nevada**

Industry	Esmeralda County	Census Tract 9602 of Nye County	State of Nevada
	Quantity/Percent of Total		
Farm Employment	36/3.8	--	4,566/3.0
Forestry, Fishing, and Related Activities	D	4/0.2	1,682/0.1
Mining	D	17/0.8	17,963/1.2
Utilities	0	1/0.0	4,357/0.3
Construction	D	7/0.3	68,439/4.5
Manufacturing	D	0/0.0	42,490/2.8
Wholesale Trade	D	5/0.2	37,639/2.5
Retail Trade	D	78/3.9	155,307/10.3
Transportation and Warehousing	80/8.5	6/0.3	55,323/3.7
Information	D	3/0.1	17,578/1.2
Finance and Insurance	0	13/0.6	86,914/5.8
Real estate and rental and leasing	90/9.6	12/0.6	102,778/6.8
Professional, scientific, and technical services	29/3.1	23/1.1	81,612/5.4

Industry	Esmeralda County	Census Tract 9602 of Nye County	State of Nevada
	Quantity/Percent of Total		
Management of companies and enterprises	0	1/0.0	21,629/1.4
Administrative and waste management services	75/8.0	23/1.1	100,726/6.7
Educational Services	0	824/41.1	13,975/0.9
Health Care and Social Assistance	L	94/4.7	113,032/7.5
Arts, entertainment, and recreation	39/0.4	12/0.6	48,603/3.2
Accommodation and food services	D	190/9.5	297,117/19.7
Other services, except public administration	D	3/0.1	69,330/4.6
Government and government enterprises	96/10.2	690/34.4	166,538/11.0

Source: Bureau of Economic Analysis (BEA) 2014a; BEA 2014b: US Census Bureau 2011a

Notes: D – Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals; L – Less than ten jobs, but the estimates for this item are included in the totals.

Labor force and employment statistics for 2009 to 2014 for the assessment area and the State of Nevada are presented in Table 3.15-5. The resident labor force in Esmeralda County is limited based on the small population base. Between 2009 and 2010, the unemployment rate in Esmeralda County increased by approximately 31 percent, as the total labor force declined and the number of unemployed remained relatively the same. During this time, the unemployment rate in the State of Nevada also increased; however, this was due to an increase in the total labor force and increase in the total number of unemployed. Between 2010 and 2014, the unemployment rates in both Esmeralda County and the State of Nevada decreased each year. The unemployment rate in Census Tract 9602 of Nye County increased from 2010 to 2011, decreased by 2012, then increased again by 2013. This pattern was not reflective of either Esmeralda County or the State as a whole.

**Table 3.15-5: Labor Force Statistics in Assessment Area Compared with State of Nevada**

Labor Force	2009	2010	2011	2012	2013	2014
<b>Esmeralda County<sup>1</sup></b>						
Total Labor Force	489	414	416	474	545	534
Employment	455	376	383	443	519	510
Unemployment	34	38	33	31	26	24
Unemployment Rate (percent)	7.0	9.2	7.9	6.5	4.8	4.5
<b>Census Tract 9602 of Nye County<sup>2,3,4,5</sup></b>						
Total Labor Force	--	2,620	2,542	2,376	2,453	--
Employment	--	1,394	1,424	1,525	1,452	--
Unemployment	--	1,226	1,118	851	1,001	--
Unemployment Rate	--	5.0	6.3	4.3	6.3	--

<b>Labor Force</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>State of Nevada<sup>1</sup></b>						
Total Labor Force	1,349,299	1,358,578	1,373,663	1,378,361	1,252,326	1,394,599
Employment	1,196,758	1,174,774	1,194,061	1,224,415	1,252,326	1,286,474
Unemployment	152,541	183,804	179,602	153,946	132,137	108,125
Unemployment Rate	11.3	13.5	13.1	11.2	9.5	7.8

<sup>1</sup>Department of Employment, Training, and Rehabilitation (DETR) 2015; <sup>2</sup>US Census Bureau 2010c; <sup>3</sup>US Census Bureau 2011b; <sup>4</sup>US Census Bureau 2012; <sup>5</sup>US Census Bureau 2013

Local personal income trends in Esmeralda County are shown in Table 3.15-6. Personal earnings increased each year from 2009 to 2013. The adjustment for residence values decreased each year and was reflected as a negative number in 2013, showing that most of the labor earnings flowed out of Esmeralda County and the local economy, as a majority of workers commuted into Esmeralda County for work from other areas. However, the net outflow of earnings in 2013 was only approximately 8.5 percent.

**Table 3.15-6: Esmeralda County Personal Income and Place of Residence, 2009-2013**

<b>Description</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
Earnings by Place of Work	\$11,968	\$12,299	\$17,879	\$21,265	\$26,922
Less: contributions for government social insurance	\$1,160	\$1,325	\$1,584	\$2,058	\$2,884
Plus: adjustment for residence	\$7,605	\$4,811	\$2,549	\$928	-\$2,299
Equals: net earnings by place of residence	\$18,413	\$15,785	\$18,844	\$20,135	\$21,739
Plus: dividends, interest, and rent	\$6,700	\$6,278	\$7,199	\$8,695	\$8,819
Plus: personal current transfer receipts	\$6,912	\$7,749	\$7,750	\$7,426	\$7,369

Source: BEA 2014c

The per capita personal income in Esmeralda County compared to the per capita personal income in Nevada and the nation is shown in Table 3.15-7. Esmeralda County's per capita personal income was greater than the State of Nevada each year between 2009 and 2013, and greater than the nationwide per capita income every year except 2010.

**Table 3.15-7: Per Capita Personal Income, 2009-2013**

<b>Jurisdiction</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
Esmeralda County	39,733	38,418	44,817	47,518	45,585
Nevada	36,840	36,657	37,445	39,229	39,235
United States	39,379	40,144	42,332	44,200	44,765

Source: BEA 2014d

### 3.15.1.3 Housing

Housing characteristics within the assessment area are summarized in Table 3.15-8. The numbers for Census Tract 9602 of Nye County include the Town of Tonopah, where it is expected most of

the workers at the Project would live. Based on the 2010 Census, there were more housing units in the assessment area than occupants.

**Table 3.15-8: Housing Characteristics of the Assessment Area and State of Nevada**

Location	Total Housing Units	Occupied Housing Units	Owner-Occupied	Renter-Occupied
Esmeralda County	850	389	290	99
Census Tract 9602 of Nye County	1,636	1,086	600	486
State of Nevada	1,173,814	1,006,250	591,480	414,770

Source: US Census Bureau 2010b

In addition to the permanent residences, there are temporary residences throughout the assessment area, which include motels, recreational vehicle (RV) parks, and campgrounds. In Esmeralda County, there is one hotel in the community of Goldfield with eight rooms, and the Goldfield RV Park. The Esmeralda RV Park is located in the community of Dyer in Fish Lake Valley and consists of 23 developed RV spaces with electrical and sewer hook-ups and three fully furnished cabins (Esmeralda County 2015). The Goldpoint Ghost Town has five old miner’s cabins for rent as well as a two-bedroom house and seven trailer spaces (Gold Point 2015).

Within Census Tract 9602 of Nye County, the Town of Tonopah is the only largely populated area. There are eight hotels in Tonopah with a combined total of approximately 375 rooms. There are three RV parks in Tonopah, with 20 spaces at the Tonopah Station RV Park (Tonopah 2015), and additional spaces at the other two RV parks.

### 3.15.1.4 Community Facilities and Services

#### *Public Safety*

The Nevada Highway Patrol Division (NHPD) provides law enforcement protection services along the roads and highways maintained or funded by the State of Nevada and the federal aid primary and secondary road system. The NHPD is also the primary motor vehicle accident investigation agency in the state. The only substation within the socioeconomics assessment area is in Tonopah (NHPD 2015).

#### Esmeralda County

Law enforcement services in Esmeralda County are provided by the Esmeralda County Sheriff’s Office (ECSO). As of July 2015, there are a total of five deputies located throughout the County. There are three deputies stationed in Goldfield, one deputy stationed in Fish Lake Valley, and one deputy stationed in Silver Peak. The Goldfield deputies cover the County from Tonopah south to the Nye County line south of Goldfield. The Fish Lake Valley and Silver Peak deputies cover the County from Tonopah north to the Mineral County line. The response time for service calls is approximately 30 to 35 minutes (Boteler 2015). There is a jail facility located in the rear of the court house in the community of Goldfield and contains two levels of a total of 18 cells that currently houses inmates (Esmeralda County 2015).

Fire protection services in Esmeralda County are provided by volunteers in the communities. There are volunteer fire services in Goldfield, Silver Peak, Fish Lake Valley, and Gold Point (Esmeralda County 2015). There are eight volunteers in Goldfield, seven volunteers in Silver Peak, nine volunteers in Fish Lake Valley, and four volunteers in Gold Point (Scott 2015). Each fire district has one engine and one rescue vehicle (Lee 2015).

The County relies on volunteer ambulance services in each community. There are volunteer ambulance services in Goldfield, Fish Lake Valley, and Silver Peak (Esmeralda County 2015). The Goldfield and Silver Peak ambulances transport patients to the Nye Regional Medical Center in Tonopah, while the Fish Lake Valley ambulance transports patients to the Northern Inyo Hospital in Bishop, California (Boteler 2015).

#### Nye County (Census Tract 9602)

Law enforcement services in Nye County are provided by the Nye County Sheriff's Office (NCSO). The NCSO provides general law enforcement services, including traffic enforcement, crime investigation, death investigation, and medical call response. The North Area Command serves the area within Census Tract 9602 and covers approximately 10,000 square miles. As of July 2015, the North Area Command has 14 patrol officers, three sergeants, and one detective, with two sergeants, seven patrol officers, and one detective located in the Sheriff's Office in Tonopah (Downing 2015).

Fire protection services in the Town of Tonopah in Nye County Census Tract 9602 are provided by Tonopah Fire Service, a volunteer service, which is overseen by the Town of Tonopah. The Round Mountain/Smoky Valley Fire Services, also staffed by volunteers, is located just outside of this census tract, but provide services within the census tract (Nye County 2015). The Tonopah Fire Service staffs approximately 15 volunteer firefighters and has three Type I fire engines and one rescue vehicle (Payne 2015).

Fire fighting on public land in Nye County Census Tract 9602 is dispatched by the Central Nevada Interagency Dispatch Center located in Winnemucca, Nevada.

The Tonopah Volunteer Ambulance Service has a roster of approximately 15 volunteer EMTs. There are two Type I ambulances. In the event of a serious injury or emergency, the ambulance service coordinates with air ambulance services to retrieve patients needing hospital services (Payne 2015).

#### *Health Care and Social Services*

##### Esmeralda County

There are no medical or health facilities in Esmeralda County. The Senior Transportation Program provides weekly service to seniors over 60 years of age (and those under 60 on a space available basis) into Tonopah for hot meals, grocery shopping, banking, and medical appointments. Shopping trips and social trips to other areas are scheduled as needed (Esmeralda County 2015). The County provides health and social services such as the County health nurse, distribution of food commodities, indigent medical services, indigent public defender services, and emergency gas payment services (Boland 2015).

Nye County (Census Tract 9602)

There is a community health nurses’ clinic in Tonopah provided through the Nevada Division of Public and Behavioral Health (NDPBH) that serves Nye and Esmeralda Counties. The clinic currently offers the following services: cancer screening; communicable disease services; dental health for all ages; family planning services; HIV/AIDS services; immunizations; school health services (school nurses for Esmeralda County only); sexually transmitted disease services; tuberculosis services; and well-child and healthy kids services (NDPBH 2015).

Nye County Health and Human Services Department provides the following programs: emergency assistance; long-term care; medical indigent services; care under the Ryan White Comprehensive Aids Resource Emergency Act; sexual assault victim’s assistance; care for screening or for individuals who have breast cancer under the Susan G. Komen for the Cure grant money; and the free prescription discount card program (Nye County 2015).

*Public Education*

Esmeralda County

Public education in Esmeralda County is provided by the Esmeralda County School District (ECSD). There are three schools in Esmeralda County. Current enrollment numbers for the ECSD are shown in Table 3.15-9. Dyer Elementary has an enrollment of approximately 36 students for the 2014/2015 school year. Current enrollment at Goldfield Elementary and Silver Peak Elementary are not available in order to safeguard student privacy (Nevada Department of Education [NDE] 2014).

Nye County (Census Tract 9602)

There are three schools in Nye County within Census Tract 9602: Tonopah Elementary School and Tonopah Middle School (contained within the same facility); and Tonopah High School (NDE 2014). Current enrollment numbers are shown in Table 3.15-9.

**Table 3.15-9: School District Enrollment**

<b>Grade</b>	<b>2013-2014</b>	<b>2014-2015</b>
<i>Esmeralda County School District</i>		
Pre- Kindergarten – 8	79	74
9-12	0	0
<b>Total</b>	<b>79</b>	<b>74</b>
<i>Nye County School District – Census Tract 9602</i>		
Pre-Kindergarten – 8	N/A	266
9-12	N/A	118
<b>Total</b>	<b>N/A</b>	<b>384</b>

Source: NDE 2014

N/A = data not available

## *Water Service*

### Esmeralda County

Public water service in Esmeralda County is provided by seven public water systems including the following: Goldfield Town Water; Silver Peak Water System; Boonies; Dyer Bar and Café; Esmeralda Market; NDOT Millers NV Roadside Park RP801ES; and Dyer Elementary School. Goldfield Town Water is a community water system serving a population of 350 from two ground water wells. The Silver Peak Water System is also a community water system serving a population of 138 from two ground water wells. Boonies is a noncommunity water system serving a population of 50 from one ground water well. Dyer Bar and Café and Esmeralda Market are noncommunity water systems both serving populations of 25 from two ground water wells each. The NDOT Millers NV Roadside Park RP801ES system is a noncommunity system serving a population of 100 from one ground water well. Dyer Elementary School is a nontransient noncommunity water system serving a population of 42 from one ground water well (NDEP Bureau of Safe Drinking Water [BSDW] 2013).

The remainder of Esmeralda County obtains water through individual wells or springs. However, the portion of the county adjacent to the Town of Tonopah receives water provided by Nye County through TPU.

### Nye County (Census Tract 9602)

Within Census Tract 9602 of Nye County, there are six public water systems: TPU; Tonopah Conservation Camp; Tonopah Electronic Combat Range O and M; Tonopah Test Range Area 10; Tonopah Test Range Mancamp; and Tonopah Test Range Site 6. TPU is a community water system serving a population of 2,853 from six ground water wells. The Tonopah Conservation Camp system is a nontransient noncommunity water system that serves a population of 150 from purchased ground water from an off-site source. The Tonopah Electronic Combat Range O and M system is a nontransient noncommunity water system that serves a population of 127 from one ground water well. Tonopah Test Range Area 10 is a nontransient noncommunity water system that serves a population of 130 from three ground water wells. Tonopah Test Range Mancamp is a nontransient noncommunity water system that serves a population of 30 from two ground water wells. Tonopah Test Range Site 6 is a nontransient noncommunity water system that serves a population of 150 from one ground water well (NDEP BSDW 2013).

TPU currently pumps water from two locations characterized as the lower well field, containing Wells 1 through 8, and the upper well field, containing Wells 9 and 10, both located in Ralston Valley. Wells 1 through 4 were taken offline in 2013 so are currently not being utilized, Wells 5 through 8 were rehabilitated in 2013, and Wells 9 and 10 were drilled in 2012. Wells 5 through 8 are currently able to produce up to approximately 175 gpm per well or 700 gpm total. Wells 9 and 10 are able to produce up to a maximum rate of approximately 800 gpm individually or 1,200 gpm when operating together (TPU 2015).

The TPU water system currently includes three active booster pumping stations: Booster Pump Station #2; Bryan Pump Station; and California Pump Station. Booster Pump Station #2 is located approximately two-thirds of the way into Tonopah along the 14-inch transmission main. This pump station was rehabilitated in 2014 and includes three equally sized vertical turbine

booster pumps. One pump meets average day demands, while the addition of the second pump meets maximum day demands. The third pump is considered standby. Booster Pump Station #2 supplies all of the water that serves all of the Town of Tonopah water pressure zones, excluding the Airport System (TPU 2015).

The Bryan Pump Station is located on Bryan Street near University Avenue. This pump station includes two centrifugal type pumps, with one pump meeting maximum day demands, and the second pump serving as standby. The Bryan Pump Station supplies all of the water that serves the Cody pressure zone (TPU 2015).

The California Pump Station is located at the intersection of California and Air Force Road. This pump station includes two centrifugal type pumps, with one pump meeting maximum day demands, and the second pump serving as standby. The California Pump Station supplies all of the water that serves the Sandia/Butler and Ketten pressure zones (TPU 2015).

The existing Town of Tonopah water system utilizes nine active water tanks: Booster #2 (0.105 Mgal); Rye Patch 1 (0.20 Mgal); Rye Patch 2 (0.10 Mgal); Ararat 1 – West (0.50 Mgal); Ararat 2 – East (0.50 Mgal); Cody 1 – West (0.50 Mgal); Cody 2 – East (0.50 Mgal); Sandia (0.20 Mgal); and Butler (1.0 Mgal). The Booster #2 tank is served by wells. Rye Patch 1 and Rye Patch 2 tanks are served by wells and Booster Pump Station #2. Ararat 1 – West and Ararat 2 – East are served by the Booster Pump Station #2. Cody 1 – West and Cody 2 – East are served by the Bryan Pump Station. The Sandia and Butler tanks are served by the California Pump Station (TPU 2015).

There are approximately 150,750 feet of transmission mains, and approximately 204,640 feet of distribution pipes, totaling approximately 355,390 feet or approximately 67 miles (TPU 2015).

### *Wastewater Service*

#### Esmeralda County

Public wastewater collection services are provided by Esmeralda County Public Works within the unincorporated Town of Goldfield, approximately 29 miles south of the Project Area. There are approximately 309 customers, with a variable active connection status as there are seasonal residents. The wastewater treatment plant is currently permitted for 0.45 million gpd, with a current intake of approximately 20,000 gpd, and a maximum capacity of 45,000 gpd (Holt 2015).

#### Nye County (Census Tract 9602)

Public wastewater collection services are provided by TPU within the Town of Tonopah, as well as the Tonopah Apartments and the Tonopah Housing Facility in Esmeralda County. There are approximately 1,700 total service connections, with 1,200 to 1,300 active connections. The wastewater treatment plant is currently permitted for 0.499 million gpd, with a current intake of 300,000 gpd, and a maximum capacity of 600,000 gpd. The rural portion of Census Tract 9602 is served by septic systems (Eason 2015).

## *Solid Waste Disposal*

### Esmeralda County

There are no local ordinances mandating garbage collection services in Esmeralda County. In Goldfield, the county contracts with Ken Seeley Disposal Service to pick up garbage at public buildings, parks, and other facilities. Ken Seeley Disposal Service also contracts with a few individual businesses in Goldfield for garbage pick-up.

Esmeralda County operates one Class II landfill located in Goldfield, and two drop box facilities in Silver Peak and Fish Lake Valley. The total permitted volume of the Goldfield landfill is 406,465 yds<sup>3</sup> and the total disposal capacity is 282,815 yds<sup>3</sup>. The estimated closure date is 2097 (NDEP 2015).

### Nye County (Census Tract 9602)

There are no municipal solid waste collection services in Census Tract 9602 of Nye County. Nye County operates one Class II landfill in Census Tract 9602 located approximately four miles east of the Town of Tonopah. This landfill serves the communities of Gabbs, Tonopah, and the Yomba Shoshone Tribe (Nye County 2011). The total permitted volume of the Tonopah landfill is 67,750 yds<sup>3</sup> and the total disposal capacity is 54,200 yds<sup>3</sup>. The estimated closure date is 2017 (NDEP 2015).

## *Electricity*

### Esmeralda County

There are two electric companies that provide electricity within Esmeralda County: Valley Electric Association, which serves the Dyer/Fish Lake Valley area and Sierra Pacific Power Company (dba NV Energy), which serves the remainder of Esmeralda County (Esmeralda County 2015).

### Nye County (Census Tract 9602)

NV Energy provides electrical service within Census Tract 9602 of Nye County.

## *Library*

### Esmeralda County

There are three libraries in Esmeralda County: the Silver Peak Library; the Fish Lake Library; and the Goldfield Public Library. The Silver Peak Library and Fish Lake Library are open three days per week, and the Goldfield Public Library is open five days per week. All three libraries offer resources such as books, magazines, old newspapers, tax forms, and various online resources (Cooperative Libraries Automated Network [CLAN] 2015).

### Nye County (Census Tract 9602)

The Tonopah Library District is located in Tonopah within Census Tract 9602. This library is open five days per week, and offers resources such as books, magazines, old newspapers, tax forms, and various online resources (CLAN 2015).

#### *County Government Administrative Facilities*

### Esmeralda County

Administrative services for Esmeralda County are located at the Esmeralda County Court House in Goldfield, Nevada. The following offices are located in the Esmeralda County Court House: Assessor; Auditor/Recorder; Clerk/Treasurer; County Commissioners; District Attorney; Emergency Management; and the Esmeralda County Justice Court (Esmeralda County 2015).

### Nye County (Census Tract 9602)

Most administrative services for Nye County are located in both Tonopah and Pahrump. Services in each location are provided by the following: County Manager and Board of County Commissioners; County Assessor; County Clerk; Human Resources; County Recorder; and the County Treasurer. The Finance Director provides services from the County Office in Tonopah (Nye County 2015).

#### 3.15.1.5 Public Finance

The primary governing bodies in Esmeralda County are the Board of County Commissioners and the ECSD. The three-member Board of County Commissioners is each elected to an overlapping four-year term. The County Commissioners oversee most County operations, including public works, roads, solid waste, economic development, grants and grant administration, and emergency services. The County Commissioners have overall financial authority and approval of all budget expenditures (Boland 2015). The ECSD serves Esmeralda County and is governed by an appointed Board of Trustees with five officers (ECSD 2015).

Local government and school finances in Nevada involve locally derived and state-shared revenues. Locally derived finances consist primarily of ad valorem property taxes on real and personal property and the net proceeds of mines located within Esmeralda County. The state-shared revenues include sales, motor vehicle, fuel, and gaming tax revenues. Current fiscal conditions of the two primary entities, Esmeralda County and the ECSD, are summarized below.

#### *Esmeralda County*

Esmeralda County's fiscal structure reflects a dependence on ad valorem taxes and necessary responses to the combined influences of a small population base, large physical service territory, and substantial year-to-year variances in mining-related tax base and tax revenues. However, the total taxable value depends more heavily on real and personal property assessments than net proceeds from mining (Table 3.15-10). For example, Esmeralda County's net proceeds from mining declined dramatically by approximately \$3.8 million (approximately 97 percent) between fiscal years 2010/2011 to 2011/2012, and then increased drastically by approximately five million dollars (4,000 percent) by 2012/2013. Between fiscal years 2010/2011 to 2011/2012, the

total taxable value decreased by approximately \$8.8 million, or approximately 15 percent. By 2012/2013, the total taxable value had increased by approximately \$13 million, or approximately 27 percent.

**Table 3.15-10: Trends in Net Proceeds and Property Assessments**

Fiscal Year	Net Proceeds from Mining	Real and Personal Property Assessments	Total Taxable Value
2005/2006	500,000	35,413,695	35,913,695
2006/2007	1,000,000	41,058,344	42,058,344
2007/2008	3,000,000	43,208,930	46,208,930
2008/2009	5,000,000	49,506,674	54,506,674
2009/2010	4,290,000	53,933,955	58,223,955
2010/2011	3,963,220	53,409,652	57,372,872
2011/2012	122,000	48,464,553	48,586,553
2012/2013	5,127,220	56,671,005	61,798,225
2013/2014	18,366,606	55,630,265	73,996,871
2014/2015	19,908,192	60,122,367	80,030,559

Source: NDE, Division of Assessment Standards (DOAS) 2005; DOAS 2006; DOAS 2007; DOAS 2008; DOAS 2009; DOAS 2010; DOAS 2011; Division of Local Government Services (DLGS) 2012; DLGS 2013; DLGS 2014

Intergovernmental revenues account for most of Esmeralda County’s remaining revenues. Such revenues totaled approximately \$2.7 million for fiscal years 2012/2013, then decreased to approximately \$2.5 million for fiscal year 2013/2014 (Table 3.15-11). Intergovernmental revenues include the Basic County-City Relief Tax, the Supplemental County-City Relief Tax, motor vehicle property taxes, and fuel taxes. The Basic County-City Relief Tax and Supplemental County-City Relief Tax are statewide sales and use taxes enacted to provide property tax relief. The Basic County-City Relief Tax is a state-mandated, county-imposed sales and use tax returned to the county of origin, while revenues derived from the Supplemental County-City Relief Tax sales and use tax are pooled and distributed according to a specific formula.

Esmeralda County expenditures fluctuated from the 2012/2013 fiscal year to the 2013/2014 fiscal year. Total expenditures decreased by approximately \$725,000, while the following specific functions experienced increases: Judicial; Public Safety; Public Works; Sanitation; and Community Support (Table 3.15-11).

**Table 3.15-11: Esmeralda County Revenues and Expenditures**

Revenues/Expenditures	2012/2013	2013/2014
<b>Revenues</b>		
Property Taxes	\$2,144,908.55	\$1,776,494.07
Other Taxes	\$3,903.50	\$6,708.20
Licenses and Permits	\$11,850.00	\$9,864.00
Intergovernmental	\$2,659,545.50	\$2,448,775.40
Charges for Services	\$360,999.78	\$248,306.07
Fines and Forfeits	\$669,561.83	\$479,805.39
Miscellaneous	\$210,965.02	\$238,654.65
Enterprise	\$518,993.41	\$358,541.28
Transfer In	\$324,474.52	\$137,359.56
<b>Total Revenue</b>	<b>\$6,905,202.11</b>	<b>\$5,704,508.62</b>

<b>Expenditures</b>		
General Government	\$2,536,925.36	\$2,015,670.29
Judicial	\$375,885.42	\$456,355.76
Public Safety	\$1,373,152.79	\$1,555,207.44
Public Works	\$678,523.17	\$892,711.61
Sanitation	\$86,662.70	\$110,799.21
Health	\$9,684.94	\$8,121.14
Welfare	\$62,663.61	\$45,975.12
Culture and Recreation	\$114,421.30	\$112,954.11
Community Support	\$55,710.84	\$64,141.20
Intergovernmental Expenditures	\$381,440.06	\$11,304.00
Utility Enterprises Contingency	\$462,924.17	\$296,178.24
Transfer Out	\$327,374.52	\$170,696.77
<b>Total Expenditures</b>	<b>\$6,465,368.88</b>	<b>\$5,740,114.89</b>

Source: Esmeralda County Auditor/Recorder 2013, 2014

The overlapping ad valorem tax rates of all entities imposed on property in Esmeralda County is \$2.0995 per \$100 of assessed valuation (Table 3.15-12), and is approximately 74 percent of the total levies in the County. Esmeralda County School District's levy is \$0.75, a uniform statewide levy for public education. There are no individual levies for the towns of Goldfield and Silver Peak.

**Table 3.15-12: Tax Rates in Esmeralda County for 2014/2015**

<b>Local Government Taxing Unit</b>	<b>Tax Rate</b>
Esmeralda County	\$2.0995
Esmeralda County School District	\$0.7500
Goldfield Town	\$0.0000
Silver Peak Town	\$0.0000
<b>Total</b>	<b>\$2.8495</b>

Source: DLGS 2014

*Esmeralda County School District*

Historically, the ECSD has derived virtually all its revenue from locally generated ad valorem property taxes levied on real and personal property and the net proceeds of mining. Local sources provide approximately half of ECSD's revenue (approximately 53 percent) (Table 3.15-13). Undistributed expenditures were the highest expenditure source for the ECSD, resulting in approximately 56 percent of the total expenditures. Regular programs, the second highest expenditure, totaled approximately 36 percent of the total expenditures.

**Table 3.15-13: Esmeralda County School District Revenues and Expenditures**

<b>Revenues/Expenditures</b>	<b>2013/2014</b>
<b>Revenues</b>	
Local Sources	\$1,193,810
State Sources	\$899,995
Federal Sources	\$142,062
<b>Total Revenue</b>	<b>\$2,235,867</b>
<b>Expenditures</b>	
Regular Programs	\$760,234

<b>Revenues/Expenditures</b>	<b>2013/2014</b>
Special Programs	\$128,741
Other Instructional Programs	\$26,458
Co-curricular and extra-curricular activities	\$23,412
Undistributed Expenditures	\$1,171,265
<b>Total Expenditures</b>	<b>\$2,110,110</b>

Source: ECSD 2014

### 3.15.1.6 Social Conditions

This section generally describes existing social conditions in the vicinity of the Project Area, in Esmeralda and Nye Counties. The Project Area is located approximately one mile east of the Town of Tonopah in Nye County, which is the community most likely to be impacted by the Project. The Town of Tonopah is a close-knit community with many residents being deeply involved in the community. An individual may be a business person, serve as an elected official, or be an appointed member of a board or committee, and also serve as a volunteer for a fire district, emergency medical response team, or other civic organization.

The Town of Tonopah serves as a stopover between Reno and Las Vegas, Nevada, and attracts highway travelers and tourists from other areas in and outside Nevada. The Town also experiences periodic influxes of mine workers and employees associated with the Crescent Dunes Solar Energy Project or other short-term construction projects. The Town strives to maintain its small town, rural character while valuing the industries and projects that would bring more jobs to the community residents. One concern that has been raised is that workers associated with the mines or other large projects only stay in town during their shifts, and do not bring their families to town to live to contribute to the viability of the community for the long term (Eason 2015).

### 3.15.2 **Effects of the Proposed Action**

Mining and production activities associated with the Proposed Action would occur for approximately two years. The entire life of the Project is anticipated to last approximately 13 years, from pre-stripping to post-closure monitoring. The peak number of workers is expected to be approximately 100. Activities associated with the Proposed Action could affect the local community in the following ways: impacts to the labor force and unemployment rates; impacts to personal income; impacts to population; impacts to housing; impacts to community facilities and services, including public safety, schools, health care and social services, utilities, recreational facilities, and county administrative functions; and fiscal conditions in Esmeralda and Nye Counties.

The majority of the mine workers, if not all 100 of the workers, are anticipated to reside in the Town of Tonopah during the life of the Project. According to the Town Manager, there is adequate available housing to accommodate all of the workers, and utilities and other services would not require improvements to the existing service levels (Eason 2015). Although the 100 workers would bring additional revenue to the Town of Tonopah, it is not likely that many indirect jobs would be created from workers bringing their families to the Town of Tonopah. Most workers are anticipated to reside in Town of Tonopah during their shifts, but leave to be with their families in other locations on their time off (Eason 2015).

Table 3.15-14 shows the fiscal effects of the Proposed Action, which are projected through 2019. The majority of the taxes generated by the Project would be derived from net proceeds of minerals taxes, payroll taxes, and sale taxes. Under the Proposed Action, local economic, governmental and social resources would be positively impacted by an increase in employment, salaries, operating costs, sales and use taxes, property taxes, and net proceeds taxes. The property taxes and the sales and use taxes are collected by the counties. The net proceeds of minerals tax is collected by the state and a portion is distributed to the county where the minerals are mined, which is Esmeralda County.

**Table 3.15-14: Proposed Action Annual Operating Costs and Taxes Generated**

Year	Annual Operating Costs	Sales Taxes and Use Taxes	Property Taxes	Net Proceeds of Minerals Taxes	Payroll Taxes
2015	--	\$2,490,000	\$105,000	--	\$894,000
2016	\$36,209,000	\$784,000	\$105,000	\$756,000	\$3,432,000
2017	\$34,461,000	\$601,000	\$105,000	\$3,556,000	\$3,182,000
2018	\$1,430,000	\$24,000	\$105,000	\$420,000	\$934,000
2019	\$1,882,000	\$32,000	\$105,000	--	\$934,000

Source: MDA 2015

### 3.15.3 Effects of the Powerline Alternative

Under the Powerline Alternative, the maximum number of workers at the Project would not change; however, there would be a small influx of additional workers associated with the construction of the powerline, which would bring additional revenue into the area. These impacts would be minor and temporary, but similar to the nature of the impacts under the Proposed Action. Potential indirect beneficial impacts could occur with the possibility of bringing more development to the area with the extension of power.

### 3.15.4 Effects of the On-Site Water Alternative

Under the On-Site Water Alternative, the maximum number of workers at the Project would not change from those outlined under the Proposed Action; therefore, the impacts to socioeconomics under this alternative would be the same as under the Proposed Action.

### 3.15.5 Effects of the Knapp Avenue Access Only Alternative

Under the Knapp Avenue Access Only Alternative, the maximum number of workers at the Project would not change from those outlined under the Proposed Action; therefore, the impacts to socioeconomics under this alternative would be the same as under the Proposed Action.

### 3.15.6 Effects of the No Action Alternative

Under the No Action Alternative, there would be up to five workers on site at any one time. These workers would most likely stay in temporary housing facilities, such as hotels, in the Town of Tonopah during exploration activities. These workers would temporarily bring in additional revenue to the Town of Tonopah, but at a much smaller scale than the Proposed Action. In addition, these temporary workers would most likely not impact public services or utilities. Therefore, impacts to socioeconomics under the No Action Alternative would be similar

to, but proportionally less than under the Proposed Action. In addition, none of the tax revenue outlined in Table 3.15-14 would be generated and collected under the No Action Alternative.

### 3.16 Soils

#### 3.16.1 Affected Environment

According to the Natural Resource Conservation Service (NRCS), seven soil associations were identified within the Project Area: Advokay-Blacktop-Itme association; Downeyville-Pintwater-Rock outcrop association; Lathrop-Leo association; Terlco-Advokay-Downeyville association; Stewval-Downeyville-Rock outcrop association; Unsel-Wardenot-Izo association; and Slickens. The NRCS database identified approximately 1.3 acres of Water; however, there is no water in the Project Area, so these acres have been included in the Advokay-Blacktop-Itme association. Soil associations within the Project Area are shown on Figure 3.16.1 and listed in Table 3.16-1.

**Table 3.16-1: Soil Associations within the Project Area**

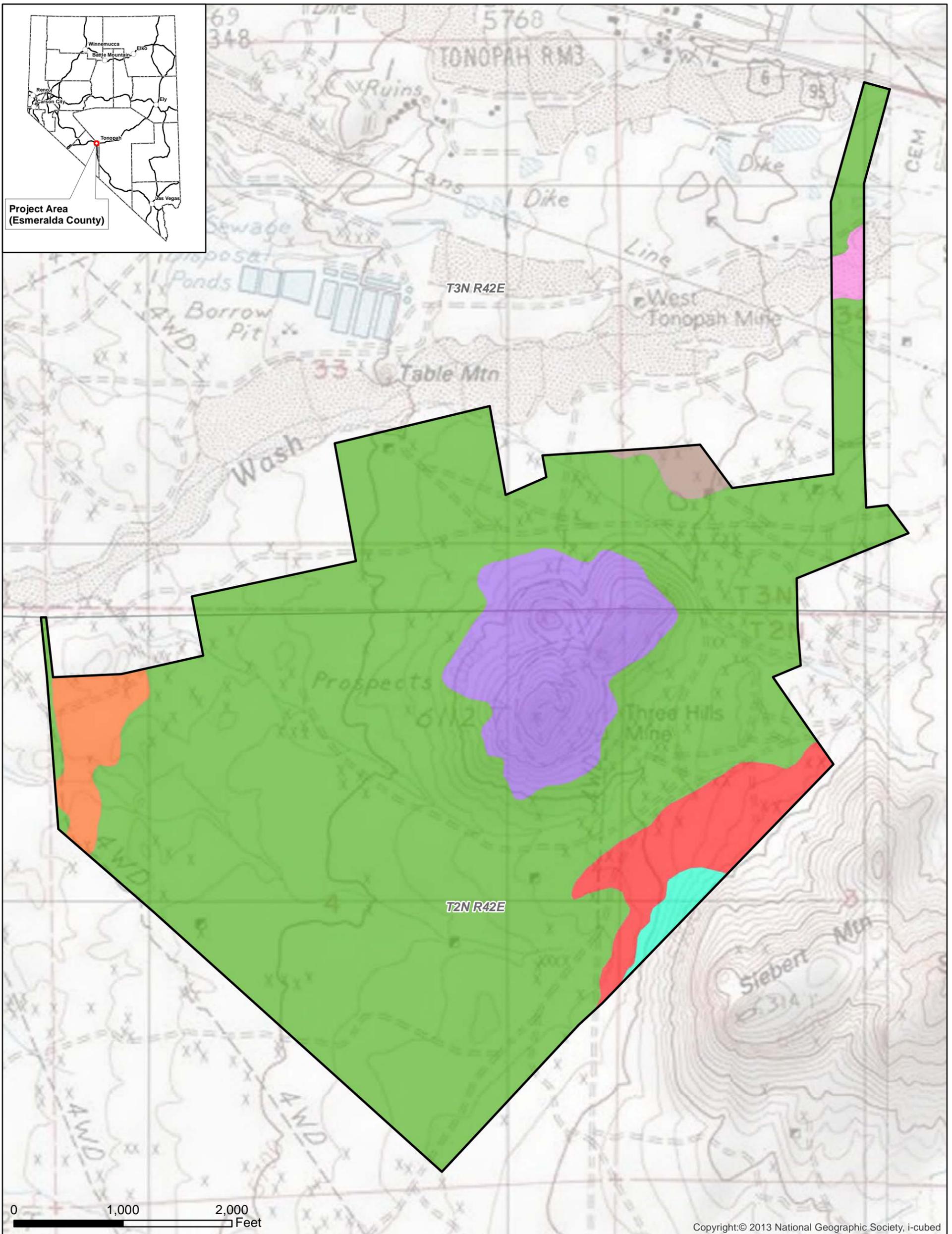
Association	Soil Series	Range in Depth to Restrictive Feature	Landscape position/ % Slope	Profile Soil Texture	Permeability	Erosion Hazard by Water	Erosion Hazard by Wind
Advokay-Blacktop-Itme Association (221)	Advokay	4 – 14 inches (paralithic bedrock)	Summits and shoulders of rock pediments and hills; 2 to 8%	Gravelly coarse sandy loam	Moderately slow	Slight	Severe
	Blacktop	4 – 10 inches (lithic bedrock)	Side slopes of rock pediments and hills; 8 to 30%	Very gravelly fine sandy loam	Moderate	Moderate	Slight
	Itme	More than 80 inches	Inset fans; 2 to 8%	Gravelly loamy sand, dry	Very rapid	Slight	Severe
Downeyville-Pintwater-Rock outcrop association (360)	Downeyville	4 – 14 inches (lithic bedrock)	Stable areas on hillsides and mountainsides; 15 to 50%	Very gravelly fine sandy loam	Moderate	Slight	Slight

Association	Soil Series	Range in Depth to Restrictive Feature	Landscape position/ % Slope	Profile Soil Texture	Permeability	Erosion Hazard by Water	Erosion Hazard by Wind
	Pintwater	10 – 20 inches (lithic bedrock)	Hillsides, mountainsides; 15 to 50%	Very cobbly fine sandy loam	Moderately rapid	Severe	Slight
	Rock outcrop	--	Summits and shoulders of upper side slopes of hills and mountains	--	--	--	--
Lathrop-Leo association (270)	Lathrop	More than 80 inches	Fan piedmont remnants, fan remnants; 4 to 15%	Very stony fine sandy loam	Moderately slow	Slight	Slight
	Leo	More than 80 inches	Inset fans; 4 to 15%	Very gravelly sandy loam	Rapid	Slight	Slight
Terlco-Advokay-Downeyville association (191)	Terlco	More than 80 inches	Side slopes and shoulders of fan piedmonts; 4 to 30%	Extremely stony sandy loam	Slow	Slight	Slight
	Advokay	4 to 14 (paralithic bedrock)	Rock pediment remnants; 4 to 15%	Gravelly coarse sandy loam	Moderately slow	Slight	Severe
	Downeyville	4 to 14 (lithic bedrock)	Summits and shoulders of rock pediment remnants; 15 to 50%	Very stony fine sandy loam	Moderate	Slight	Slight
Stewal-Downeyville-Rock outcrop association (230)	Stewval	4 to 14 (lithic bedrock)	Mainly north-facing hillsides and mountainsides; 2 to 4%	Very stony fine sandy loam	High	Low	Low

Association	Soil Series	Range in Depth to Restrictive Feature	Landscape position/ % Slope	Profile Soil Texture	Permeability	Erosion Hazard by Water	Erosion Hazard by Wind
	Downeyville	4 to 14 (lithic bedrock)	Lower part of south-facing hillsides and mountainsides; 15 to 50%	Very stony fine sandy loam	Moderate	Slight	Slight
	Rock outcrop	--	Shoulders of side slopes of mountains	--	--	--	--
Unsel-Warnot-Izo association (101)	Unsel	More than 80 inches	Summits and upper side slopes of fan piedmont remnants; 2 to 8%	Gravelly fine sandy loam	Moderately slow	Slight	Severe
	Wardenot	More than 80 inches	Inset fans; 2 to 8%	Gravelly loamy sand	Rapid	Slight	Severe
	Izo	More than 80 inches	Drainageways; 2 to 4%	Gravelly sand	Rapid	Severe	Moderate
Slickens (902)	Slickens	--	Drainageways	--	--	--	--

Source: NRCS 1991

The Advokay-Blacktop-Itme association is primarily comprised of 35 percent Advokay gravelly coarse sandy loam, 30 percent Blacktop very gravelly fine sandy loam, and 20 percent Itme gravelly loamy sand. This association occurs in approximately 582 acres of the Project Area. The Advokay series consists of very shallow, well-drained soils that formed in residuum and colluvium derived from coarse grained tuff, rhyolite, and granite and related rocks. The Blacktop series consists of very shallow, somewhat excessively drained soils that formed in residuum and colluviums derived from volcanic rock. The Itme series consists of very deep, excessively drained soils that formed in alluvium derived dominantly from granitic rock (NRCS 1991).



**Explanation**

- Project Area
- 101, Unsel-Wardenot-Izo association
- 191, Terlco-Advokay-Downeyville association
- 221, Advokay-Blacktop-Itme association
- 230, Stewval-Downeyville-Rock outcrop association
- 270, Lathrop-Leo association
- 360, Downeyville-Pintwater-Rock outcrop association
- 902, Slickens



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**BUREAU OF LAND MANAGEMENT**

**THREE HILLS MINE PROJECT**

**Soil Types within the Project Area**

Figure 3.16.1

10/07/2015

The Downeyville-Pintwater-Rock outcrop association is primarily comprised of 40 percent Downeyville very gravelly fine sandy loam, 30 percent Pintwater very cobbly fine sandy loam, and 15 percent rock outcrop. This association occurs in approximately 69 acres of the Project Area. The Downeyville series consists of very shallow, well-drained soils that formed in residuum and colluviums derived from andesite, rhyolite, and metavolcanic rock. The Pintwater series consists of shallow, well-drained soils that formed in residuum and colluvium derived from rhyolite, tuff, and related rocks (NRCS 1991).

The Lathrop-Leo association is primarily comprised of 50 percent Lathrop very stony fine sandy loam and 35 percent Leo very gravelly sandy loam. This association occurs in approximately 36 acres of the Project Area. The Lathrop series consists of very deep, well-drained soils that formed in alluvium derived from various kinds of rock. The Leo series consists of very deep, excessively drained soils that formed in alluvium from tuffaceous rock and small amounts of basalt and related rock (NRCS 1991).

The Terlco-Advokay-Downeyville association is primarily comprised of 50 percent Terlco extremely stony sandy loam, 20 percent Advokay gravelly coarse sandy loam, and 15 percent Downeyville very stony fine sandy loam. This association occurs in approximately 19 acres of the Project Area. The Terlco series consists of very deep, well-drained soils that formed in alluvium derived from andesitic, rhyolitic, and granitic rock (NRCS 1991).

The Stewval-Downeyville-Rock outcrop association is primarily comprised of 35 percent Stewval very stony fine sandy loam, 35 percent Downeyville very stony fine sandy loam, and 15 percent rock outcrop. This association occurs in approximately six acres of the Project Area. The Stewval series consists of very shallow, well-drained soils that formed in residuum and colluviums derived from rhyolite and related rock (NRCS 1991).

The Unsel-Wardenot-Izo association is comprised of 45 percent Unsel gravelly fine sandy loam, 30 percent Wardenot gravelly sandy loam, and 15 percent Izo gravelly sand. This association occurs in approximately six acres of the Project Area. The Unsel series consists of very deep, well-drained soils that formed in mixed alluvium. The Wardenot series consists of very deep, excessively drained soils that formed in alluvium derived from various kinds of rock. The Izo series consists of very deep, excessively drained soils that formed in alluvium derived from mixed igneous and sedimentary rock (NRCS 1991).

### **3.16.2 Effects of the Proposed Action**

Approximately 459 acres of soils would be disturbed by activities associated with the Proposed Action. The potential surface disturbance to each soil type that can be specifically quantified associated with the Proposed Action is shown in Table 3.16-2. The ten acres of proposed exploration could occur anywhere in the Project Area, and within any of the soil types listed. The open pit would not be reclaimed at the end of the Project life, resulting in a permanent disturbance to approximately 75 acres of soils.

**Table 3.16-2: Potential Surface Disturbance to Each Soil Series within the Project Area**

Soil Series	Acres in Project Area	Percent of Soil/Unit in Project Area	Acres Impacted by Proposed Action <sup>1</sup>	Percent Impacted by the Proposed Action
Advokay-Blacktop-Itme association	582	81	375	82
Downeyville-Pintwater-Rock outcrop association	69	9	65	14
Lathrop-Leo association	36	5	3	1
Terlco-Advokay-Downeyville association	19	3	1	0
Stewval-Downeyville-Rock outcrop association	6	1	0	0
Unsel-Wardenot-Izo association	6	1	4	1
Slickens	4	0	0	0

<sup>1</sup> – These values do not include 11 acres of Project surface disturbance that is associated with the exploration and the road intersection in the NDOT ROW.

Direct impacts from surface disturbing activities would primarily include potential increases in soil erosion due to wind and storm water runoff. BMPs would be used to limit erosion and reduce sediment in precipitation runoff from proposed Project facilities and disturbed areas during construction, operations, and initial stages of reclamation. Silt fences, sediment traps, or other BMPs would be used to prevent migration of eroded material until reclaimed slopes and exposed surfaces have demonstrated erosional stability. In addition, surface grading, engineered surface water diversion channels, and temporary sediment control facilities would be used to reduce erosion and sedimentation.

Revegetation of disturbance areas would be conducted as soon as practicable to reduce the potential for wind and water erosion, minimize impacts to soils and vegetation, and help prevent the spread of invasive and non-native species in disturbance areas. Concurrent reclamation would be conducted to the extent practical to accelerate revegetation of disturbance areas. Sediment and erosion control measures and revegetated areas would be inspected periodically to ensure long-term erosion control and successful reclamation.

### 3.16.3 Effects of the Powerline Alternative

Under the Powerline Alternative, development and operation of the Project would disturb approximately 539 acres of soils, including additional disturbance to the Advokay-Blacktop-Itme association and the Lathrop-Leo association. Approximately 75 acres associated with the open pit would not be reclaimed. Similar to the Proposed Action, the ACEPMs and reclamation would minimize this alternative’s effect on soils. However, impacts to soils under the Powerline Alternative would be greater than the Proposed Action.

### **3.16.4 Effects of the On-Site Water Alternative**

Under the On-Site Water Alternative, development and operation of the Project would disturb approximately 453 acres of soils, of which 75 acres associated with the open pit would not be reclaimed. Therefore, impacts to soils under the On-Site Water Alternative would be similar but less as under the Proposed Action.

### **3.16.5 Effects of the Knapp Avenue Access Only Alternative**

Under the Knapp Avenue Access Only Alternative, development and operation of the Project would disturb approximately 458 acres of soils over the life of the Project, of which 75 acres associated with the open pit would not be reclaimed, which is one acre less than the Proposed Action. Therefore, impacts to soils under this alternative would be similar to the impacts under the Proposed Action.

### **3.16.6 Effects of the No Action Alternative**

Under the No Action Alternative, up to five acres of surface disturbance could occur within the Project Area under Notice-level exploration activities. Reclamation of surface disturbance would gradually eliminate potential impacts to soils. Impacts to soils under the No Action Alternative would be similar, but proportionally less than the Proposed Action (approximately five acres of surface disturbance versus approximately 384 acres associated with the Proposed Action).

## **3.17 Special Status Species**

### **3.17.1 Affected Environment**

The BLM's policy for management of special status species is in the BLM Manual Section 6840 (BLM 2008b). Special status species include the following:

- Federally Threatened or Endangered Species: Any species the USFWS has listed as an endangered or threatened species under the ESA, throughout all or a significant portion of its range;
- Proposed Threatened or Endangered Species: Any species the USFWS has proposed for listing as a federally endangered or threatened species under the ESA;
- Candidate Species: Plant and animal taxa under consideration for possible listing as threatened or endangered under the ESA;
- Delisted species: Any species in the five years following their delisting;
- BLM Sensitive Species: Native species found on BLM-administered lands for which the BLM has the capability to significantly affect the conservation status of the species through management, and either: 1) there is information a species has undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or distinct population segment of the species is at risk across all or a significant portion of the species range; or 2) the species depends on ecological refugia or

specialized or unique habitats on BLM-administered lands, and there is evidence that such areas are threatened with alteration such that continued viability of the species in that area would be at risk (BLM 2008b); and

- State of Nevada Listed Species: State-protected animals that have been determined to meet BLM's Manual 6840 policy definition.

To further support the preparation of this EA, the USFWS, the NNHP, and the NDOW were contacted to obtain a list of threatened and endangered and sensitive species with the potential to occur within and surrounding the Project Area. In addition, evaluations of the most recent BLM Sensitive Species List and Special Status Species lists for the BMD were conducted to determine if any species had the potential to occur within and surrounding the Project Area (Enviroscientists 2014). The special status wildlife and plant species that occurred within and surrounding the Project Area are discussed further below.

#### *Federally Listed Wildlife Species*

The NDOW reported there were no federally listed or Candidate species within the vicinity of the Project Area based on a database search; however, the Endangered California condor has been directly observed within the vicinity of the Project Area (NDOW 2014). The NNHP reported habitat may be available within and/or near the Project Area for the BLM sensitive golden eagle (NNHP 2014). The USFWS reported no critical habitat occurs in the Project Area (USFWS 2014). In addition, Enviroscientists' biological surveys did not detect any federally listed species (Enviroscientists 2014).

#### *BLM Sensitive Wildlife Species*

##### Raptors (including Golden Eagles)

The NDOW has noted the following sensitive raptor species may utilize habitat within and surrounding the Project Area: northern goshawk; Swainson's hawk; and golden eagle (NDOW 2014). No northern goshawk or Swainson's hawk nests were identified during the 2013 or 2014 aerial surveys.

In 2013, JBR performed an aerial raptor survey within a one-mile buffer survey area and an aerial golden eagle survey within a ten-mile buffer survey area. During the 2013 aerial raptor surveys, JBR identified five unoccupied golden eagle nests within the one-mile buffer survey area, and three occupied and three unoccupied golden eagle nests were recorded within the ten-mile buffer survey area. One of the occupied nests contained two chicks of unknown age (JBR 2013). On May 23, 2014, another aerial survey was conducted by WRC to assess the current status of the nests identified by JBR during the 2013 surveys. During the aerial raptor survey conducted on May 23, 2014, six golden eagle nests were observed within the one-mile buffer survey area. These nests included four unoccupied golden eagle nests and two occupied nests. Within the ten-mile buffer area, ten unoccupied golden eagle nests and three occupied golden eagle nests were documented. There were no raptor or golden eagle nests documented within the Project Area.

## Bats

Acoustic bat surveys were conducted July 5 through July 10, 2014, within and surrounding the Project Area. A total of 38 potential bat features were identified during pre-field analysis and were surveyed. Of the 38 potential bat features, 12 features (two adits and ten shafts) were identified as providing suitable bat roosting habitat and one feature was determined to provide a water source for bat species (Horse Spring); however, bats were recorded at the two adits and only four of the shafts. Seven BLM sensitive bat species were detected during acoustic surveys: big brown bat (*Eptesicus fuscus*); Brazilian free-tailed bat (*Tadarida brasiliensis*); little brown bat (*Myotis lucifugus*); California myotis (*Myotis californicus*); western pipistrelle (*Parastrellus hesperus*); pallid bat (*Antrozous pallidus*); and western small-footed myotis (*Myotis ciliolabrum*). Only two adits and two shafts were documented within the Project Area.

Internal surveys of adits 17 and 18 were conducted. No bats were observed in either adit. However, a small ring of Townsend's big-eared bat (*Corynorhinus townsendii*) guano was found, approximately 15 feet from the mine face of adit 17, along with staining, which indicates this adit has been used by a maternity colony of Townsend's big-eared bat. Pallid bat guano was also observed at both adits 17 and 18.

In addition to the mine features and Horse Spring, bat roosting habitat within and surrounding the Project Area also includes rock outcrops and old buildings. A single cinder block building at UTM 0477673E, 4214057N, was searched for evidence of roosting bats (e.g., urine staining, scat, insect parts), but none was observed. The building is relatively modern and has smooth cinder block walls and little space between the metal roof and ceiling. Wood rat scat, rock doves, garbage, and graffiti were present in the building.

The buildings at the Lambertucci-Roma Ranch are constructed from a variety of materials, including wood, stone, and tin. All of these buildings could potentially provide bat roosting habitat. No acoustic bat surveys or intensive searches of the buildings for bats or sign (e.g., urine staining, scat, and insect parts) were conducted because these buildings were in a location that had a posted no trespassing signage.

## Other Mammals

Potentially suitable habitat for the dark kangaroo mouse is present in the Project Area south of the proposed open pit. However, the habitat requirements for the dark kangaroo mouse are broad, and the presence of potential habitat does not specifically indicate this species is present.

## *Special Status Plant Species*

The NNHP reported three at risk plant species within a five kilometer (approximately 3.1 miles) radius around the Project Area: Eastwood milkweed (*Asclepias eastwoodiana*), a BLM sensitive species; Clokey pincushion (*Coryphantha vivipara* var. *rosea*), a NNHP watch species; and Tonopah pincushion (*Sclerocactus nyensis*), a BLM sensitive species. Neither of the two BLM sensitive plant species reported by the NNHP as occurring within or surrounding the Project Area was observed during plant surveys. One BLM sensitive plant species, sand cholla, was identified at two locations outside of the Project Area. One sand cholla cactus was observed north of the Project Area, directly northwest of the fence surrounding the waste water treatment

facility. The second occurrence was on a southern aspect of the Brougher Mountain. The second occurrence was very small in stature, approximately two inches tall, and did not produce any flowers or fruits. The first sand cholla occurrence was much larger and more mature than the second. Flower buds were present and some pads exhibited multiple buds, a typical response to herbivory. No other sand cholla occurrences were observed near these two individuals.

Three additional cactus species were observed within and surrounding the Project Area: 1) plains prickly pear (*Opuntia polyacantha*); 2) redspined fishhook cactus (*Sclerocactus polyancistrus*); and 3) Wiggins' cholla (*Cylindropuntia echinocarpa*). Plains prickly pear cactus and Wiggins' cholla were present sporadically within and surrounding the Project Area, while the distribution of redspined fishhook cactus was concentrated in the area east of the Project Area. Many of the Wiggins' cholla observed during the surveys were completely desiccated and dead. In Nevada, all cacti, yuccas, and Christmas trees are fully protected (NRS 527.050 to 527.070), and removal must be done in accordance with NRS 527.100.

### **3.17.2 Effects of the Proposed Action**

#### *BLM Sensitive Wildlife Species*

##### Golden Eagles

There were no golden eagle nests observed within the Project Area during 2014 aerial surveys. Approximately 459 acres of foraging habitat would be removed by Project activities. Individual golden eagles foraging in the Project Area would likely leave the immediate area due to the loss of foraging habitat or anthropogenic activity such as noise or other human disturbances, since there is undisturbed and suitable habitat within the vicinity of the Project Area. This may result in the temporary spatial redistribution of individuals or change in habitat-use patterns. With the exception of 75 acres associated with the open pit, all disturbed land would be reclaimed. The creation of the open pit would result in new nesting habitat. Annual monitoring of raptor nesting sites in the ten-mile survey buffer would occur throughout the life of the Project, and would continue for at least one year after the Project is complete, as outlined in Section 7.1 of the BBCS (Appendix A). In addition, ACEPMs identified in Section 2.1.11 would reduce impacts to golden eagles that would result from mining activities. No long-term effects are anticipated to golden eagles.

##### Bats

Under the Proposed Action, bats would be directly impacted by the loss of identified adits 17 and 18 currently used as roosting and maternity sites. This impact would be minimized by the installation of bat exclusions and closure of the two adits, as described in the BBCS (Appendix A). Difficulties in navigating through the exclusion material would cause the bats to be displaced into the surrounding landscape and seek alternate roost sites (Sherwin et al. 2009). Potential mortality related to the exclusion of bats is unknown. Case studies have shown that bats displaced during the appropriate season have been successfully absorbed into adjacent colonies and roosting sites which provide adequate room and meet the habitat needs of the displaced bats (Sherwin et al. 2003; Sherwin et al. 2009).

Bat foraging habitat would also be impacted by surface disturbing activities associated with the Proposed Action. Direct impacts to bats would include the removal or alteration of

approximately 459 acres of potential foraging habitat equaling approximately 64 percent of the Project Area. With the exception of 75 acres associated with the open pit, all disturbed land would be reclaimed. The open pit would constitute a long-term loss of foraging habitat. However, the additional cliff-like features created along the pit wall may serve as day roost sites but would not likely provide additional hibernation, maternity, or bachelor roost sites. Impacts to bat habitat would be reduced through the implementation of the ACEPMs outlined in Section 2.1.11.

### **3.17.3 Effects of the Powerline Alternative**

Under the Powerline Alternative, development and operation of the Project would remove or disturb approximately 539 acres of golden eagle foraging habitat, of which 75 acres associated with the open pit would not be reclaimed, and would create additional breeding and nesting habitat for golden eagles. Similar to the Proposed Action, the ACEPMs and reclamation would minimize this alternative's effect on golden eagles and their habitat. However, impacts to golden eagles under the Powerline Alternative would be greater than the Proposed Action. In addition, under the Powerline Alternative, an approximately 2.4-mile long powerline would be constructed, which would add perching opportunities for golden eagles. Under this alternative, bat habitat provided by the two adits would be permanently lost, similar to the Proposed Action.

### **3.17.4 Effects of the On-Site Water Alternative**

Under the On-Site Water Alternative, development and operation of the Project would remove or disturb approximately 453 acres of golden eagle foraging habitat, of which 75 acres associated with the open pit would not be reclaimed, and would create additional breeding and nesting habitat for golden eagles. Similar to the Proposed Action, the ACEPMs and reclamation would minimize this alternative's effect on golden eagles and their habitat. Impacts to golden eagles under the On-Site Water Alternative would be similar, but less than the Proposed Action. Under this alternative, bat habitat provided by the two adits would be permanently lost, similar to the Proposed Action.

### **3.17.5 Effects of the Knapp Avenue Access Only Alternative**

Under the Knapp Avenue Access Only Alternative, development and operation of the Project would remove or disturb approximately 458 acres of golden eagle foraging habitat, of which 75 acres associated with the open pit would not be reclaimed, and would create additional breeding and nesting habitat for golden eagles. Similar to the Proposed Action, the ACEPMs and reclamation would minimize this alternative's effect on golden eagles. Impacts to migratory birds under the Knapp Avenue Access Only Alternative would be similar to impacts associated with the Proposed Action. Under this alternative, bat habitat provided by the two adits would be permanently lost, similar to the Proposed Action.

### **3.17.6 Effects of the No Action Alternative**

Under the No Action Alternative, up to five acres of surface disturbance could occur within the Project Area under Notice-level exploration activities. This could result in the temporary loss of approximately five acres of golden eagle foraging habitat. Reclamation of surface disturbance would gradually eliminate potential impacts to golden eagles. Impacts to golden eagles under the No Action Alternative would be similar, but proportionally less than the Proposed Action

(approximately five acres of temporary foraging habitat loss versus approximately 384 acres associated with the Proposed Action). There would be no loss of bat habitat provided by the two adults under this alternative.

### **3.18 Transportation/Traffic**

#### **3.18.1 Affected Environment**

##### **3.18.1.1 Existing Roadway System**

The existing roadway network is comprised mostly of two-lane roads, with speed limits of 25 miles per hour (mph). These roadways are Knapp Avenue and Paymaster Canyon Road. Also included in the roadway system are US Highway 6 and US Highway 95, which are four-lane roads within the Town of Tonopah. A secondary access consists of the South Access Road from US Highway 95 to Paymaster Canyon Road. The transportation network is shown on Figure 3.18.1.

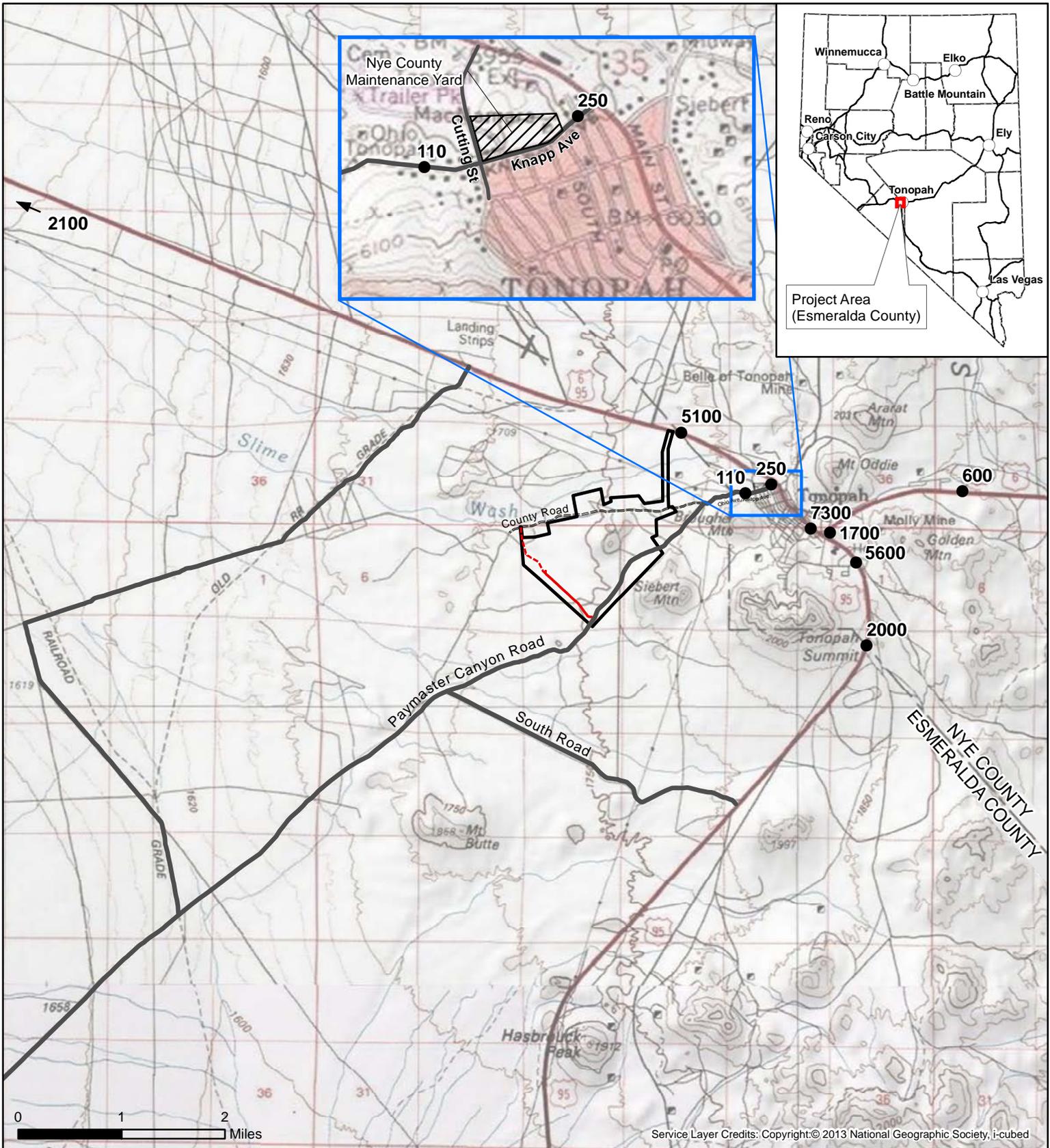
##### **3.18.1.2 Study Intersections**

Four intersections have been identified as potentially impacted by the proposed Project, and therefore, designated as study intersections and shown on Figure 3.18.1. These intersections are as follows:

1. US Highway 95 and Knapp Avenue;
2. US Highway 6 and US Highway 95;
3. US Highway 95 and South Access Road; and
4. South Access Road and Paymaster Canyon Road.

##### **3.18.1.3 Existing Traffic Volumes**

Current counts were obtained in November 2014 for Knapp Avenue. Traffic counts for US Highway 6 and US Highway 95 were measured in 2013 by NDOT (NDOT 2015a, 2015b). Traffic volumes on US Highway 6/95 north of the Town of Tonopah, but south of the rest area were 2,100 Annual Average Daily Traffic (AADT) vehicle trips. This volume increases to 5,100 AADT vehicle trips at approximately the Nye/Esmeralda County Line (Figure 3.18.1). This traffic volume includes regional north-south travel on US Highway 95, as well as local traffic between the Town of Tonopah and southern Big Smokey Valley (i.e., solar plant construction). In the Town of Tonopah, the traffic volumes on the same roadway increases to 7,300 AADT vehicle trips. This is interpreted to result from in Town of Tonopah local traffic. The US Highways divide in the Town of Tonopah with US Highway 95 continuing south and US Highway 6 heading to the east. Traffic volumes on US Highway 6 immediately east of the junction with US Highway 95 were 1,700 AADT vehicle trips. Further to the east on US Highway 6 the AADT vehicle trips decreased to 600, which included regional traffic, as well as some local traffic. Continuing south on US Highway 95, but still within the Town of Tonopah, were 5,600 AADT vehicle trips. South of the Town of Tonopah and the Nye/Esmeralda County Line, the traffic volumes were 2,000 AADT vehicle trips. Therefore, the regional north-south traffic on US Highway was approximately 2,000 AADT vehicle trips, with a few hundred AADT vehicle trips on US Highway 6 heading east. The local traffic on US Highway 95 and



**Explanation**

- Project Area
- Nye Co. Maintenance Yard
- Existing Access Routes
- County Road
- Proposed Project Access Road
- Proposed County Road Bypass
- Annual Average Daily Traffic

  
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**THREE HILLS MINE PROJECT**

**Transportation Network  
and Traffic Counts**

Figure 3.18.1

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US Highway 6 varies from approximately 1,500 to 5,000 AADT vehicle trips. Using the traffic count point south of the Town of Tonopah at the county line as the reference point for the north-south traffic on US Highway 95, the traffic was approximately 77 percent cars and 23 percent trucks and approximately 75 percent of the trucks were semi- or multi-trailer (NDOT 2015c).

These vehicle percentages would not be accurate when considering the traffic in and around the Town of Tonopah, where the increased traffic volumes would likely be attributable to cars and light-duty trucks. Based on these data, there were approximately 500 AADT vehicle trips by trucks on the US Highway 95 corridor.

Traffic volumes on Knapp Avenue were measured east of Summit Street/Mill Avenue and west of Jackson Street (Figure 3.18.1). The volumes east of Summit Street/Mill Avenue were 250 average daily traffic (ADT) vehicle trips. The volumes west of Jackson Street were 110 ADT vehicle trips. The difference in trips was likely due to a majority of the 250 ADT vehicle trips being to and from the Nye County Maintenance Station (Figure 3.18.1).

### **3.18.2 Effects of the Proposed Action**

For this traffic analysis, it is assumed each contractor and employee would travel to the Project in a separate vehicle. For the construction phase it is then assumed there would be up to 200 trips per day (100 round trips) during the weekdays and 40 trips per day on the weekend days. Vehicles during the construction phase would be a combination of cars and light-duty trucks. For the operations phase it is then assumed there would be up to 110 trips per day (55 round trips) during the weekdays and 90 trips per day (45 round trips) during the weekend days.

During the Project construction phase, it is assumed there would be an average of one tractor-trailer delivery per day for the four- to five-month construction period. During Project operations, there would be regular deliveries of hazardous materials and supplies. Table 2.1-4 lists the volume and shipment frequency of fuels and reagents used during Project operations, which total approximately 25 trips per week. These deliveries would likely be as follows: approximately one trip per day each from sodium cyanide and lime; approximately four trips per for LNG; two trips per week for the diesel fuel; and one trip per week for the other deliveries. On any given day there could be as few as two deliveries or as many as nine deliveries.

Trip assignments for the construction workers, as well as the mine operations employees, are based on all these individuals residing in the Town of Tonopah. Therefore, they would utilize the local streets through town to Knapp Avenue as their access to the Project.

The Town of Tonopah is located approximately midway between Reno and Las Vegas, Nevada on US Highway 95; therefore, supplies for the construction and operation of the Project could be expected to come from either direction. There are three likely exceptions to the location of the supplies. The liquid cyanide would likely be delivered from the manufacturing facility in Winnemucca, Nevada, and travel on US Highway 95 south to the Project. The liner for the heap leach pad and pond construction would likely be delivered from a manufacturer in Fernley, Nevada, and travel on US Highway 95A and US Highway 95 south to the Project. Lime could be delivered from northeastern Nevada and travel south and west on US Highway 6 to the Project or could be delivered from the Las Vegas area and travel north on US Highway 95.

During the construction phase of the Project, truck traffic would increase by approximately one trip per day, which would be an approximate 0.2 percent increase in truck traffic on US Highway 95. Project traffic during construction would be approximately 200 vehicle trips, which would be an approximate four percent increase in traffic in the Town of Tonopah on US Highway 95. In addition, these 200 vehicle trips (40 vehicle trips on the weekend) would likely use Knapp Avenue to access the Project. This would be an 80 percent increase (16 percent increase on the weekend) in traffic between US Highway 95 and the Nye County Maintenance Yard, and a 180 percent increase (36 percent increase on the weekend) in traffic between the Nye County Maintenance Yard and the county line.

During the operational phase of the Project, truck traffic would increase by approximately 25 trips per week, which would be an approximate 0.7 percent increase in truck traffic on US Highway 95. Project traffic during the operation would be approximately 110 vehicle trips, which would be an approximate two percent increase in traffic in the Town of Tonopah on US Highway 95. In addition, these 110 vehicle trips (90 vehicle trips on the weekend) would likely use Knapp Avenue to access the Project. This would be a 44 percent increase (36 percent increase on the weekend) in traffic between US Highway 95 and the Nye County Maintenance Yard, and a 100 percent increase (82 percent increase on the weekend) in traffic between the Nye County Maintenance Yard and the county line.

Effect of the Project traffic to the conditions of the access roads to the Project in both Esmeralda County and Nye County would be covered by maintenance agreements requiring WKM to maintain and repair the roads.

### **3.18.3 Effects of the Powerline Alternative**

Under the Powerline Alternative the Project would be constructed and operated in the same manner as the Proposed Action. There would be essentially no difference in the amount and flow of Project-related traffic.

### **3.18.4 Effects of the On-Site Water Alternative**

Under the On-Site Water Alternative the Project would be constructed and operated in the same manner as the Proposed Action. There would be essentially no difference in the amount and flow of Project-related traffic.

### **3.18.5 Effects of the Knapp Avenue Access Only Alternative**

Under the Knapp Avenue Access Only Alternative the Project would be constructed and operated in the same manner as the Proposed Action. However, none of the construction or operational truck delivery traffic would use the South Access Road. As a result, in addition to the employee and contractor vehicle traffic on Knapp Avenue, there would be approximately one truck per day on Knapp Avenue during the construction phase and approximately two to nine trucks per day on Knapp Avenue during the operational phase of the Project.

### **3.18.6 Effects of the No Action Alternative**

Under the No Action Alternative, the Project would not be constructed and operated. None of the associated traffic would occur. Under this alternative there could be a few vehicles per day using the road system to access the Project Area for exploration-related activities.

## **3.19 Vegetation**

### **3.19.1 Affected Environment**

Based on the results of the field vegetation survey (Enviroscientists 2014), the following two vegetation communities were identified in the Project Area: Inter-Mountain Basins Mixed Salt Desert Scrub (approximately 717 acres); and Inter-Mountain Basins Playa (approximately five acres) (Figure 3.19.1). The surface soils within this landscape are composed primarily of compacted, fine, white silt. The majority of the Project Area is composed of the Inter-Mountain Basins Mixed Salt Desert Scrub community, and is dominated by shadscale saltbush and bud sagebrush with fluctuations of secondary plant species in different landscapes.

### **3.19.2 Effects of the Proposed Action**

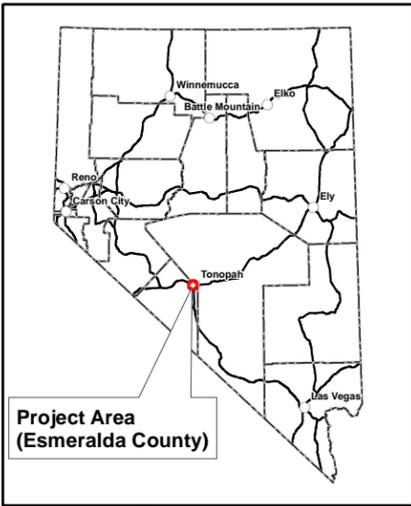
Surface disturbing activities associated with the Proposed Action would remove approximately 459 acres of the Inter-Mountain Basins Mixed Salt Desert Scrub community, with less than one acre of the Inter-Mountain Basins Playa community removed. Approximately 75 acres associated with the open pit would be left unreclaimed. The remaining 384 acres of surface disturbance would be recontoured and reseeded with a BLM-approved weed-free seed mix at the end of the Project life, or concurrently when practicable. The area surrounding the Project contains similar vegetation, so no vegetation community would be completely removed.

### **3.19.3 Effects of the Powerline Alternative**

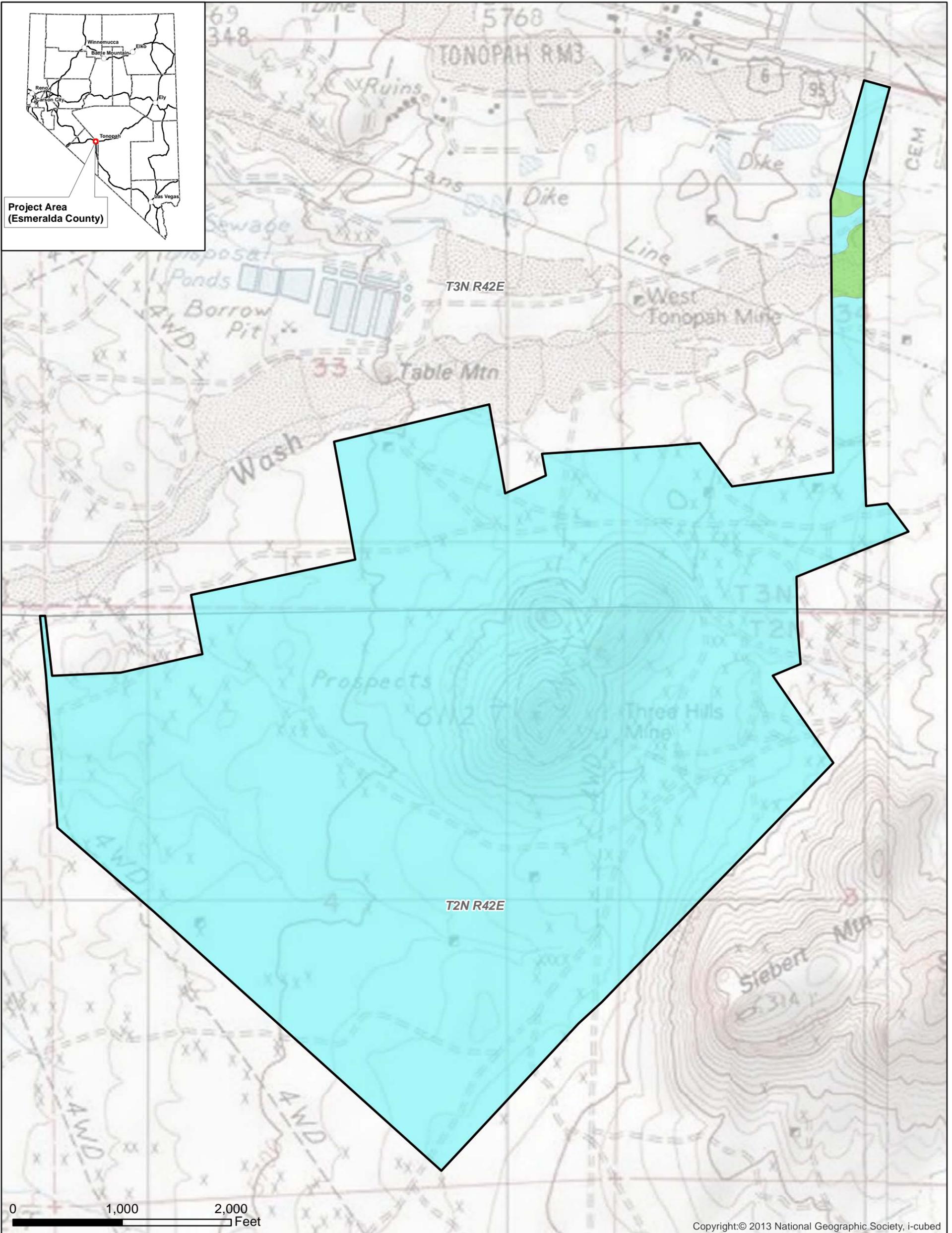
Under the Powerline Alternative, development and operation of the Project would disturb approximately 539 acres of vegetation, primarily associated with the Inter-Mountain Basins Mixed Salt Desert Scrub community. Approximately 75 acres associated with the open pit would not be reclaimed. Similar to the Proposed Action, the ACEPMS and reclamation would minimize this alternative's effect on vegetation. However, impacts to vegetation under the Powerline Alternative would be greater than the Proposed Action.

### **3.19.4 Effects of the On-Site Water Alternative**

Under the On-Site Water Alternative, development and operation of the Project would disturb approximately 453 acres of vegetation, of which 75 acres associated with the open pit would not be reclaimed. Therefore, impacts to vegetation under the On-Site Water Alternative would be similar but less than under the Proposed Action.



**Project Area  
(Esmeralda County)**



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**Explanation**

- Project Area
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Playa



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**THREE HILLS MINE PROJECT**

**Vegetation Types  
within the Project Area**

Figure 3.19.1

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### **3.19.5 Effects of the Knapp Avenue Access Only Alternative**

Under the Knapp Avenue Access Only Alternative, development and operation of the Project would disturb approximately 458 acres of vegetation over the life of the Project, of which 75 acres associated with the open pit would not be reclaimed, which is one acre less than the Proposed Action. Therefore, impacts to soils under this alternative would be similar to the impacts under the Proposed Action.

### **3.19.6 Effects of the No Action Alternative**

Under the No Action Alternative, up to five acres of surface disturbance could occur within the Project Area under Notice-level exploration activities. Concurrent reclamation of surface disturbance would gradually eliminate potential impacts to vegetation. Impacts to vegetation under the No Action Alternative would be similar, but proportionally less than the Proposed Action (approximately five acres of surface disturbance versus approximately 384 acres associated with the Proposed Action).

## **3.20 Visual Resources**

### **3.20.1 Affected Environment**

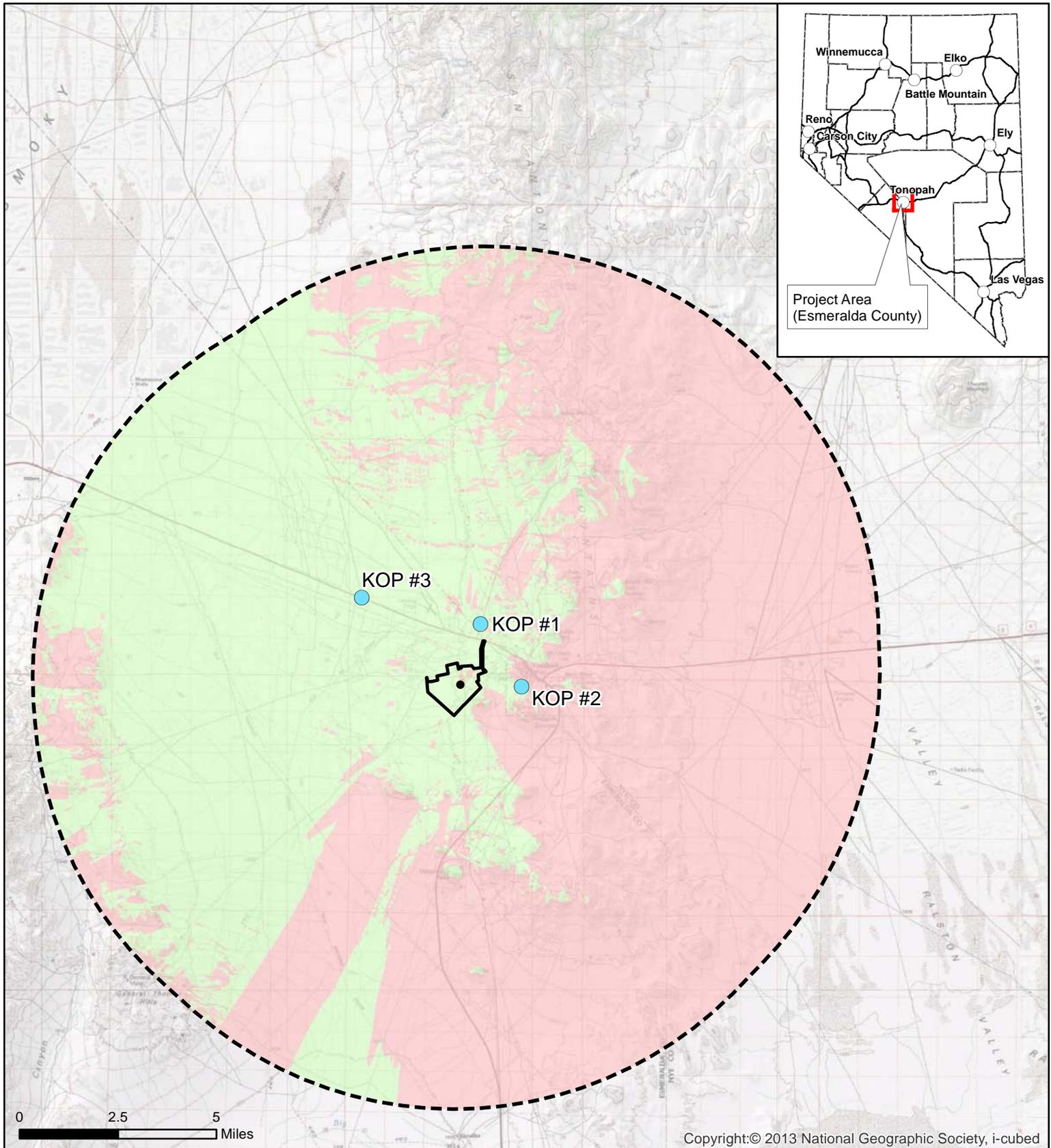
#### **3.20.1.1 Management System and Existing Conditions**

Scenic quality is a measure of the visual appeal of a parcel of land. Section 102(a)(8) of FLPMA placed an emphasis on the protection of the quality of scenic resources on public lands. Section 101(b) of the NEPA of 1969 required that measures be taken to ensure that aesthetically pleasing surroundings be retained for all Americans.

To ensure that these objectives are met, the BLM devised the Visual Resource Management (VRM) System. The VRM system provides a means to identify visual values, establish objectives for managing these values, and provide information to evaluate the visual effects of proposed projects. The inventory of visual values combines evaluations of scenic quality, sensitivity levels, and distance zones to establish visual resource inventory classes, which are “informational in nature and provide the basis for considering visual values in the land use planning process. They do not establish management direction and should not be used as a basis for constraining or limiting surface disturbing activities” (BLM 1986).

VRM classes are typically assigned to public land units through the use of the visual resource inventory classes in the BLM’s land use planning process. One of four VRM classes is assigned to each unit of public lands. The specific objectives of each VRM class are presented in Table 3.20-1.

The study area for visual resources is defined as a ten-mile viewshed of the Project, or the area from which the Project can be seen (Figure 3.20.1). The viewshed includes the Town of Tonopah, portions of the San Antonio Mountains to the east, Big Smoky Valley to the north, Lone Mountain and Weepah Hills to the west, and Alkali Lake valley to the south. Within this viewshed are a few areas from which the Project Area is not visible due to topography.



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**Explanation**

- Project Area
- Reference Point
- Study Area (10-Mile Buffer)

**Three Hills Viewshed**

- Not Visible
- Visible



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**THREE HILLS MINE PROJECT**

**Visual Viewshed Map**

Figure 3.20.1

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The Project Area is a high desert environment characterized by arid to semiarid conditions with bright sunshine, low annual precipitation, and large daily ranges in temperatures. Vegetation communities in the vicinity of the Project Area are indicative of a desert environment and include Inter-Mountain Basins Mixed Salt Desert Scrub such as Bailey’s Greasewood, Bailey’s Greasewood Desert Scrub, Shadscale Saltbrush, Black Greasewood, and Wyoming Sagebrush. Substrates are often saline and calcareous, medium- to fine-textured, alkaline soils, but include some coarser-textured soils. The vegetation is characterized by typically open to moderately dense shrubland composed of one or more *Atriplex* species (saltbush and orache).

**Table 3.20-1: BLM Visual Resource Management Classes**

Class	Description
I	The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
II	The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any change must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
III	The objective of this class is to partially retain the existing character of the landscape. The level of change to the character should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
IV	The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

Source: BLM 1986

Mining adits and shafts are abundant throughout the Project Area. All-terrain vehicle tracks traverse the majority of the Project Area but are more prevalent in the southern portion of the Project Area. Powerlines also traverse across the Project Area. Makeshift shooting ranges dot the landscape but are more common south of the Project Area. Garbage is located throughout the Project Area but is most prevalent in the eastern portion where the old Town of Tonopah dump is present. Modern dump areas were also observed. Old buildings stand in the northern portion, including abandoned buildings within the Lambertucci-Roma Ranch. Slime Wash, an area north of the waste water treatment facility, and the area surrounding the Lambertucci-Roma Ranch have both been used for mine tailings disposal from previous mining activities. In Slime Wash, the dewatering water and associated silts were directly discharged into the wash, which caused the Slime Wash drainage to fill with the silt and overflow into the surrounding uplands. In the area north of the waste water treatment facility, a series of dams were constructed in order to irrigate the fields with the dewatering water. The waste water treatment facility is located approximately 800 feet northwest of the Project Area. Inhabited houses and an apartment complex occur approximately 500 feet northeast of the Project Area along with the cemetery for the Town of Tonopah. An unofficial pet cemetery is located within the Project Area near the East dump.

The Project Area was inventoried by the BLM for the Tonopah RMP EIS (BLM 1997, Map 8) as a Visual Management Class IV area (BLM 1986). Class IV is the least restrictive of the four management classes. A management activity in this class could draw attention as a dominant feature in the landscape, but attempts should be made to minimize the contrast by repeating the form, line, color, and texture of the characteristic landscape (BLM 1986). A Visual Resource Inventory was completed in 2012 in support of the ongoing BLM BMD RMP revision. In that Inventory the area around the Proposed Action is identified as Class III. However, since the ongoing RMP has not been completed this assessment is subject to change and a final determination would be completed through the RMP revision process.

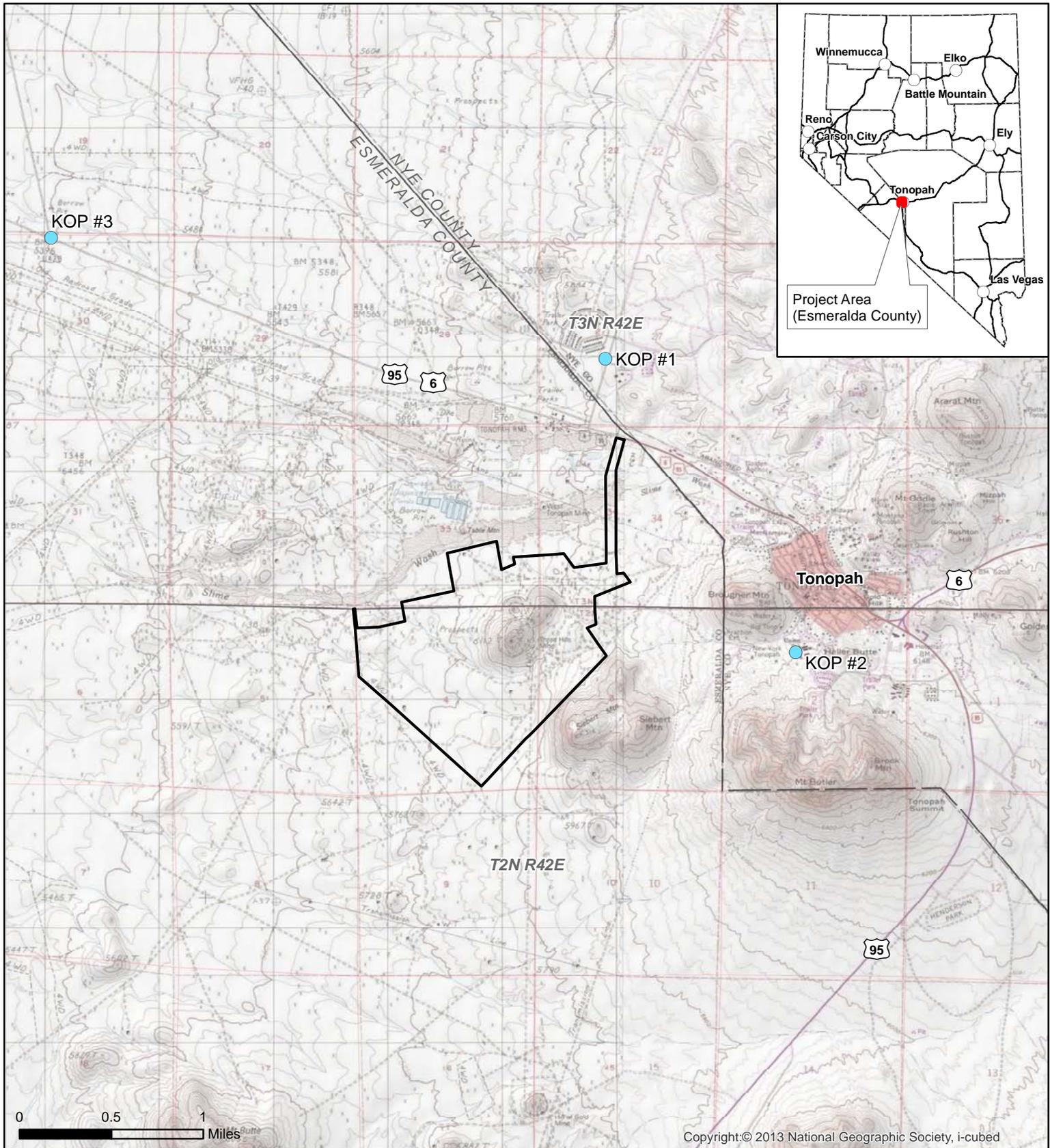
Light pollution in the Project Area is dominated by the Town of Tonopah.

### 3.20.1.2 Key Observation Point Assessment

As discussed in Section 3.20.1.1, the BLM prescribes VRM classes for all BLM administered lands, including the area of the Proposed Action and alternatives. The visual effects of the facilities and operations of the Proposed Action were evaluated with respect to conformance with the established VRM Class (IV). The analysis was initiated through a Geographic Information System (GIS) viewshed analysis using a ten-mile radius of the highest hill in the Project Area. Based on this viewshed analysis and BLM input concerning Project visibility, three key observation points (KOPs) were chosen from routinely accessible vantage points from which the Project facilities may be visible. The KOPs for the Project are shown on Figure 3.20.2.

The process used to assess visual impacts is the BLM Contrast Rating Process, as outlined in BLM Technical Manual 8432, "Visual Contrast Rating." This is a systematic process that is used to identify, describe and analyze potential visual impacts of proposed projects and activities. VRM Form 8400-4 was prepared for each KOP. This process consists of first separating the existing landscape into major features, which include land/water, vegetation and structures. Then the landscape character elements, which include form, line, color and texture, are described for each feature. As is common throughout the Great Basin Physiographic region, views are open and expansive. Potentially sensitive viewing locations (places where people travel, recreate, or reside) were examined and from these, three KOPs were identified and evaluated.

The VRM process was then conducted for the Project (Enviroscientists 2015c). The degree of contrast between the features and elements of the existing landscape and post-development landscape was then determined. The VRM class for the Project Area is Class IV, where there can be strong contrasts between the existing landscape and post-development landscape. The KOPs were selected by the BLM recreation/visual resource specialist. Contrast rating sheets that represent the No Action Alternative (existing conditions) were prepared to analyze the Proposed Action. Photosimulations were then prepared from each KOP, based on photographs taken on June 25, 2015, which show the existing conditions, maximum build out, and fully reclaimed scenario for the Proposed Action. These scenarios are described below.



- Explanation**
- Project Area
  - Key Observation Points



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**THREE HILLS MINE PROJECT**

**Key Observation Points**

Figure 3.20.2

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*KOP #1 – Near Nye County Sheriff’s Office and Radar Road*

KOP# 1 is located near the Nye County Sheriff’s Office on Radar Road, approximately 1.5 miles north of the open pit in the Project Area. This KOP is located at the point where the Project Area is visible when traveling southbound on Radar Road where the road slopes downward to the south providing a full view of the Project. Figures 3.20.3 a, b, and c show the following: 1) the view of existing conditions (No Action Alternative) (Figure 3.20.3a); 2) a photosimulation of maximum buildout (Figure 3.20.3b); and 3) a photosimulation of the fully reclaimed Project (Figure 3.20.3c).

Figure 3.20.3a shows the existing condition. The landscape consists of isolated buttes and elongated hills with steep to moderate slopes rising above flat valley floors. The hills are greenish to light brown where vegetated. Natural and excavated exposures of rock are white to ochre in color. There are bold diagonal lines in the foreground and horizontal and diagonal lines in the middleground. Powerlines, blacktop highway, gravel shoulders, buildings, and exploration drill roads are highly visible.

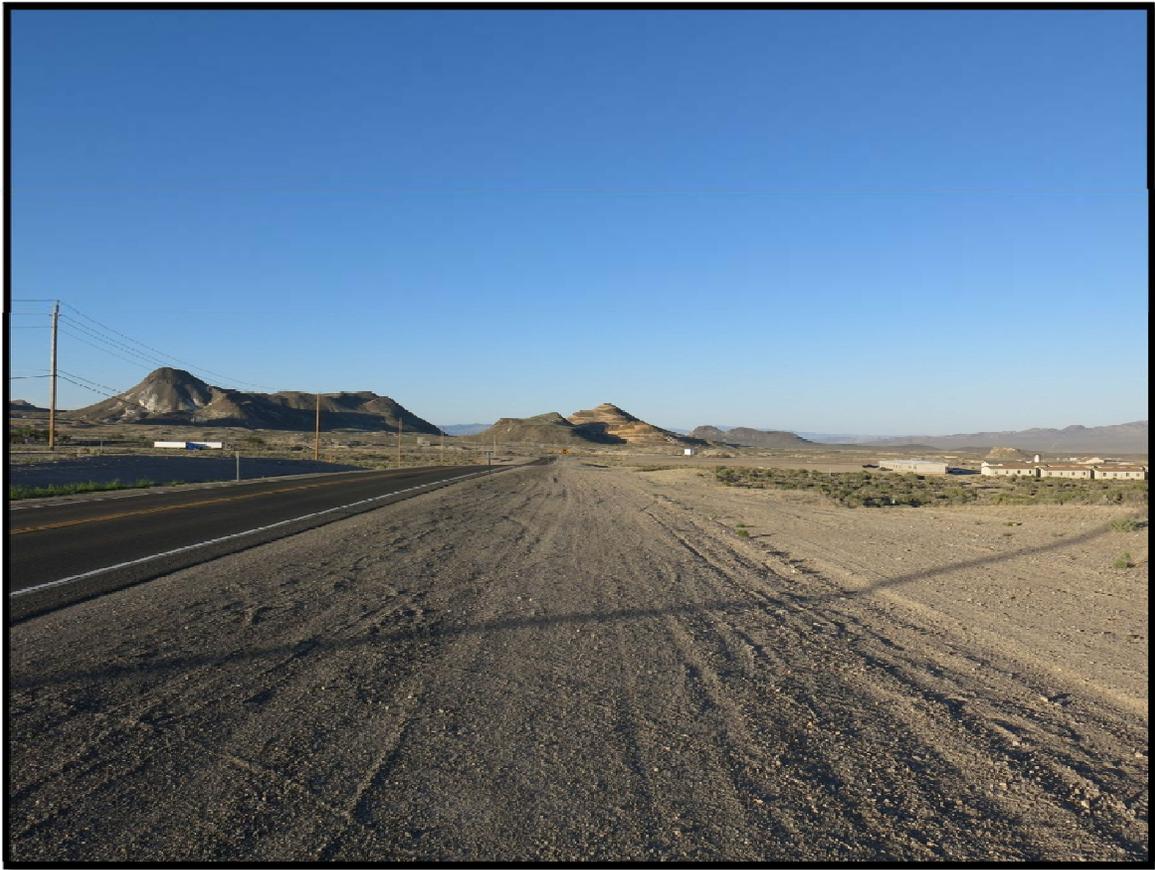
Figure 3.20.3b is a photosimulation showing full build out under the Proposed Action. The proposed waste rock facility and the open pit highwall are visible from this KOP. The shape of the waste rock facility is similar in height and shape as the adjacent hill. The contrast in color would be high.

Figure 3.20.3c is a photosimulation showing the landscape as it would appear after mining and post-reclamation under the Proposed Action. Reclamation would mimic the existing topography. The reclaimed surface would look smooth with natural, undulating surfaces. The color would be muted from that shown under full build out but would still maintain some of the brightness due to the natural color of the volcanic rock.

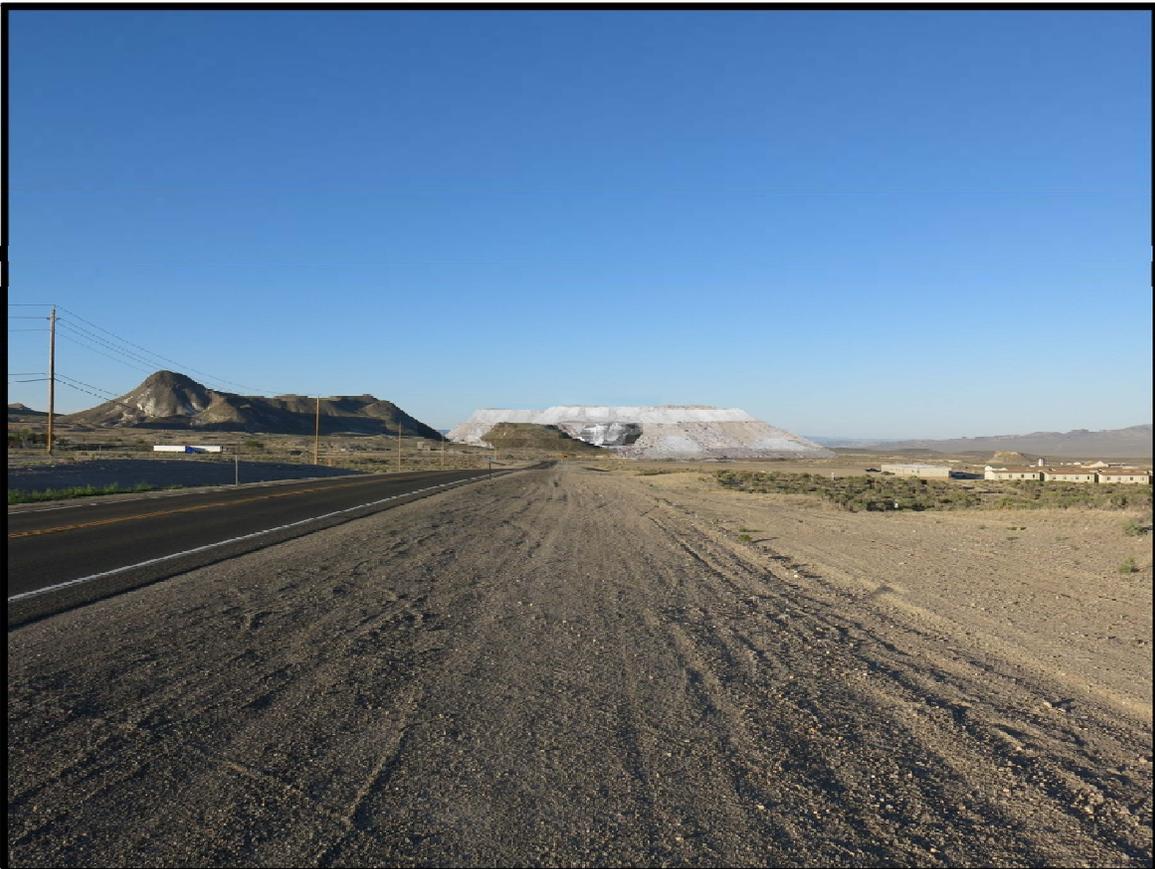
*KOP #2 – Tonopah Elementary/Middle School Back Parking Area*

KOP #2 is located at the Tonopah Elementary/Middle School approximately 1.6 miles east of the open pit in the Project Area. This KOP is located at the point where the Project Area is partially visible from the school yard between hills that separate the town from the Project. Figures 3.20.4 a, b, and c show the following: 1) the view of existing conditions (No Action Alternative) (Figure 3.20.4a); 2) a photosimulation of maximum buildout (Figure 3.20.4b); 3) and a photosimulation of the fully reclaimed Project (Figure 3.20.4c).

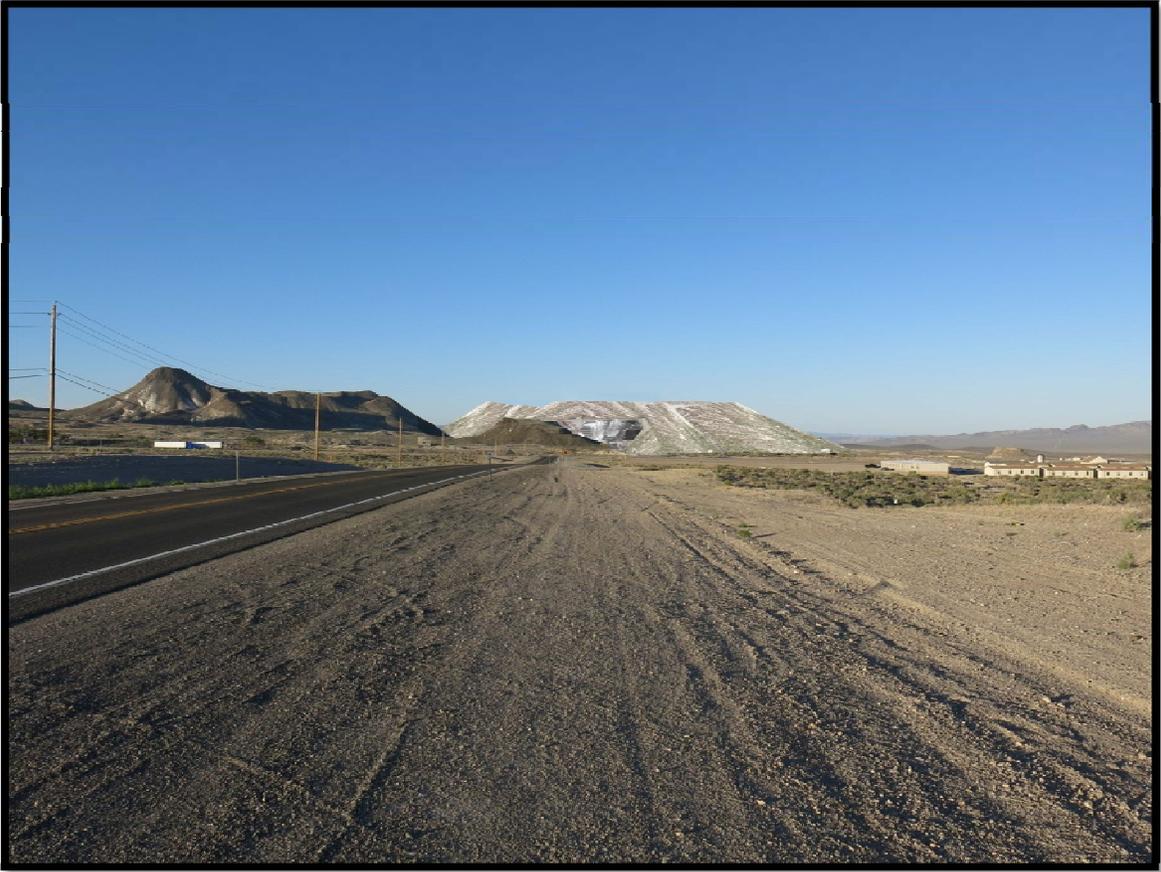
Figure 3.20.4a shows the existing conditions. The landscape consists of isolated buttes and rounded elongated hills with steep to moderate slopes rising above flat valley floors. The hill in the middle of the scene is pyramidal in shape and is crosscut with drill roads. The hills in the background are light mauve/tan to blue in color. The middleground is light brown to light green where sparsely vegetated. Natural and excavated exposures of rock are white to ochre in color. There are undulating lines in the middle ground. There are bold diagonal and vertical lines in the foreground from fences and a propane tank.



**Figure 3.20.3a: KOP #1: Looking South-Southwest – Existing Condition (No Action)**



**Figure 3.20.3b: KOP #1: Looking South-Southwest – Proposed Action – Full Buildout**



**Figure 3.20.3c: KOP #1: Looking South-Southwest – Proposed Action – Reclaimed**



**Figure 3.20.4a: KOP #2: Looking West – Existing Condition (No Action)**



**Figure 3.20.4b: KOP #2: Looking West – Proposed Action – Full Buildout**



**Figure 3.20.4c: KOP #2: Looking West – Proposed Action – Reclaimed**

Figure 3.20.4b is a photosimulation showing full build out under the Proposed Action. The only facility from the Proposed Action that would show from this KOP is the back of the waste rock facility. The shape of the waste rock would mimic the natural occurring pyramidal shape but would be taller and flat on top. The color would be the same as that showing naturally in the hill to the left of the waste facility; however, it would be starker and the contrast would be high.

Figure 3.20.4c is a photosimulation showing the landscape as it would appear after mining and post-reclamation under the Proposed Action. Reclamation would mimic the existing topography. The reclaimed surface would look smooth with natural, undulating surfaces. The color would be muted from that shown under full build out but would still maintain some of the brightness due to the natural color of the volcanic rock.

### *KOP #3 – US Highway 95 Southbound at the Intersection with County Road 89 / Poleline Road*

KOP #3 is located on US Highway 95 at the intersection with Poleline Road approximately three miles northwest of the Project Area. This KOP is located at the point where the Project Area is in the observers line-of-sight for an extended period of time when driving south on US Highway 95. Figures 3.20.5 a, b, and c show the following: 1) the view of existing conditions (No Action Alternative) (Figure 3.20.5a); 2) a photosimulation of maximum buildout (Figure 3.20.5b); 3) and a photosimulation of the fully reclaimed Project (Figure 3.20.5c).

Figure 3.20.5a shows the existing conditions. The foreground shows sparsely vegetated flat valley floor. The vegetation is green and the exposed soil and rock is gray. The middleground shows a horizontal string of pyramidal hills and buttes rising from the valley floor. The hills range from brownish green to ochre in color. The background is blue sky.

Figure 3.20.5b is a photosimulation showing full build out under the Proposed Action. The waste rock facility and the heap leach facility would both be very visible from this KOP. The shapes of the proposed facilities would mimic the existing landscape; however, the color would provide a strong contrast with the surrounding area.

Figure 3.20.5c is a photosimulation showing the landscape as it would appear after mining and post-reclamation under the Proposed Action. Reclamation would mimic the existing topography. The reclaimed surface would look smooth with natural, undulating surfaces. The color would be muted from that shown under full build out but would still maintain some of the brightness due to the natural color of the volcanic rock.

### **3.20.2 Effects of the Proposed Action**

The primary visual resources issues would include the following: 1) the development of a viewshed that could be seen from multiple sites and is different than the existing viewshed; and 2) the ultimate appearance of the Project at full reclamation.

The results of the contrast rating assessment indicate that the Proposed Action would create moderate contrast in the form, line and color between the existing landscape and the post-mining/post-reclamation background landscape. Excluding the open pit, any color contrast would be naturally mitigated after revegetation of the dump and after the vegetation matures.



**Figure 3.20.5a: KOP #3: Looking Southeast – Existing Condition (No Action)**



**Figure 3.20.5b: KOP #3: Looking Southeast – Proposed Action – Full Buildout**



**Figure 3.20.5c: KOP #3: Looking Southeast – Proposed Action – Reclaimed**

The changes, as described and viewed from the KOPs, would conform to the area's VRM Class IV designation.

### **3.20.3 Effects of the Powerline Alternative**

Under the Powerline Alternative, the Project would be developed with the same configuration as the Proposed Action. The alternative would have a powerline from the west Tonopah substation to the Project along Paymaster Canyon Road. However, this powerline would not be visible from any of the KOPs due to the local topography. Therefore, the results of the contrast rating assessment indicate the Proposed Action would create moderate contrast in the form, line and color between the existing landscape and the post-mining/post-reclamation background landscape. Excluding the open pit, any color contrast would be naturally mitigated after revegetation of the dump and after the vegetation matures. The changes, as described and viewed from the KOPs, would conform to the area's VRM Class IV designation.

### **3.20.4 Effects of the On-Site Water Alternative**

Under the On-Site Water Alternative, the Project would be developed with the same configuration as the Proposed Action. Therefore, the results of the contrast rating assessment indicate that the Proposed Action would create moderate contrast in the form, line and color between the existing landscape and the post-mining/post-reclamation background landscape. Excluding the open pit, any color contrast would be naturally mitigated after revegetation of the dump and after the vegetation matures. The changes, as described and viewed from the KOPs, would conform to the area's VRM Class IV designation.

### **3.20.5 Effects of the Knapp Avenue Access Only Alternative**

Under the Knapp Avenue Access Only Alternative, the Project would be developed with the same configuration as the Proposed Action. Therefore, the results of the contrast rating assessment indicate that the Proposed Action would be moderate contrast in the form, line and color between the existing landscape and the post-mining/post-reclamation background landscape. Excluding the open pit, any color contrast would be naturally mitigated after revegetation of the dump and after the vegetation matures. The changes, as described and viewed from the KOPs, would conform to the area's VRM Class IV designation.

### **3.20.6 Effects of the No Action Alternative**

Under the No Action Alternative, WKM would not be authorized to develop the Project as currently defined under the Proposed Action. The No Action Alternative would result from the BLM not approving the activities proposed under the Plan; however, WKM would be able to continue exploration activities as outlined in the previously submitted Notice. Refer to Section 1.3 for a discussion of the existing Notice-level activities. The area would remain available for future mineral development or for other purposes as approved by the BLM and at the time those actions are proposed they would be subject to additional site specific environmental analysis.

### **3.21 Wastes, Hazardous or Solid**

#### **3.21.1 Affected Environment**

Federal hazardous material and waste laws and regulations are applicable to hazardous substances or wastes used, stored, or generated by the Project. Applicable federal laws would include the following: the Resource Conservation and Recovery Act of 1976; Hazardous and Solid Waste Amendments; Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA; aka Superfund); Toxic Substances Control Act of 1976; Superfund Amendments and Reauthorization Act of 1986; and Safe Explosives Act of 2002. 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 a reportable quantity on public land must also be reported to the BLM. In 1999, the metal mining industry began submitting reports on release of chemicals to the EPA and appropriate state agencies, under Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986; commonly referred to as the Toxics Release Inventory (TRI) Program.

Nevada hazardous material and waste laws and regulations are applicable to hazardous substances used, stored, and generated by the Project. NAC 445A.240 requires immediate reporting of a release of a reportable quantity of a hazardous substance to the NDEP, based on Table 302.4 in 40 Part CFR Part 302.

Historically, the Town of Tonopah used the area between Brougner Mountain and Three Hills as an open dump with approximately 100 acres of trash at or near ground surface. The area of open dumping is outside the Project Area.

#### **3.21.2 Effects of the Proposed Action**

Regulated petroleum products and hazardous materials that would be used, stored, and transported in association with the Project are listed in Table 2.1-4. Under the Proposed Action, approximately 547,500 gallons per year of diesel fuel, and lesser amounts of gasoline, oil, lubricants, and other materials, would be transported to and stored and used at the Project Area during the life of the mine.

The generation of wastes and the use of hazardous materials as a result of ongoing Project activities may result in the release of these wastes or materials. Vehicles traveling on public roads in the Project Area would result in the presence of hazardous materials and wastes (e.g., fuel, antifreeze, battery acid, lead tire weights, Hg switches, or catalytic converters) for the duration of travel. These impacts would be short-term and the risk posed from these activities would exist throughout the duration of the Project. In Nevada between 1999 and 2015, there were 39 transportation incidents involving spills of diesel fuel including transit, loading, and unloading (Office of Hazardous Materials Safety 2015). Therefore, although there would be an increase in hazardous material deliveries to the Project Area, it is assumed that the probability of a transportation-related release would be low. ACEPMs outlined in Section 2.1.11 and the Project Emergency Response Plan would minimize the impacts from the Proposed Action on the environment by ensuring any release of hazardous materials would be handled and reported in accordance with applicable federal and state laws and regulations.

### **3.21.3 Effects of the Powerline Alternative**

Under the Powerline Alternative the Project would be constructed and operated in the same manner as the Proposed Action. There would be essentially no difference in the amount and types of Project-related wastes.

### **3.21.4 Effects of the On-Site Water Alternative**

Under the On-Site Water Alternative the Project would be constructed and operated in the same manner as the Proposed Action. There would be essentially no difference in the amount and types of Project-related wastes.

### **3.21.5 Effects of the Knapp Avenue Access Only Alternative**

Under the Knapp Avenue Access Only Alternative the Project would be constructed and operated in the same manner as under the Proposed Action. There would be essentially no difference in the amount and types of Project-related wastes.

### **3.21.6 Effects of the No Action Alternative**

Under the No Action Alternative, the Project would not be constructed and operated. None of the associated traffic would occur. Under this alternative there could be a few vehicles per day using the road system to access the Project Area for exploration-related activities.

## **3.22 Water Resources**

### **3.22.1 Affected Environment**

#### **3.22.1.1 Surface Water**

Surface water hydrology is described in terms of streams and springs in the area. There are no natural perennial streams or springs in the vicinity of the Project. Flow in ephemeral drainages occurs in response to storm events. The main ephemeral drainage in the Project Area is Slime Wash. To the northwest of the Project there is a small wet area downgradient of, and resulting from the Tonopah water treatment facility (Horse Spring), which supports some vegetation (Hatch 2014). There are no springs or water holes that currently or could potentially meet public water reserve (PWR) 107 criteria in, or adjacent to, the Project Area.

Surface water within the Project Area is dependent on seasonal precipitation. Precipitation data was obtained from the WRCC from two gauge stations: the Tonopah AP station located at the Tonopah airport and the Tonopah COOP station located in the Town of Tonopah. The minimum annual precipitation is zero inches, and the maximum average annual precipitation is approximately two inches (NewFields 2014).

### 3.22.1.2 Ground Water

#### *Local Ground Water Conditions*

The Project Area is located at the southwest margin of the Great Basin Carbonate Rock Aquifer System that spans western Utah to southern Idaho, and into southern California. This regional aquifer represents a semicontinuous, cross-basin, aquifer comprised of older Paleozoic carbonates and younger basin fill sediments and volcanic sequences. Flow occurs through unconsolidated and consolidated porous and fractured sediment and rock. Regional ground water recharge occurs mostly from rainfall in the upland areas northeast of Town of Tonopah, resulting in surface flows infiltrating through the coarse-grained, alluvial fan sediments into the underlying aquifer. Regional ground water flow direction is from the carbonate aquifer system into the adjacent, downgradient, volcanic-dominated regime. Ground water flows in a west-southwesterly direction with a shallow ground water gradient of approximately 0.003 foot/foot. Regional discharge occurs as evaporation from lowlands/playas, and as ground water flow to adjacent regions over 20 miles south and southwest of the Project (Hatch 2014).

Project ground water exists in the fractured and Tertiary volcanoclastic sequences that have low primary porosity and variable secondary porosity. In this type of geologic setting, ground water flow occurs primarily in faults and fractures resulting in a compartmentalized system of ground water (Hatch 2014).

A recently-installed Project monitoring well (3H-MW-1) indicates depth to ground water is approximately 850 feet below ground surface (bgs) in the Project Area (Hatch 2014). This is consistent with information from historical underground mining in the district suggesting ground water exists at approximately 750 to 850 feet below ground surface. Historical underground mining in the area encountered hydrogeologic features (e.g., faults and fracture zones) with significant storage and permeability, such as near the Rex Shaft north of the proposed Project, which produced in excess of 1,000 gpm during historical mining (Grant 1918). However, less fractured volcanoclastic rocks, such as those encountered by 3H-MW-1 appear to be less productive (Hatch 2014).

Two ground water elevations are available within the Project Area. The ground water elevation in the Rex Shaft in 1918 was approximately 4,855 feet amsl. The ground water elevation in the newly installed monitoring well 3H-MW-1 is 4,971 feet amsl.

The borehole for monitoring well 3H-MW-1 was drilled to a depth of 1,260 feet at a diameter of 8.75 inches. Four-inch diameter well casing was installed in the borehole, with an open interval from 1,178 feet below ground surface (bgs) to the bottom of the hole. During drilling, ground water was encountered in the borehole at a depth between 1,050 and 1,200 feet bgs. The subsequent static water level in the well is recorded as 850 feet bgs, indicating confined ground water conditions exist in this area (Hatch 2014).

#### *Ground Water Quality*

Ground water quality was evaluated based on the monitoring well within the Project Area (3H-MW-1). The water quality data are presented in Table 3.22-3.

**Table 3.22-3: Project Groundwater Quality Data Summary**

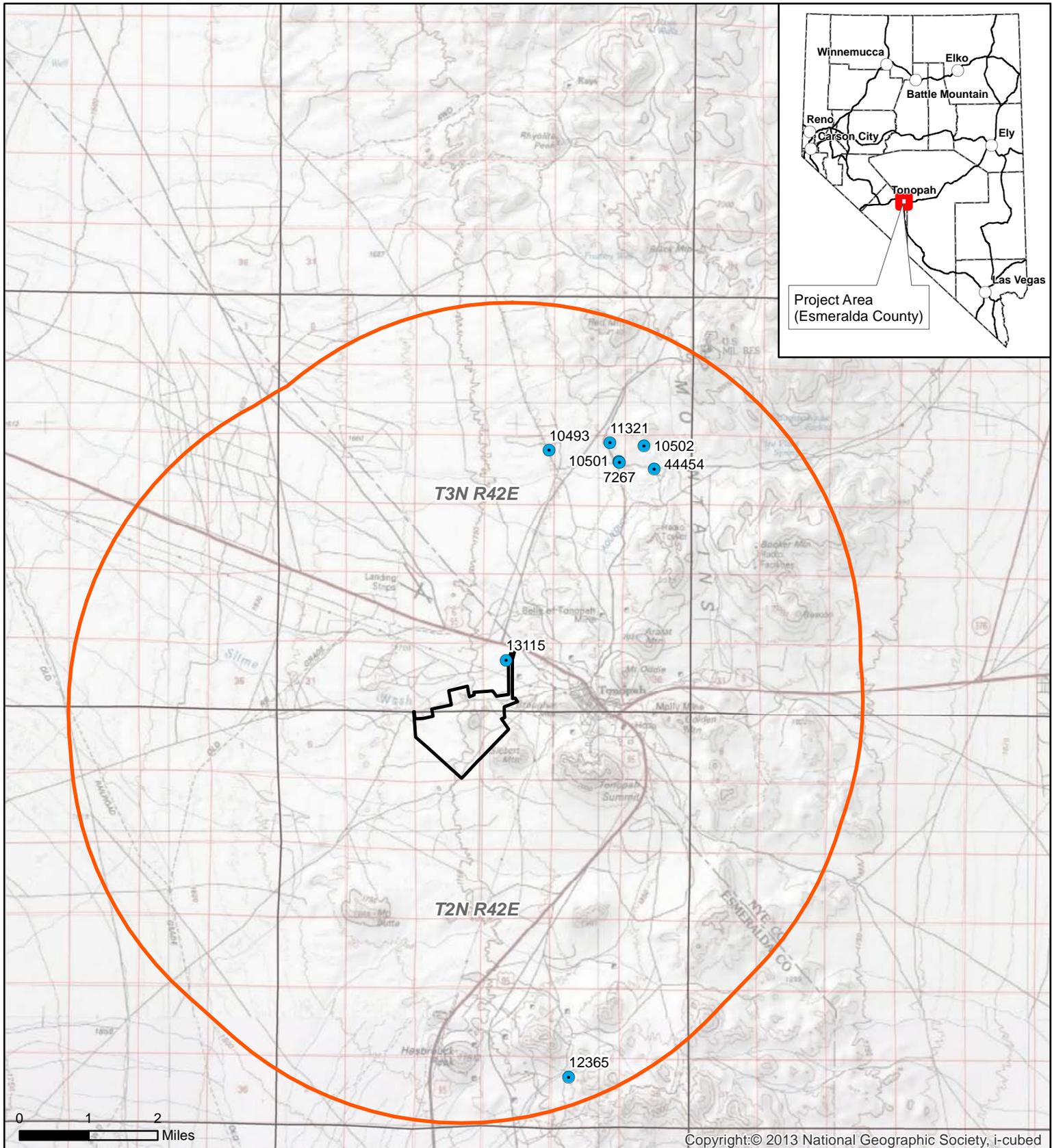
Analyte	Units <sup>1</sup>	Nevada Reference Value	3H-MW-1
pH	s.u.	6.5-8.5	8.11
Aluminum	µg/l	200	55
Antimony	µg/l	6	2.9
Arsenic	µg/l	10	<b>21</b>
Barium	µg/l	2,000	71
Beryllium	µg/l	4	<10
Bicarbonate	mg/l		130
Bismuth	µg/l		<100
Boron	µg/l		740
Cadmium	µg/l	5	<1
Calcium	mg/l		7.5
Chloride	mg/l	400	41
Chromium	µg/l	100	<5
Cobalt	µg/l		<10
Copper	µg/l	1,000	<50
Iron	µg/l	600	140
Lead	µg/l	15	<2.5
Magnesium	mg/l	150	<0.5
Manganese	mg/l	0.1	0.018
Molybdenum	µg/l		17
Nickel	µg/l	100	<10
Potassium	mg/l		1.8
Selenium	µg/l	50	<5
Silver	µg/l	100	<5
Sodium	mg/l		100
Strontium	µg/l		210
Sulfate	mg/l	500	77
TDS	mg/l	1,000	410
Thallium	µg/l	2	<1
Tin	µg/l		<100
Vanadium	µg/l		<10
Zinc	µg/l	5,000	<10

**Bold** indicates exceedance of Nevada reference standard  
1 – mg/l is milligram per liter; µg/l is microgram per liter

The recently installed monitoring well 3H-MW-1 is being used for ground water quality sampling for the Project. A water sample was collected immediately after the well was installed, developed, and air-lift tested (October 2014). No exceedences of Nevada References Values (NRVs) were observed in the sample from 3H-MW-1 with the exception of arsenic (As) (0.021 mg/l, NRV of 0.01 mg/l).

*Local Ground Water Quantity and Use*

The Project Area is located within NDWR’s Central Region Hydrographic Area. Figure 3.22.1 shows the location of the NDWR certified water rights within a five-mile radius of the Project Area. Eight certified water rights exist within a five-mile radius of the Project Area and are summarized in Table 3.22-1.



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**Explanation**

-  Project Area
-  Five-mile Buffer
-  Points of Diversion



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**BUREAU OF LAND MANAGEMENT**

**THREE HILLS MINE PROJECT**

**Certified Water Rights within Five Miles of the Project Area**

Figure 3.22.1

10/07/2015

**Table 3.22-1: Certified Water Rights within Five Miles of the Project**

Application No.	Source <sup>1</sup>	¼	Section	Township	Range	Diversion Rate (CFS)	Manner of Use	Annual Duty (AFA)
13115	STR	NW	34	03N	42E	1.00	Irrigation	40.00
10493	UG	NE	15	03N	42E	0.15	Irrigation	60.10
12365	UG	NW	35	02N	42E	0.01	Stock	3.93
11321	UG	NE	14	03N	42E	0.02	Irrigation	60.10
10501	UG	NE	14	03N	42E	0.15	Irrigation	60.10
7267	UG	NE	14	03N	42E	0.01	Commercial	7.95
10502	UG	NW	13	03N	42E	0.12	Irrigation	60.10
44454	UG	NW	13	03N	42E	0.18	Municipal	58.95

Source: Hatch 2014

1 – STR = stream; UG = underground; AFA = acre-feet per annum.

The one stock water use appears to be an ongoing activity that is providing water to livestock. The one municipal water use is by the TPU; however, this water is not currently in use. All the other underground water sources for irrigation and commercial uses appear not to be active based on an assessment of the place where the water is to be put to use (e.g. dry fields). The one stream water source for irrigation is based on obtaining water from Slime Wash, which was a flowing stream when the historic mining operations discharged their dewatering water into the drainage. The drainage is now dry and only flows in response to storm events. Currently, there is no water being used for irrigation. Therefore, the only current uses of ground water are approximately 4.5 miles northeast and 5.3 miles southeast of the Project.

#### *Tonopah Public Utilities Water System*

The Project Area lies within the Big Smoky Valley-Tonopah Flat Hydrographic Basin; however, the Project would receive water from the Town of Tonopah, which obtains water from wells located in the Ralston Valley Hydrographic Basin. The ultimate source of most of the ground water in Ralston Valley is precipitation within the drainage area of that valley. Some of the precipitation on the flanks of the mountains percolates downward to the ground water reservoir, but most of the recharge to the ground water reservoir in the valley fill results from the infiltration of runoff from the mountains. An unknown amount of recharge to the ground water reservoir in the valley fill results from underflow from the rocks of the mountains to the valley fill (Eakin 1962). The State Engineer has established the perennial yield of the basin at 6,000 AFA. The NDWR and the State Engineer provide ground water rights for the use of water in each hydrographic basin. Table 3.22-2 shows the distribution of ground water rights by manner of use within the Ralston Valley Hydrographic Basin.

**Table 3.22-2: Ground Water Rights by Manner of Use in Ralston Valley**

Manner of Use	Active Annual Duty (AFA)
Commercial	0
Construction	0
Domestic	0
Environmental	0
Industrial	7.86
Irrigation (Carey Act)	0
Irrigation (DLE)	0
Irrigation	7.16

Manner of Use	Active Annual Duty (AFA)
Mining and Milling	0
Municipal	4,121.93
Power	0
Quasi-municipal	36.19
Recreation	0
Stock Water	134.19
Storage	0
Wildlife	0
Other underground	0
<b>Total</b>	<b>4,307.33</b>

Source: NDWR 2015

Currently TPU Wells 5 through 8, 9, and 10, are able to produce up to a combined total of 1,900 gpm, or 2.736 million gpd. The TPU calculated the following water demands of TPU customers between 2008 and 2013: Average Day Demand; Maximum Day Demand; and Peak Hour Demand. The Average Day Demand is the average daily demand for water, generally taken over a period of a year or more, based on historical water use data. The Maximum Day Demand is the maximum demand that occurs one day out of a year, as determined by historical water use data. The Peak Hour Demand is the volume of water which must be supplied by a public water system to meet the demand of its customers during the hour in which the maximum amount of water is used for a yearly period, as determined by historical water use data. These demands are measured by an equivalent residential unit (ERU), or the amount of water demand equal to that required of a typical single family type residence served by a ¾-inch or one-inch meter (TPU 2015).

The Average Day Demand increased from 509,481 gpd (354 gpm) in 2008 to 582,427 gpd (405 gpm) in 2013, a 2.1 percent increase in flow per year. The Maximum Day Demand has varied from one million gpd (695 gpm) to 1.3 million gpd (903 gpm). A commonly accepted Peak Hour Demand is typically estimated to be approximately 170 percent of the Maximum Day Demand. Factoring in the ERUs and the Peaking Factor of 2.10 (the five year average of the ratio of the Maximum Day Demand to the Average Day Demand), the Average Day Demand for 2008 to 2013 was calculated as 255 gpd/ERU, the Maximum Day Demand was 535 gpd/ERU, and the Peak Hour Demand was 910 gpd/ERU (TPU 2015).

### 3.22.1.3 Geochemistry

#### *Waste Rock and Ore Material Sampling*

The total quantity of material to be mined for the Project (including waste rock and ore) is estimated at approximately 30 Mt. Of this amount, there would be ten Mt of ore and 20 Mt of waste rock. Waste rock and ore material sampling focused on the three major units (i.e., Siebert and Oddie Formations and Fraction Tuff) in proportion to the tonnages proposed to be excavated from each formation. Also, samples were selected to represent the range of chemistry and mineralogy within each lithology-alteration type, and were targeted to represent the materials spatially (both laterally and with depth). Tables 3.22-4 and 3.22-5 present the ore and waste rock production, and list the number of geochemical samples selected for various testing protocols.

**Table 3.22-4: Ore Production and Geochemical Sample Selection**

Formation	Lithology	Alteration	Total Ore (K tons)		Percent of Ore Material Type	Geochemical Samples and Testing	
						Geochemical Samples; ABA, TIC, NAG	MWMP Samples (subset)
Siebert	Volcanoclastics, Tuff	No alteration	8,752	--	86.7%	0	0
		Silicic		6,674		5	2
		Argillic		2,078		1	0
Fraction	Tuff	No alteration	1,197	--	11.9%	0	0
		Silicic		341		0	0
		Argillic		857		0	0
Oddie	Rhyolite	No alteration	144	--	1.4%	0	0
		Silicic		64		0	0
		argillic		79		0	0
<b>Total Ore (K tons):</b>			<b>10,093</b>	<b>10,093</b>	<b>100%</b>	<b>6</b>	<b>2</b>

**Table 3.22-5: Waste Rock Production Estimates and Geochemical Sample Selection**

Formation	Lithology	Alteration	Total Waste Rock (K tons)		Percent of Ore Material Type	Geochemical Samples and Testing		
						Geochemical Samples; ABA, TIC, NAG	MWMP Samples (subset)	HCT/ Mineralogical Analysis (subset)
Siebert	Volcano-clastics, Tuff	No alteration	18,169	--	91.4	2	0	0
		Silicic		3,313		4	0	1
		Argillic		14,856		12	3	2
Fraction	Tuff	No alteration	705	--	3.5	2	1	0
		Silicic		174		3	0	0
		Argillic		531		2	1	1
Oddie	Rhyolite	No alteration	292	--	1.5	0	0	0
		Silicic		78		1	0	0
		argillic		214		1	1	0
Brougher	Rhyolite	No alteration	702	--	3.5	0	0	0
		Silicic		--		0	0	0
		argillic		702		0	1	0
<b>Total Waste Rock (K tons):</b>			<b>19,868</b>	<b>19,868</b>	<b>100</b>	<b>27</b>	<b>7</b>	<b>4</b>

*Waste Rock and Ore Geochemical Testing Procedures*

Geochemical analysis on the 27 waste rock and six ore samples included the following:

- Acid-Base Accounting (ABA), including paste pH and sulfur speciation
- Total inorganic carbon (TIC)
- Net acid generation (NAG) testing
- Meteoric Water Mobility Procedure (MWMP) and Rinse Testing
- Humidity Cell Testing (HCT)
- Multi-element analyses (MEA)
- Optimal mineralogy and x-ray diffraction (XRD) mineralogy

The specifics of these testing methods are outlined in Hatch (2014).

### *Geochemical Testing Results Summary*

Baseline geochemical testing was conducted on 27 waste rock samples and six samples of ore material. Samples were selected from the Siebert and Oddie Formations and Fraction Tuff, and distributed among unaltered, silicic-altered, and argillic-altered samples. Samples were selected to be representative, by relative percentage, of the excavated material in terms of formation, alteration, geochemistry, and spatially (laterally and with depth).

Total sulfur and sulfide-S concentrations were very low in all of the waste rock samples, averaging 0.05 percent total sulfur and 0.01 percent sulfide-S content. Amongst these very low sulfur concentrations, there was no notable relationship between lithological units or alteration type and sulfur content. AP values, calculated based on sulfide-S concentrations, were similarly low. NP values for waste rock varied more widely, ranging from below analytical detection to 75 tons CaCO<sub>3</sub>/Kt. The samples with higher NP values were generally from the argillic-altered, Siebert Formation rocks. These rocks were directly correlated with higher TIC content, suggesting the higher NP values are associated with carbonate minerals, which typically provide a readily available source of neutralization. In terms of ABA criteria, the majority of samples had NP/AP values above the NDEP and BLM criteria predicting NAG. NAG testing indicated overall acid neutralizing behavior with pH values generally circum-neutral to strongly alkaline. Overall, the static ABA data indicate the waste material from the Project would be non-potentially acid generating.

Four samples of waste rock materials were selected for kinetic testing in HCT to obtain temporal mass release rates and a more accurate assessment and/or confirmation of the ABA and metal leaching behavior. The sample selection focused on materials with lower NP/AP ratios and lower NAG pH data. These tests were initiated in October 2014 and terminated in May 2015. Both the MWMP rinse test data and the HCT results indicate NAG behavior with circum-neutral pH values, low to moderate alkalinity, low sulfate production, and most metals concentrations near or below the analytical detection limits, with the exceptions of slight exceedences of the NRVs for pH, aluminum, As, Sb, and iron.

Similar to waste rock samples, total sulfur content in the ore samples was very low, averaging 0.044 percent. Sulfide-S content was below analytical detection of 0.01 percent in all samples, reflecting very low potential for acid generation in the ore. The NP values were also low, with an average NP content of 4.9 tons CaCO<sub>3</sub>/Kt. Again, the low AP and NP content of the ore suggest neither strongly acid-generating nor acid-neutralizing material. The NAG pH results for the ore samples were all in the circum-neutral to alkaline range. The HCT on the waste rock may act as proxy for the ore material because of the similar nature (in terms of ABA characteristics) of the ore and waste rock material.

MWMP rinse testing was completed on two split samples. Both samples produced rinsate with circum-neutral pH values, low to moderate alkalinity, and most metals concentrations near or below the analytical detection limits. Rinsate concentrations from the ore were slightly above the primary-based NRV for As, and exceeded the secondary-based NRVs for pH and aluminum.

#### **3.22.2 Effects of the Proposed Action**

There are no natural perennial streams or springs in the vicinity of the Project. The main ephemeral drainage in the Project Area is Slime Wash. Flow in ephemeral drainages occurs in

response to storm events; therefore, the only potential impacts to surface water quality would result from spills and sedimentation or erosion from surface disturbing activities. The potential impacts to surface water quality from spilled petroleum products would be minimized by the implementation of the Emergency Response Plan included as Appendix J of the Mine Plan. The potential impacts to surface water quality from sedimentation would be minimized by the implementation of the ACEPMs outlined in Section 2.1.11.

The Project would use approximately 750 gpm of make-up water from the TPU to operate the Project, which would occur over a three to four year operational period. During reclamation activities the water use would be substantially reduced. Using the highest Maximum Daily Demand of 1.3 million GPD (903 gpm) and the Project water demand of 750 gpm, the total water demand on the TPU system would be approximately 1,653 gpm. This amount equals approximately 87 percent of the TPU system capacity of 1,900 gpm. Therefore, the Project would consume approximately 750 gpm of water provided by the TPU, which is pumped from the Ralston Valley, which is within the capacity of the TPU system (TPU 2015). The Project would not affect any water users in the vicinity of the Project, since the Project would not be developing water resources within, or adjacent to, the Project Area.

### **3.22.3 Effects of the Powerline Alternative**

Under the Powerline Alternative, development and operation of the Project would result in approximately 539 acres of surface disturbance, or an additional 80 acres of erosion and sedimentation potential. Similar to the Proposed Action, potential impacts to surface water quality from spilled petroleum products would be minimized by the implementation of the Emergency Response Plan included as Appendix J of the Mine Plan, and potential impacts to surface water quality from sedimentation would be minimized by the implementation of the ACEPMs outlined in Section 2.1.11. Therefore, impacts to surface water quality under the Powerline Alternative would be similar to impacts under the Proposed Action.

Under the Powerline Alternative the mining operations and the water use activities would be the same as under the Proposed Action. This alternative would produce approximately the same amount and type of water impacts as the Proposed Action.

### **3.22.4 Effects of the On-Site Water Alternative**

Under the On-Site Water Alternative, development and operation of the Project would result in approximately 453 acres of surface disturbance, which is approximately six acres less than the Proposed Action. Therefore, impacts to surface water quality under the On-Site Water Alternative would be similar to impacts under the Proposed Action.

This alternative involves installing a well field in the Project Area to supply Project water needs and would involve pumping 750 gpm from the aquifer for operational use throughout the three-year operational life of the Project. The potential impacts of this approach were evaluated by simulating a well field located near the Rex Shaft and associated historical underground mine workings. Four years of pumping were assumed in order to be conservative and two scenarios were simulated:

- Scenario 1: involved construction of wells directly into existing underground workings to take advantage of the storage and permeability offered by the workings for water

production. This scenario was simulated using the highest estimate of hydraulic conductivity for the Project ( $1.4 \times 10^{-2}$  ft/min ( $7.0 \times 10^{-3}$  cm/s)) based on the analysis of the observed discharges from the Rex Shaft (Section 7.2.2).

- Scenario 2: involved construction of wells adjacent to the underground mine workings, which would also take advantage of the storage and permeability of the workings but without a direct connection. This scenario was simulated using the geometric mean of all the hydraulic conductivity estimates for the Project Area. The geometric mean hydraulic conductivity ( $3.4 \times 10^{-4}$  ft/min ( $1.5 \times 10^{-4}$  cm/s)) is at the mid to low end of the range of hydraulic conductivity estimates for fractured volcanic aquifers suggested by Freeze and Cherry (1979):  $1.0 \times 10^{-6}$  cm/s to  $1.0 \times 10^{-2}$  cm/s.

Analytical results suggest a negligible drawdown for Scenario 1 with the predicted ten-foot drawdown (ten-foot isopleth) reaching a maximum of approximately 130 feet from the footprint of the underground mine workings (Rex Shaft located at the north edge of the Project Area) at the end of pumping. For Scenario 2, the ten-foot isopleth extends to a maximum of 5,000 feet from the simulated well field about four years after the end of pumping. It is likely any drawdown in the water table would not be circular and uniform in extent due to the presence of the underground mine workings and anisotropy in the aquifer (faults and fractures). Storage within the existing underground workings has not been considered explicitly in this analysis to be conservative because the volume of the saturated workings is uncertain. However, it is likely in at least the early stages of pumping, the saturated workings would act as a water source. The predicted impacts of the scenarios simulated may, therefore, be artificially high. Despite this, in neither scenario does the predicted aquifer drawdown adversely affect local or regional ground water users, regardless of the shape of the drawdown 'cone'.

### **3.22.5 Effects of the Knapp Avenue Access Only Alternative**

Under the Knapp Avenue Access Only Alternative, development and operation of the Project would result in approximately 458 acres of surface disturbance, which is approximately one acre less than the Proposed Action. Therefore, impacts to surface water quality under the Knapp Avenue Access Only Alternative would be similar to impacts under the Proposed Action.

Under the Knapp Avenue Access Only Alternative the mining operations and the water use activities would be the same as under the Proposed Action. This alternative would produce approximately the same amount and type of water impacts as the Proposed Action.

### **3.22.6 Effects of the No Action Alternative**

Under the No Action Alternative none of the mining operations and water use activities would occur. Therefore, none of the water resources related effects associated with these activities would occur under this alternative.

### 3.23 Wildlife

#### 3.23.1 Affected Environment

A total of eight mammal, two avian, and eight reptile species were directly observed or detected by sign (e.g., tracks, scat, feathers, calls, prey remains, burrows). Eight non-special status mammals were observed or detected within and surrounding the Project Area: American badger (*Taxidea taxus*); black-tailed jackrabbit (*Lepus californicus*); coyote (*Canis latrans*); desert cottontail (*Sylvilagus audubonii*); kangaroo rat (*Dipodomys* spp.); pronghorn antelope (*Antilocapra americana*); white-tailed antelope ground squirrel (*Ammospermophilus leucurus*); and woodrat (*Neotoma* spp.). Two non-MBTA protected avian species were observed or detected within and surrounding the Project Area: chukar (*Alectoris chukar*); and rock dove (*Columba livia*). Eight reptiles were observed within and surrounding the Project Area: common side-blotched lizard (*Uta stansburiana*); desert horned lizard (*Phrynosoma platyrhinos*); Great Basin collared lizard (*Crotaphytus bicinctores*); Great Basin gopher snake (*Pituophis catenifer*); Great Basin rattlesnake (*Crotalus oreganus lutosus*); long-nosed leopard lizard (*Gambelia wislizenii*); western fence lizard (*Sceloporus occidentalis*); and western whiptail (*Aspidoscelis tigris*).

##### 3.23.1.1 Mammals

Two small game species were observed within and surrounding the Project Area: black-tailed jackrabbit and desert cottontail. Black-tailed jackrabbits were the most commonly observed mammal. This species was observed throughout the day (when flushed) and when traveling (driving) at dusk and dawn. Five black-tailed jackrabbits were observed during the spotlight survey that covered 7.3 road-miles. Notably, more black-tailed jackrabbits were recorded during the daylight hours than in the spotlight survey. During one survey event on July 8, 2014, seven black-tailed jackrabbits were recorded along 3.8 miles of road in less than one hour. This count was made while on Knapp Avenue and traveling south to the Three Hills Mine area and then east toward Brougher Mountain. The desert cottontail was recorded only in the Slime Wash area and the area northeast of the Project in the historic dump area. Some locations exhibited signs indicative of heavy grazing by lagomorphs or rodents on grass and shrubs.

Two American badger burrows were observed within and surrounding the Project Area. The first American badger burrow was located at an elevation of 5,949 feet amsl with scat at the opening of this burrow. The second burrow was occupied and was located at an elevation of 5,856 feet amsl.

Numerous coyote skulls were observed within and surrounding the Project Area, in particular at Siebert Mountain and the Three Hills Mine area. These remains were likely from individuals that were shot as one skull exhibited an obvious bullet hole. Coyotes were observed in the early morning northwest of Brougher Mountain and south of the Three Hills Mine area. In both cases, individuals were flushed from resting spots. One leg-hold trap setup location was noted in the Slime Wash.

Although kangaroo rat burrows were observed within and surrounding the Project Area, few signs of current activity were noted (e.g., tracks, tail drag). Heteromyid rodents (e.g., kangaroo rats and mice) can aestivate in the summer, and some wildlife species likely were doing so

during the wildlife survey period. In addition, heteromyids plug their burrows when aestivating; thus, presence or absence of burrow openings may not accurately estimate presence or absence of kangaroo rats and mice during the time of year of the surveys. Only one kangaroo rat was observed during the spotlight survey; however, it could not be identified to species.

#### 3.23.1.2 Reptiles

Two snake species, Great Basin gopher snake and Great Basin rattlesnake, were observed within and surrounding the Project Area. Both of these snake individuals were small and not adult-sized. Both were recorded near the Three Hills Mine area. No snakes were observed during the spotlight survey. Conditions during the survey were suitable for snake activity (i.e., starting temperature was 77 °F). The six lizards observed within and surrounding the Project Area were all adults except for one newly-hatched side-blotched lizard observed in the vicinity of the Three Hills Mine area.

#### 3.23.1.3 Ungulates

Pronghorn antelope were the only large game species observed within and surrounding the Project Area. Pronghorn antelope were observed in the lower elevations on four occasions. Pronghorn antelope tracks and scat were most commonly observed in the low elevations, but some sign was also observed in the foothills near Brougher Mountain, Siebert Mountain, and the Three Hills Mine area. A pronghorn antelope jawbone was found in a wash on the north-facing slope of one of the hills in the Three Hills Mine area.

#### 3.23.1.4 Birds

Two non-MBTA protected avian species were observed during field surveys: rock dove and chukar. Rock doves were observed nesting (and roosting) in mineshafts. Both rock dove eggs and young were observed. Except for rock doves, no other avian breeding activity was observed. However, based on the time of year, the other avian species recorded could be expected to breed within and surrounding the Project Area. Various avian species are expected to use the Project Area while migrating in the spring and fall.

Chukars live and breed at the high school and middle school in the Town of Tonopah. While chukars were observed near the middle school on the way into the Project Area, no chukars were recorded within or surrounding the Project Area. Chukars were, however, indirectly detected within and surrounding the Project Area via scat in the upper elevation rocky slopes of Siebert Mountain.

### **3.23.2 Effects of the Proposed Action**

Direct impacts to wildlife with suitable habitat in the Project Area would consist of habitat loss and disturbance from human activity and noise. Vegetation removal associated with surface disturbing activities would result in a reduction of 459 acres of wildlife habitat within the Project Area; however, the fenced portion of the Project Area would temporarily deter wildlife access to the Project Area within a 480-acre area. The fence would be removed after mining activities have ceased, and the mine facilities would be reclaimed and revegetated, returning approximately 405 acres of land to wildlife access and habitat. The open pit would not be reclaimed,

permanently removing approximately 75 acres from long-term wildlife habitat uses for most species. However, the open pit wall could potentially result in new raptor nesting habitat. ACEPMs outlined in Section 2.1.11 would help reduce any impacts to wildlife as a result of Project activities.

### **3.23.3 Effects of the Powerline Alternative**

Under the Powerline Alternative, impacts to wildlife and wildlife habitat would be similar to impacts under the Proposed Action, as disturbance associated with the powerline would primarily be conducted outside the fence boundary.

### **3.23.4 Effects of the On-Site Water Alternative**

Under the On-Site Water Alternative, development and operation of the Project would remove or disturb approximately 453 acres of wildlife habitat, of which 75 acres associated with the open pit would not be reclaimed. Similar to the Proposed Action, the ACEPMs and reclamation would minimize this alternative's effect on wildlife and wildlife habitat. Impacts to wildlife and wildlife habitat under the On-Site Water Alternative would be the same as the Proposed Action, with temporary habitat loss of approximately 480 acres associated with the fenced area.

### **3.23.5 Effects of the Knapp Avenue Access Only Alternative**

Under the Knapp Avenue Access Only Alternative, development and operation of the Project would be similar to the Proposed Action. Therefore, impacts to wildlife and wildlife habitat would be similar to the Proposed Action.

### **3.23.6 Effects of the No Action Alternative**

Under the No Action Alternative, up to five acres of surface disturbance could occur within the Project Area under Notice-level exploration activities. This would result in the temporary loss of approximately five acres of wildlife habitat. Reclamation of surface disturbance would gradually eliminate potential impacts to wildlife and wildlife habitat. Impacts to wildlife and wildlife habitat would be similar, but proportionally less than the Proposed Action (approximately five acres of temporary habitat loss versus approximately 480 acres associated with the fenced portion of the Proposed Action).

## **4 CUMULATIVE EFFECTS**

### **4.1 Introduction**

For the purposes of this EA, the cumulative impacts are the sum of all past, present, and reasonably foreseeable future actions (RFFAs) resulting primarily from mining, commercial activities, and public uses. The purpose of the cumulative analysis in the EA is to evaluate the significance of the Proposed Action's contributions to cumulative impacts. A cumulative impact is defined under federal regulations as follows:

"...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" (40 CFR 1508.7).

As required under the NEPA and the regulations implementing NEPA, this chapter addresses those cumulative effects on the environmental resources in the Cumulative Effects Study Areas (CESAs) that could result from the implementation of the Proposed Action and reasonable alternatives, past actions, present actions, and RFFAs. The extents of the CESAs vary by each resource, based on the geographic or biological limits of that resource. As a result, the list of projects considered under the cumulative analysis may vary according to the resource being considered. In addition, the length of time for cumulative effects analysis varies according to the duration of impacts from the Proposed Action on the particular resource.

For the purposes of this analysis and under federal regulations, 'impacts' and 'effects' are assumed to have the same meaning and are interchangeable. The cumulative impacts analysis was accomplished through the following three steps:

Step 1: Identify, describe, and map the CESA for each resource to be evaluated in this chapter.

Step 2: Define timeframes, scenarios, acreage, and activity estimates for cumulative impact analysis.

Step 3: Identify and quantify the location of possible specific impacts from the Proposed Action and judge the significance of these contributions to the overall impacts.

### **4.2 Cumulative Effects Study Areas**

Environmental consequences of the Proposed Action and reasonable alternatives were previously evaluated in Chapter 3 for the various environmental resources. Discussed in the following sections are the resources with the potential to be cumulatively impacted by the Proposed Action within the identified CESAs. The discussions are based upon the previous analysis in Chapter 3 of each environmental resource. Based on the preceding analysis, the Proposed Action would not impact the following resources and would therefore not have cumulative impacts: Cultural Resources (indirect effects); Fire Management; Paleontological Resources; and Water Quality (ground water). These resources are not discussed further in the cumulative impacts section. In addition, through consultation between the BMD Native American Coordinator and Timbisha Shoshone Tribe, Yomba Shoshone Tribe, and Duckwater Shoshone Tribe it was determined the Tribes did not identify any issues with the Project. Based on that, it was determined the Project

would not contribute to Native American cumulative effects. Native American Concerns are not further analyzed in the EA.

The following 19 elements or resources have been brought forward for cumulative impact analysis: Air Quality; Cultural Resources (direct effects); Geology and Mineral Resources; Lands and Realty; Migratory Birds; Noise; Noxious Weeds, Invasive and Non-native Species; Public Safety; Rangeland Management; Recreation; Socioeconomics; Soils; Special Status Species; Transportation/Traffic; Vegetation; Visual Resources; Wastes, Hazardous or Solid; Water Quality (Surface); and Wildlife (General). The geographic areas considered for further analysis of cumulative effects vary in size and shape to reflect each evaluated environmental resource and the potential area of impact to each from the Proposed Action as determined through the analysis in Chapter 3.

The Air Quality CESA is a 50-kilometer buffer around the Project Area (Figure 4.2.1). The Air Quality CESA represents the likely maximum extent of which potential impacts from Project air emissions could contribute to the basin air quality.

The Direct Effects Cultural Resources CESA is the Project Area (Figure 4.2.2). The Cultural Resources CESA represents the likely maximum extent to which potential direct impacts to cultural resources could occur from the Project.

The Geology CESA is the Tonopah Mining District and the Project Area (Figure 4.2.3). The Geology CESA represents the likely maximum extent of which potential impacts from Project mining activities could contribute to regional mineral resource conditions.

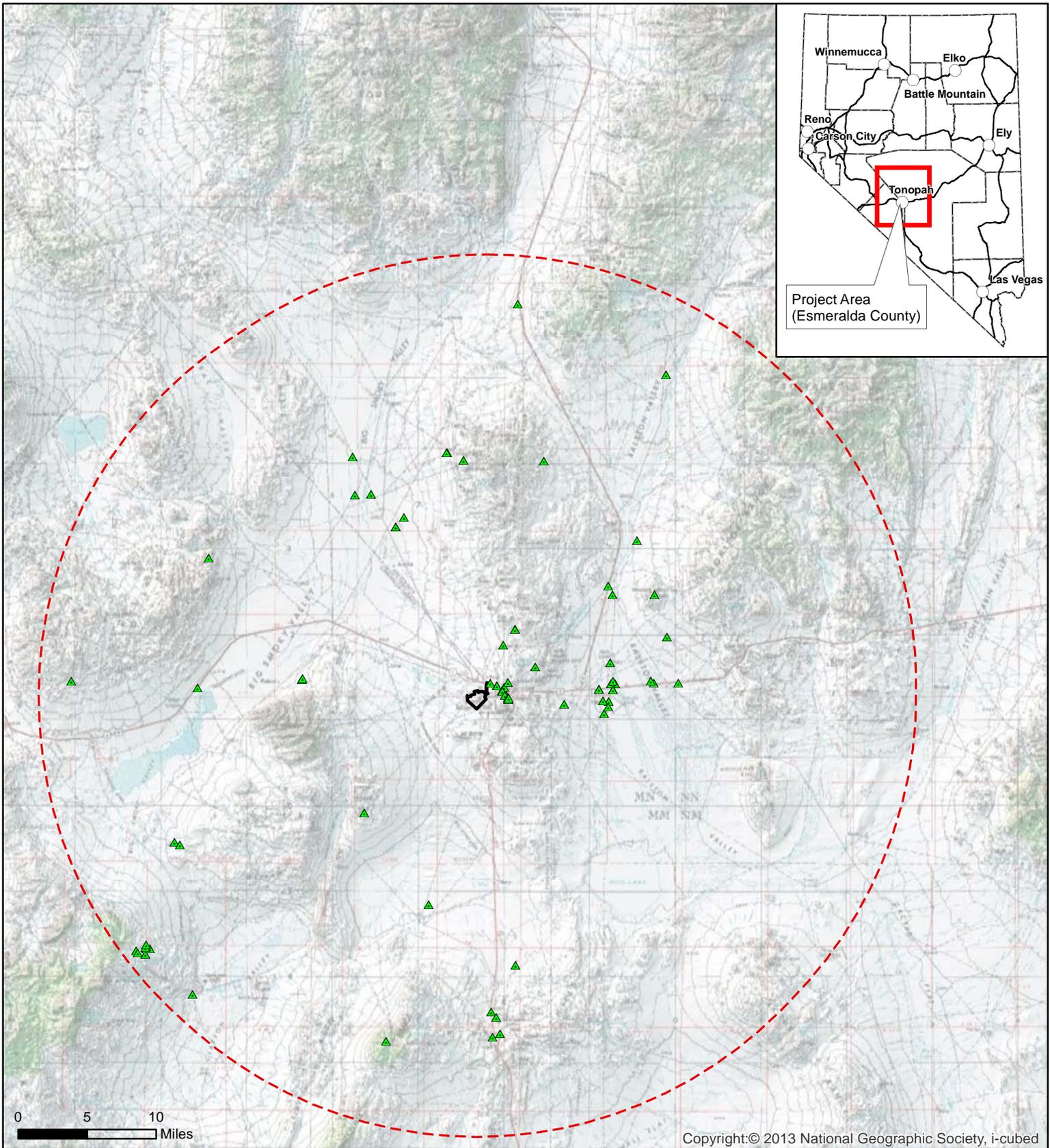
The Golden Eagle CESA is a modified ten-mile buffer of the Project Area extended to the north to include features that could potentially affect the frequency of raptors within and near the BSA (i.e., additional cliffs and a solar power facility) (Figure 4.2.2).

The Noise CESA is based on the extent of modeling (Figure 3.9.1), and the likely maximum extent of potential impacts Project activities would have on the noise environment in the vicinity of the Project.

The Range CESA includes the Silver King Allotment, the northern portion of the Montezuma Allotment, and a portion of the road network that access the Project (Figure 4.2.3). The Range CESA is the area for cumulative effects analysis for Rangeland Management and Lands and Realty.

The Recreation CESA is the CESA for migratory birds, special status wildlife species, general wildlife, and recreation (Figure 4.2.3). This CESA has been identified as the proposed Tonopah Hills Extensive Recreation Management Area, and represents the likely maximum extent Project activities could have on wildlife and recreation in the area.

The Socioeconomics CESA was selected to be Esmeralda County and Nye County Census Tract 9602, as Esmeralda County is where the Project is located, and Nye County Census Tract 9602 is where the Town of Tonopah is located (Figure 3.15.1). Most of the Project employees are anticipated to live in Tonopah.



**Explanation**

-  Project Area
-  Air Quality CESA
-  Permitted Air Emission Sources



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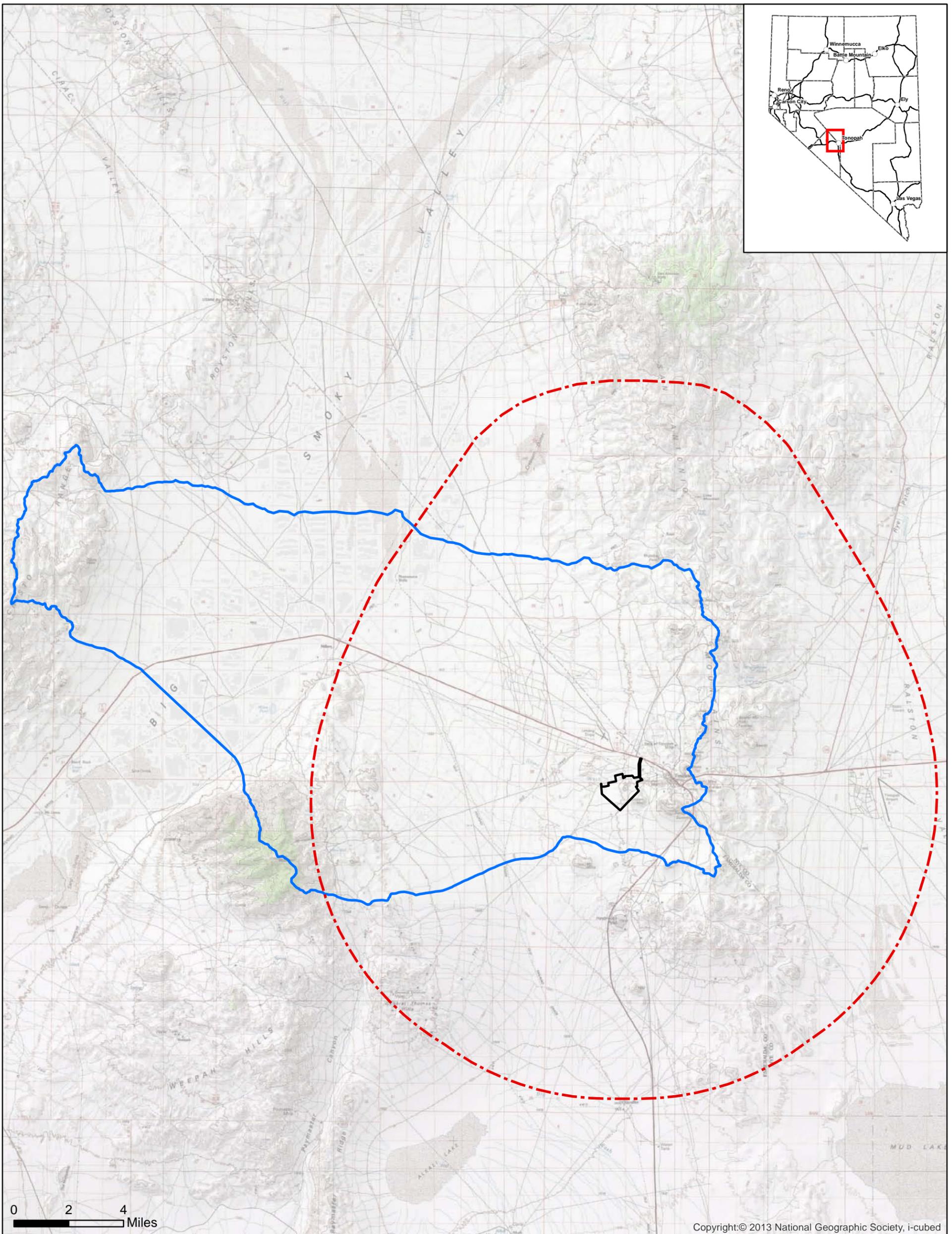
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**THREE HILLS MINE PROJECT**

**Air Quality  
 Cumulative Effects Study Area**

Figure 4.2.1

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0 2 4 Miles

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**Explanation**

-  Project Area/Direct Cultural CESA
-  Golden Eagle CESA
-  Watershed CESA



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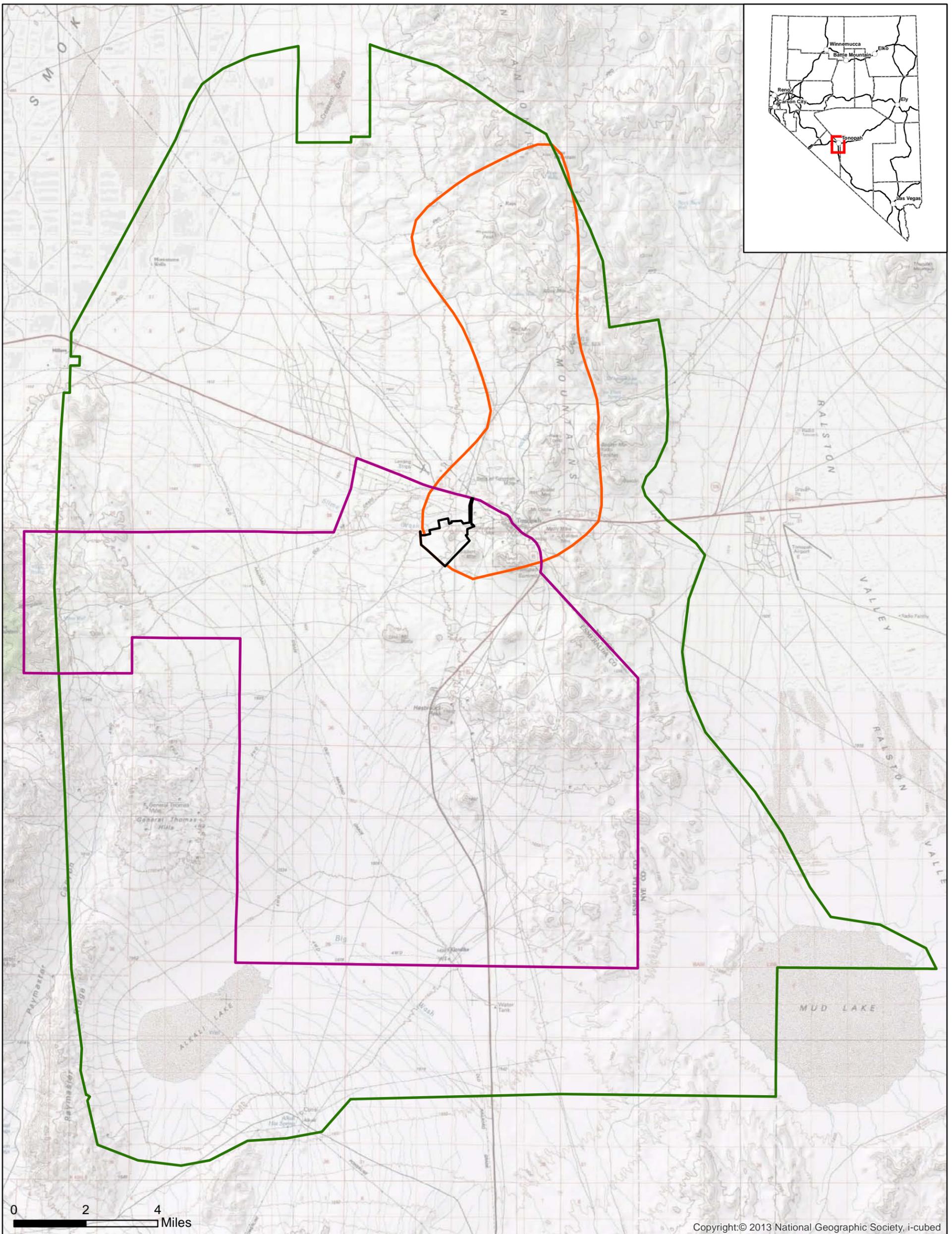
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**Cultural, Golden Eagle,  
 and Watershed  
 Cumulative Effects Study Areas**

Figure 4.2.2

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**Explanation**

-  Project Area
-  Geology CESA
-  Range CESA
-  Recreation CESA



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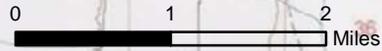
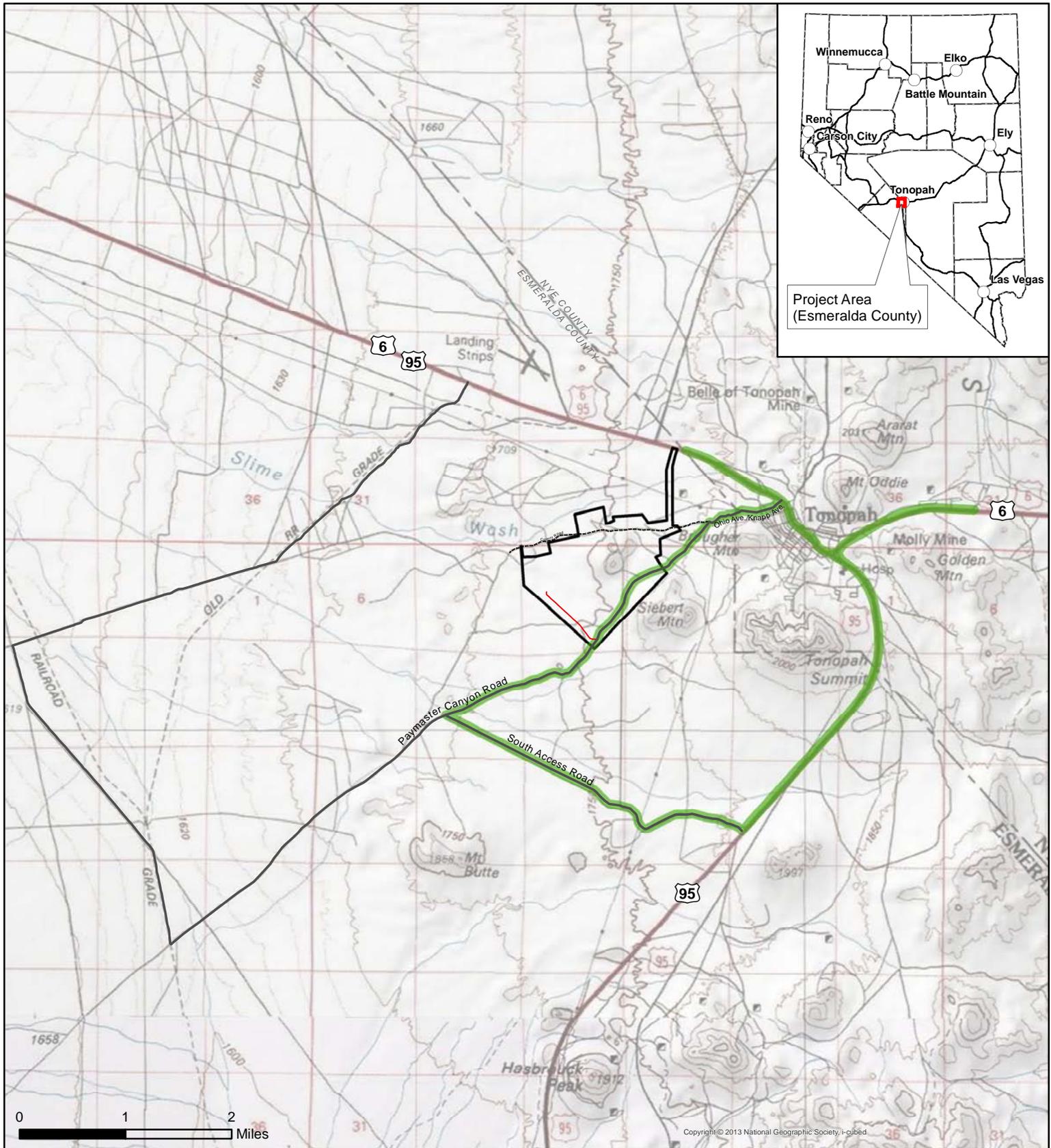
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**THREE HILLS MINE PROJECT**

**Geology, Range, and Recreation  
 Cumulative Effects Study Areas**

**Figure 4.2.3**

10/07/2015



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**Explanation**

- Existing Access Routes
- County Road
- Proposed Project Access Road
- Project Area
- Public Safety and Transportation CESA



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**BUREAU OF LAND MANAGEMENT**

**THREE HILLS MINE PROJECT**

Public Safety and Transportation  
 Cumulative Effects Study Areas

Figure 4.2.4

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The Transportation CESA is the road network including a portion of State Highway 95, a portion of Knapp Avenue, a portion of Paymaster Canyon Road, and South Access Road (Figure 4.2.4). This CESA is also the CESA for public safety, as most of the public safety issues would occur in association with the road network.

The Visual Resources CESA is a ten-mile viewshed from a reference point in the Project Area (Figure 3.20.1). This represents the likely maximum extent of Project-related visual impacts.

The Wastes CESA is defined as the Project Area, as most or all of the impacts from hazardous or solid wastes would occur in the Project Area (Figure 1.1.1).

The Watershed CESA is the CESA for noxious weeds, invasive and non-native species, soils, vegetation, and surface water quality (Figure 4.2.2). The Watershed CESA has been defined as the southern portion of the Hydrologic Unit Code 12 (HUC 12) watershed, and was selected to analyze these resources as they are all interrelated within the watershed system.

Table 4.2-1 outlines the CESA area for each resource analyzed in this section.

**Table 4.2-1: Cumulative Effects Study Areas**

Resource	Cumulative Effects Study Area (CESA)	Description of CESA	Size of CESA (acres)
Air Quality	Air Quality CESA	50 kilometers around Project Area	2,444,580
Geology and Mineral Resources	Geology CESA	Tonopah Mining District and portion of Project Area	27,681
Golden Eagles	Golden Eagle CESA	Ten miles around Project Area with additional area to the north encompassing cliffs and Crescent Dunes	294,509
Noxious Weeds, Invasive and Non-native Species; Soils; Vegetation; Water Quality (Surface)	Watershed CESA	Southern Portion of HUC 6 Watershed	165,759
Recreation; Migratory Birds; Special Status Species (Wildlife); Wildlife (General)	Recreation/Wildlife CESA	Outer boundary of the RMP revision proposed Tonopah Hills Extensive Recreation Management Area	303,699
Lands and Realty; Rangeland Management	Range CESA	Silver King Allotment and the northern portion of the Montezuma Allotment with a portion of the road network to the north of the Montezuma Allotment	98,372
Noise	Noise CESA	Extent of noise modeling impacts	3,894
Public Safety; Transportation/Traffic	Transportation CESA	Roadway network affected by Project	N/A

Resource	Cumulative Effects Study Area (CESA)	Description of CESA	Size of CESA (acres)
Socioeconomics	Socioeconomics CESA	Esmeralda County and Nye County Census Tract 9602	4,214,806
Visual Resources	Visual Resources CESA	Ten-mile Viewshed from Reference Point in Project Area	N/A
Wastes, Hazardous or Solid and Direct Effects Cultural Resources	Project Area	Project Area	722

### 4.3 Past and Present Actions

Past and present actions in the CESAs include the following: livestock grazing; wildlife habitat management; wildland fires; dispersed recreation; utility and other ROW construction and maintenance; mineral exploration (including approved surface exploration within the Project Area) and mining. The Town of Tonopah is located within a majority of the CESAs, with the exception of the Project Area CESA, and a portion of the Town of Tonopah is not within the Range CESA. The Town of Tonopah encompasses approximately 4.9 square miles. The Town of Tonopah consists of roads, residences, commercial and public buildings, powerlines, historic mining facilities and surface disturbance, historic dump, historic irrigated fences, and other related development.

#### 4.3.1 Livestock Grazing

Portions of 13 allotments are located within the Air Quality CESA, portions of six allotments are located within the Indirect Effects Cultural Resources CESA, portions of six allotments are located in the Golden Eagle CESA, portions of three allotments are located in the Range CESA, portions of six allotments are located in the Recreation/Wildlife CESA, portions of 20 allotments are located in the Socioeconomics CESA, and portions of six allotments are located in the Watershed CESA. The allotments that are located within or intersect each of the CESAs are listed in Table 4.3-1. Current activities within the allotments are primarily livestock grazing.

**Table 4.3-1: Allotments Located within or Intersecting the CESAs**

Allotment	CESA						
	Air Quality	Cultural Resources	Golden Eagle	Range	Recreation/Wildlife	Socioeconomics	Watershed
Fish Lake Valley	X					X	
Hot Creek						X	
Hunts Canyon	X					X	
Ice House						X	
Magruder Mountain	X					X	
Monte Cristo	X	X	X	X	X	X	X

Allotment	CESA						
	Air Quality	Cultural Resources	Golden Eagle	Range	Recreation/Wildlife	Socioeconomics	Watershed
Montezuma	X	X	X	X	X	X	X
Nyala						X	
Ralston	X	X	X		X	X	X
Red Spring	X					X	
Reveille						X	
San Antone	X	X	X		X	X	X
Sand Springs						X	
Sheep Mountain	X	X	X		X	X	X
Silver King	X	X	X	X	X	X	X
Silver Peak	X					X	
Stone Cabin	X					X	
White Sage						X	
White Wolf						X	
Yellow Hills	X					X	

### 4.3.2 Wildlife Habitat Management

Portions of seven hunt units are located within the Air Quality CESA, portions of six hunt units are located within the Indirect Effects Cultural Resources CESA, portions of six hunt units are located in the Golden Eagle CESA, portions of two hunt units are located in the Range CESA, portions of seven hunt units are located in the Recreation/Wildlife CESA, portions of 12 hunt units are located in the Socioeconomics CESA, and portions of seven hunt units are located in the Watershed CESA. The hunt units that are located within or intersect each of the CESAs are listed in Table 4.3-2. Research and management of wildlife are undertaken by the NDOW and BLM.

**Table 4.3-2: Hunt Units Located Within or Intersecting the CESAs**

Hunt Unit	CESA						
	Air Quality	Cultural Resources	Golden Eagle	Range	Recreation/Wildlife	Socioeconomics	Watershed
132						X	
133						X	
134						X	
161	X				X	X	X
162	X	X	X		X	X	X
163						X	
171	X	X	X		X	X	X
173	X	X	X		X	X	X
211	X	X	X		X	X	X
212	X	X	X	X	X	X	X
245						X	
251	X	X	X	X	X	X	X

Mule deer, pronghorn antelope, and elk harvest data were obtained from the NDOW for the 2014 hunting season (NDOW 2015). Table 4.3-3 shows the harvest data for each hunt unit listed in Table 4.3-2.

**Table 4.3-3: 2014 Harvest Data**

Hunt Unit	# of Mule Deer Harvested	# of Pronghorn Antelope Harvested	# of Elk Harvested
132	87	24	15
133	19	3	--
134	4	5	--
161	127	17	17
162	114	6	73
163	35	6	5
171	45	16	--
173	143	7	--
211	19	1	--
212	19	--	--
245	2	4	--
251	21	20	--

Source: NDOW 2015

### 4.3.3 Wildland Fires

Although there are no recorded wildland fires within the Project Area, there have been approximately 1.3 acres of the Big Smokey fire (July 2012) recorded in the Air Quality CESA.

### 4.3.4 Recreation

Historic recreational use in the CESAs includes motorcycle and off-highway vehicle (OHV) riding, horseback riding, mountain bicycling, camping, driving for pleasure, hiking, hunting, rockhounding, photography, rock climbing, wildlife viewing, picnicking, four wheel driving, and other dispersed recreational activities.

### 4.3.5 Rights-of-Way

The BLM's Land & Mineral Legacy Rehost 2000 System (LR2000) database was used to query the various types of ROWs that have been authorized or constructed in the CESAs by Section, Township, and Range, and include the following: roads and highways; solar facilities; wind development projects; power transmission; communication sites; telecommunications; water and irrigation facilities; and other (undefined) ROWs. The exact acreage of surface disturbance associated with these ROWs cannot be quantified; however, it is assumed these types of ROWs and the construction and maintenance associated with these facilities would create a level of surface disturbance that would contribute to cumulative impacts to various resources. In addition, certain types of ROWs can fragment habitat or create barriers or hazards for wildlife passage. The LR2000 database was queried on June 26, 27, and 29, 2015, for the Air Quality, Cultural Resources, Geology, Range, Recreation/Wildlife, and Watershed CESAs, and July 1, 2015, for the Golden Eagle CESA. Any newly approved ROWs that have been added to the LR2000 database after these dates are not included in this analysis. The approximate total acreages of authorized and existing ROWs within each CESA are listed in Table 4.3-4. In addition to the number of roads, highways, and power transmission lines within the CESAs, there are numerous roads and routes on public lands that do not have ROWs, as well as roads and routes on private lands. The most notable ROW would be the Crescent Dunes Solar Energy Project, located approximately 13.5 miles northwest of Town of Tonopah, Nevada. This solar project includes

approximately 1,673 acres of disturbance associated with a solar field, a transmission line, access roads, and other facilities needed for operations (BLM 2010). There are approximately 45 employees with approximately half permanently residing in the Town of Tonopah (Eason 2015).

**Table 4.3-4: Past and Present Rights-of-Way Acres in the CESAs**

ROW Type	CESA (acres)					
	Air Quality	Cultural Resources	Golden Eagle	Range	Recreation/Wildlife	Watershed
Roads and Highways	13,190	4,741	5,191	2,539	5,406	3,100
Solar Facilities	1,673	0	1,673	0	1,673	0
Wind Development	1	0	0	0	0	0
Power Transmission	26,548	5,359	5,465	4,565	5,482	6,292
Communication Sites	498	249	249	25	98	198
Telecommunications	1,229	1,103	2,758	799	2,756	2,745
Water Facilities	702	298	298	5	314	273
Other	1,562	2	2	1	1	2
<b>Total</b>	<b>45,403</b>	<b>11,752</b>	<b>15,636</b>	<b>7,934</b>	<b>15,730</b>	<b>12,610</b>

Source: BLM 2015a

#### 4.3.6 Mineral Exploration and Mining

The LR2000 database was queried by Section, Township, and Range to show the past and present mineral exploration or mining activities (i.e., authorized and closed Notices, authorized and closed plans of operation, and mineral material disposal sites) that have been issued within the CESAs. Past and present mineral exploration and mining activities in the CESAs include historic and current mineral exploration and mining operations. Table 4.3-5 shows the results of the LR2000 query, in acres, of the exploration and mining activities within each CESA. The LR2000 database was queried on June 26, 27, and 29, 2015, for the Air Quality, Cultural Resources, Geology, Range, Recreation/Wildlife, and Watershed CESAs, and July 1, 2015, for the Golden Eagle CESA. Any newly authorized mineral exploration or mining activities that have been added to the LR2000 database after these dates are not included in this analysis. Current active mines in the CESAs include the Silver Peak lithium facility and Mineral Ridge Mine in Esmeralda County. There are approximately 620 authorized disturbance acres at the Silver Peak facility, and approximately 906 authorized disturbance acres at the Mineral Ridge Mine (BLM 2015b). Both of these projects are located in the Air Quality CESA, while the Range CESA only includes the Silver Peak project. There is also the recently authorized Eastside Exploration Project, located in the Air Quality and Watershed CESAs, with a total of 45 acres of authorized surface disturbance (BLM 2015a).

**Table 4.3-5: Past and Present Minerals Disturbance Acres in the CESAs**

<b>CESA</b>	<b>Authorization Status</b>	<b>Total Acres of Disturbance</b>
<b>Air Quality CESA</b>	Authorized and Closed Notices	459
	Authorized and Closed Plans of Operation	4,150
	Mineral Material Disposal Sites	3,030
	<b>Air Quality CESA Total</b>	<b>7,639</b>
<b>Cultural Resources CESA</b>	Authorized and Closed Notices	89
	Authorized and Closed Plans of Operation	0
	Mineral Material Disposal Sites	650
	<b>Cultural Resources CESA Total</b>	<b>739</b>
<b>Geology CESA</b>	Authorized and Closed Notices	23
	Authorized and Closed Plans of Operation	0
	Mineral Material Disposal Sites	140
	<b>Geology CESA Total</b>	<b>163</b>
<b>Golden Eagle CESA</b>	Authorized and Closed Notices	98
	Authorized and Closed Plans of Operation	4
	Mineral Material Disposal Sites	750
	<b>Golden Eagle CESA Total</b>	<b>852</b>
<b>Range CESA</b>	Authorized and Closed Notices	73
	Authorized and Closed Plans of Operation	620
	Mineral Material Disposal Sites	40
	<b>Range CESA Total</b>	<b>733</b>
<b>Recreation/Wildlife CESA</b>	Authorized and Closed Notices	114
	Authorized and Closed Plans of Operation	4
	Mineral Material Disposal Sites	450
	<b>Recreation/Wildlife CESA Total</b>	<b>568</b>
<b>Watershed CESA</b>	Authorized and Closed Notices	60
	Authorized and Closed Plans of Operation	45
	Mineral Material Disposal Sites	658
	<b>Watershed CESA Total</b>	<b>763</b>

Source: BLM 2015a

In addition to the data from LR2000, a major amount of historic mining occurred in the vicinity of Tonopah and Goldfield between 1900 and World War II. Around Tonopah, the Tonopah Mining District is coincident with the Town of Tonopah. The district produced approximately \$150 million in gold and silver (non-inflation adjusted). Essentially all the mining operations were underground. The surface remnants include equipment, buildings, waste rock dumps and tailings and covers approximately 730 acres. There are additional mining-related surface disturbance within the District; however, the Town of Tonopah has built over the features. Approximately five miles south of Tonopah is the Divide District, which produced silver from the 1910s to the 1940s. The district produced approximately \$3.5 million in silver and some gold. Again, essentially all the mining was underground and the surface remnants are waste rock dumps, tailings and some buildings. In the vicinity of Goldfield is the Goldfield District, which experienced the majority of operations between 1904 and 1915 and produced approximately \$89 million from gold and silver, as well as some copper and lead.

#### **4.4 Reasonably Foreseeable Future Actions**

In addition to the proposed Three Hills Mine, the other notable RFFA is the proposed Gemfield Mine Project. The proposed Gemfield Mine Project is located approximately 0.5 mile north of the Town of Goldfield, in the historic Goldfield Mining District, in Esmeralda County, Nevada.

Approximately 1,075 acres of surface disturbance would occur within the proposed Plan of Operations boundary. The Gemfield Mine Project includes the construction and operation of a conventional open pit mining operation to extract and recover gold. Major components of the Gemfield Project would include the following components: open pit; crushing facilities, conveyors, and associated stockpiles; waste rock disposal areas; overburden stockpile; storm water diversions channels, sediment basins, and berms; heap leach pad, processing facilities, and ponds; water supply and dewatering wells and delivery/storage system; haul and secondary roads; exploration activities; and ancillary facilities including power supply, storm water controls, buildings including administration, plant growth media stockpiles, ground water monitoring wells, borrow areas, fencing, and yards. There are approximately 13 ROWs associated with the Gemfield Mine Project. Of these ROWs, there are 17 actions which consist of relinquishment and closure of ROW case files, amendments of ROWs, and the addition of new ROWs. This RFFA is located in the Air Quality and Socioeconomic CESAs.

#### 4.5 Cumulative Impact Analysis

##### 4.5.1 Air Quality

The CESA for air quality is the Air Quality CESA. This CESA encompasses approximately 2,444,580 acres and is shown on Figure 4.2.1. For the purpose of this analysis, the cumulative impacts are the sum of all air pollutant emission sources resulting primarily from mining, commercial activities and public uses within a 50 kilometer radius around the Project Area (Figure 4.2.1).

*Past and Present Actions:* The potential air emission sources likely contributing to air quality impacts include wildland fire, dispersed recreation, minerals exploration and mining activities, industrial operations (i.e., construction facilities, power generation facility, generator), 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 4.5-1 provides a summary of the emissions within the 50 kilometer radius around the Project Area. These emissions include those sources that have air quality operating permits from the BAPC, vehicle travel on state routes and other roads, and the Tonopah Municipal Airport. Not included in this analysis and not reasonably quantifiable is the travel on gravel and unimproved roads, which would contribute to the present combustion emissions and fugitive dust.

**Table 4.5-1: Past and Present Air Quality Emissions within a 50 Kilometer Radius of the Project Area**

Emission Sources	Cumulative Emissions (tpy)						
	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	NOx	SO <sub>2</sub>	CO	VOC
Facilities	99.95	108.40	63.40	89.62	84.02	52.42	33.38
Roads/Vehicles	621.71	621.71	571.51	15,943.57	49.77	8,865.52	694.10
<b>Total</b>	721.66	730.11	634.91	16,032.19	133.79	8,917.94	727.48

*RFFAs:* Livestock grazing, fire management, wildland fire, wildlife and game habitat management, ROW construction and maintenance, mineral exploration and mining, and

dispersed recreation have the potential to continue to occur within the Air Quality CESA and have the potential to impact air quality; however, emissions from these activities are not reasonably quantifiable. The Gemfield Project is an RFFA and the anticipated emissions from that source are included in Table 4.5-2.

**Table 4.5-2: RFFA Air Quality Emissions within a 50 Kilometer Radius of the Project Area**

Cumulative Emissions (tpy)							
Emission Sources	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC
<b>Gemfield Project</b>	1,079.87	389.71	44.53	483.95	1.48	428.15	36.83

4.5.1.1 Proposed Action

Impacts to air quality from the Proposed Action would be limited to particulate and combustion emissions and fugitive dust, as well as HAPs and GHGs. The incremental contribution of the Proposed Action’s particulate and combustion emissions and fugitive dust to the cumulative air quality environment would be relatively small compared to the existing cumulative air quality environment and the cumulative emissions are generally dispersed. Table 4.5-3 shows the portion of the total permitted emissions. Stationary sources would be regulated by the NDEP BAPC under individual permits to ensure that impacts would be reduced to levels that are consistent with the ambient air quality standards. ACEPMs outlined in Section 2.1.11 help minimize the potential effects of fugitive dust on air quality.

**Table 4.5-3: Total Air Quality Emissions within a 50 Kilometer Radius of the Project Area**

Cumulative Emissions (tpy)							
Emission Sources	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	CO	VOC
<b>Facilities</b>	1,179.82	498.11	107.93	573.57	89.50	480.57	70.21
<b>Roads/Vehicles</b>	621.71	621.71	571.51	15,943.57	49.77	8,865.52	694.10
<b>Total</b>	1,801.53	1,119.83	679.44	16,517.14	139.27	9,346.09	764.31
<b>Project Total</b>	397.8	115.93	14.54	96.15	3.23	175.77	5.04
<b>Proposed Project's contribution</b>	18.09%	9.38%	2.10%	0.58%	2.27%	1.85%	0.66%

4.5.1.2 Powerline Alternative

Under the Powerline Alternative, the Project operations would be similar to the Proposed Action, except the construction disturbance and associated fugitive dust and combustion emissions would increase slightly due to construction of the powerline to the Project. During the operation of the mine the power demand would be provided by the electrical grid and the on-site power generation would not be needed. The Powerline Alternative would not result in air quality impacts greater than the ambient air quality standards. The Powerline Alternative would have a smaller incremental impact to the cumulative air quality relative to the Proposed Action.

#### 4.5.1.3 On-Site Water Alternative

Under the On-Site Water Alternative, the Project operations would be essentially the same as under the Proposed Action, except the construction disturbance and associated fugitive dust and combustion emissions would be slightly less due to elimination of the pipeline from the Project north to the Town of Tonopah water connection. Under this alternative there would be some additional construction activities and associated fugitive dust and combustion emissions with the water well construction and water tanks installation. During the operation of the mine the power demand for the water well would increase to load requirements on the generator used for on-site power generation. This additional power demand would be able to be met by the planned generator. The modeling completed for the Proposed Action used the generator at full load; therefore, the Proposed Action model is representative of the potential air quality impacts associated with the operational phase under the On-Site Water Alternative. The On-Site Water Alternative would not result in air quality impacts greater than the ambient air quality standards. The On-Site Water Alternative would have a similar incremental impact to the cumulative air quality relative to the Proposed Action.

#### 4.5.1.4 Knapp Avenue Access Only Alternative

Under the Knapp Avenue Access Only Alternative, the Project operations would be essentially the same as under the Proposed Action, except the fugitive dust and combustion emissions associated with the Project access would be slightly less due to elimination of the South Road access. Since the emissions under this alternative would be slightly less than under the Proposed Action, the Proposed Action model is representative of the potential air quality impacts associated with the operational phase under the Knapp Avenue Access Only Alternative. The Knapp Avenue Access Only Alternative would not result in air quality impacts greater than the ambient air quality standards. The Knapp Avenue Access Only Alternative would have a similar incremental impact to the cumulative air quality relative to the Proposed Action.

#### 4.5.1.5 No Action Alternative

Under the No Action Alternative, incremental cumulative impacts to air quality within the CESA would result from past, present, and RFFAs; however, the incremental contribution of this alternative would be substantially less than the Proposed Action because there would only be a limited amount of exploration activities. The cumulative emissions are generally dispersed and the stationary sources would be regulated by the BAPC to ensure impacts would be reduced to levels consistent with the ambient air quality standards.

### **4.5.2 Cultural Resources**

The CESA for direct effects to cultural resources is the Project Area. The Project Area encompasses approximately 722 acres and is shown on Figure 1.1.1.

*Past and Present Actions:* Past and present actions that could have impacted and may be currently impacting cultural resources include livestock grazing, ROW construction and maintenance, mineral exploration, mining, and dispersed recreation.

*RFFAs*: Potential impacts to direct effects to cultural resources from wildland fires, ROW construction and maintenance, mineral exploration, and mining are expected to continue.

#### 4.5.2.1 Proposed Action

As discussed in Section 3.3.2.1, there would be no adverse effects to significant cultural resources from activities associated with the Proposed Action, as there were no sites or isolates within the area surveyed that were considered eligible for the NRHP. In addition, any inadvertent discoveries of previously undetected cultural resources would be treated as required under 43 CFR 10.4 and 43 CFR 3809.420(8)(b). Therefore, there would be no direct incremental cumulative impacts to significant cultural resources from activities associated with the Proposed Action.

#### 4.5.2.2 Powerline Alternative

Under the Powerline Alternative, the Project would be constructed and operated in the same manner as the Proposed Action. In addition, the disturbance area proposed for the powerline is located within the disturbance area associated with the mine. Therefore, similar to the Proposed Action, there would be no direct incremental cumulative impacts to significant cultural resources from activities under this alternative.

#### 4.5.2.3 On-Site Water Alternative

Under the On-Site Water Alternative, the Project would be constructed and operated in the same manner as the Proposed Action. In addition, the disturbance area proposed for the on-site water source is located within the disturbance area associated with the mine. Therefore, similar to the Proposed Action, there would be no direct incremental cumulative impacts to significant cultural resources from activities under this alternative.

#### 4.5.2.4 Knapp Avenue Access Only Alternative

Under the Knapp Avenue Access Only Alternative, the Project would be constructed and operated in the same manner as the Proposed Action. Therefore, similar to the Proposed Action, there would be no direct incremental cumulative impacts to significant cultural resources from activities under this alternative.

#### 4.5.2.5 No Action Alternative

Under the No Action Alternative, Notice-level exploration activities could continue. Similar to the Proposed Action, there would be no adverse effects to significant cultural resources from activities associated with the No Action Alternative, as there were no sites or isolates within the area surveyed that were considered eligible for the NRHP. In addition, any inadvertent discoveries of previously undetected cultural resources would be treated as required under 43 CFR 10.4 and 43 CFR 3809.420(8)(b). Therefore, there would be no incremental cumulative impacts to significant cultural resources from activities associated with the No Action Alternative.

### 4.5.3 Geology and Mineral Resources

The CESA for geology and mineral resources is the Geology CESA. This CESA encompasses approximately 27,681 acres and is shown on Figure 4.2.3.

*Past and Present Actions:* Past and present actions that may have impacted or are currently impacting geology and minerals include primarily mining-related actions. Most past mineral operations within the CESA consisted of underground mining operations. Present actions include very small mineral exploration activities and mineral material disposal sites. Most of the past and present surface disturbance from mining-related actions within the Geology CESA is associated with the mining activities in the Tonopah Mining District, which the Town of Tonopah has been developed around. The past and present disturbance totals approximately 893 acres; however, impacts to geology and mineral resources primarily occur by excavating, modifying, or covering existing topographic and geomorphic features and by removing mineral resources, which totaled approximately \$150 million in gold and silver (approximately \$1,790,000,000 inflation adjusted to current dollars) (Kleinhampl and Zoyny 1984).

*RFFAs:* Except for the Proposed Action, there are no specifically identified RFFAs that would be occurring within the Geology and Mineral Resources CESA.

#### 4.5.3.1 Proposed Action

The Proposed Action would include mining at an average rate of approximately 45,000 tons per day, with a maximum mining rate of 100,000 tons per day. A total of up to 16 Mt of ore would be mined and approximately 0.567 million ounces of gold produced under the Proposed Action. The Proposed Action would be approximately 34 percent of the total mining-related past, present, and RFFA disturbance, and approximately 26 percent of the estimated past, present, and RFFA mineral value produced, based on the historic production values and the WKM value for the Project ounces produced (WKM 2015) at a gold price of \$1,150 per ounce.

#### 4.5.3.2 Powerline Alternative

Mining would occur at the same rate and amount under the Powerline Alternative as under the Proposed Action. Therefore, cumulative impacts under the Powerline Alternative would be the same as under the Proposed Action.

#### 4.5.3.3 On-Site Water Alternative

Mining would occur at the same rate and amount under the On-Site Water Alternative as under the Proposed Action. Therefore, cumulative impacts under the On-Site Water Alternative would be the same as under the Proposed Action.

#### 4.5.3.4 Knapp Avenue Access Only Alternative

Mining would occur at the same rate and amount under the Knapp Avenue Access Only Alternative as under the Proposed Action. Therefore, cumulative impacts under the Knapp Avenue Access Only Alternative would be the same as under the Proposed Action.

#### 4.5.3.5 No Action Alternative

Under the No Action Alternative, impacts associated with geology and mineral resources from the Proposed Action would not occur. As there would be no open pit permitted under the No Action Alternative, WKM would not extract the ore associated with the Proposed Action, which would leave valuable resources in the ground that would not be distributed to commerce. As a result, approximately \$655,500,000 in mineral wealth would not be developed. Notice-level exploration activities could continue under the No Action Alternative; however, the removal of core samples associated with exploration activities would not be considered a viable cumulative impact to geology and mineral resources.

#### 4.5.4 **Lands and Realty**

The CESA for lands and realty is the Range CESA. This CESA encompasses approximately 98,372 acres and is shown on Figure 4.2.3.

*Past and Present Actions:* Past and present actions that could have impacted or may be currently impacting lands and realty include ROWs, such as roads and highways, powerlines, communication sites, telecommunications, and water facilities, and mining and mineral exploration activities. Quantifiable past and present actions in the Range CESA that could have restricted access or changed land uses total approximately 8,667 acres.

*RFFAs:* Potential impacts to lands and realty from ROWs and mining activities are expected to continue. There are approximately 458 acres of pending minerals projects identified in the CESA, which is the proposed Project, and approximately ten acres of pending ROW projects identified in the Range CESA.

##### 4.5.4.1 Proposed Action

The Proposed Action includes an approximate 480-acre fence boundary, which would restrict public access to the Project Area, and would impact access to approximately 0.5 percent of the CESA. In addition, quantifiable past and present actions and RFFA disturbance in the Range CESA that have restricted access or would restrict access and change land uses total approximately 9,115 acres, which results in an incremental impact from the fenced-in portion of the Proposed Action of approximately five percent. Since there are limited quantifiable data for all activities in the CESA, this calculation is a conservative analysis of the potential incremental impact of the Proposed Action. There would be a long-term change of land use with the reduction of 75 acres of public land due to the open pit not being reclaimed; however, Project-related access and land use impacts would be minimized due to the reclamation of the remaining mining facilities and removal of the fence. Therefore, based on the above analysis and findings, incremental impacts to lands and realty as a result of the Proposed Action, when combined with the impacts from the past and present actions and RFFAs, are expected to be minimal.

##### 4.5.4.2 Powerline Alternative

A total of the quantifiable past and present actions and RFFA disturbances in the Range CESA that have restricted access or would restrict access and change land uses total approximately

9,115 acres, which results in an impact to approximately nine percent of the CESA. This alternative (approximately 539 acres) would result in an incremental impact of approximately six percent. There would be a long-term change of land use with the reduction of 75 acres of public land due to the open pit not being reclaimed and with the installation of the powerline; however, Project-related access and land use impacts would be minimized due to the reclamation of the remaining mining facilities and temporary disturbance associated with powerline construction, and removal of the fence. Therefore, incremental impacts to lands and realty as a result of this alternative, when combined with the impacts from the past and present actions and RFFAs, are expected to be minimal.

#### 4.5.4.3 On-Site Water Alternative

A total of the quantifiable past and present actions and RFFA disturbances in the Range CESA that have restricted access or would restrict access and change land uses total approximately 9,115 acres, which is an impact to approximately nine percent of the CESA. This alternative (approximately 453 acres) would result in an incremental impact of approximately five percent. There would be a long-term change of land use with the reduction of 75 acres of public land due to the open pit not being reclaimed; however, Project-related access and land use impacts would be minimized due to the reclamation of the remaining mining facilities and removal of the fence. Therefore, incremental impacts to lands and realty as a result of this alternative, when combined with the impacts from the past and present actions and RFFAs, are expected to be minimal.

#### 4.5.4.4 Knapp Avenue Access Only Alternative

Under the Knapp Avenue Access Only Alternative, the development and operation of the Project would be similar to the Proposed Action, with the exception of the reduction of one acre of disturbance associated with the construction of the US Highway 95/South Access Road acceleration/deceleration lanes. Therefore, the incremental cumulative impacts under this alternative would be similar to the incremental cumulative impacts under the Proposed Action.

#### 4.5.4.5 No Action Alternative

A total of the quantifiable past and present actions and RFFA disturbances in the Range CESA that have restricted access or would restrict access and change land uses total approximately 8,656 acres, which results in an incremental impact to approximately nine percent of the CESA. This alternative (approximately five acres for exploration) would result in an incremental impact of less than one percent. There would be no long-term land use and access issues, as there would be no open pit associated with this alternative. Therefore, incremental impacts to lands and realty as a result of this alternative, when combined with the impacts from the past and present actions and RFFAs, are expected to be minimal.

### **4.5.5 Migratory Birds**

The CESA for migratory birds is the Recreation/Wildlife CESA. This CESA encompasses approximately 303,699 acres and is shown on Figure 4.2.3.

*Past and Present Actions:* Past and present actions that could have impacted and may be currently impacting migratory birds and their habitat include livestock grazing, wildlife habitat

management, dispersed recreation, ROW construction and maintenance, mineral exploration, and mining. Impacts to migratory birds and their habitat have resulted from the following: 1) indirect impacts from the destruction of habitat associated with building roads and clearing vegetation; 2) indirect impacts from the disruption from human presence or noise; or 3) direct impacts or harm to migratory birds that result if trees and shrubs containing viable nests were cut down or ground nests destroyed by construction or ranching equipment. There are no specific data that quantify impacts to migratory birds and their habitat as a result of livestock grazing or dispersed recreation. Impacts to migratory birds from livestock grazing include trampling of vegetation or nesting areas near streams, springs, or riparian areas within the Recreation/Wildlife CESA. Impacts to migratory birds and their habitat from recreation activities include destruction of native vegetation or nesting areas from off-road vehicles that traveled off of established roadways.

Authorized and closed mineral exploration and mining Notices or plans of operations, as well as mineral material disposal sites, total approximately 568 acres (approximately 0.02 percent of the CESA) of surface disturbance. Approximately 15,730 acres of ROWs were issued within the Recreation/Wildlife CESA that had the potential to create surface disturbance and disturb migratory bird habitat and vegetation. The CESA is also comprised of the NDOW Hunt Units 161, 162, 171, 173, 211, 212, and 251, which have the potential to create noise and disturbance to migratory birds, or remove or alter habitat. The Recreation/Wildlife CESA encompasses portions of the following grazing allotments: Monte Cristo; Montezuma; Ralston; San Antone; Sheep Mountain; and Silver King. Livestock grazing and associated management could have contributed to the establishment and spread of noxious weeds, invasive and non-native species, which could have had an indirect effect on migratory birds and their habitat. However, disturbance to migratory birds and their habitat from past and present actions would have been reduced through reclamation and seeding of disturbed areas and natural recolonization of native species. The past and present actions that are quantifiable have disturbed approximately five percent of the CESA. There are no data on the number of acres reclaimed. State and federal regulations require reclamation; therefore, it is reasonable to assume that some areas have been reclaimed, become naturally stabilized, or have naturally revegetated over time.

*RFFAs:* Potential impacts to migratory birds and their habitat from livestock grazing, dispersed recreation, wildlife habitat management, ROW construction and maintenance, mineral exploration, mining, or loss of native vegetation associated with potential wildland fires could occur. There are no specific data to quantify impacts to migratory birds or their habitat within the CESA as a result of livestock grazing, dispersed recreation, wildlife habitat management, or potential wildland fires. There are approximately 458 acres of pending minerals projects identified in the CESA, which is the proposed Project, and approximately 15 acres of pending ROW projects identified in the Recreation/Wildlife CESA. The pending minerals projects are all required to incorporate protection measures for migratory birds and therefore, are not expected to directly harm migratory birds, but may result in habitat removal or alteration.

#### 4.5.5.1 Proposed Action

The Proposed Action (approximately 384 acres of temporary nesting and/or foraging habitat removal, not including the 75 acres of the open pit that would not be reclaimed) would impact approximately 0.1 percent of the CESA. Quantifiable past and present actions and RFFA disturbance in the Recreation/Wildlife CESA total approximately 16,751 acres, which results in

an incremental impact from the Proposed Action of approximately three percent. Since there are limited quantifiable data for all activities in the CESA, this calculation is a conservative analysis of the potential incremental impact of the Proposed Action. Project-related impacts would be localized and minimized due to implementation of the ACEPMs outlined in Section 2.1.11 and reclamation. In addition, the unreclaimed open pit could potentially provide additional nesting habitat for raptors. Therefore, based on the above analysis and findings, incremental impacts to migratory birds and their habitat as a result of the Proposed Action, when combined with the impacts from the past and present actions and RFFAs, are expected to be minimal.

#### 4.5.5.2 Powerline Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Recreation/Wildlife CESA is approximately 16,751 acres, which is an impact to approximately six percent of the CESA. This alternative (approximately 539 acres) would result in an incremental impact of approximately three percent. Impacts to migratory birds and their habitat from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### 4.5.5.3 On-Site Water Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Recreation/Wildlife CESA is approximately 16,751 acres, which is an impact to approximately six percent of the CESA. This alternative (approximately 453 acres) would result in an incremental impact of approximately three percent. Impacts to migratory birds and their habitat from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### 4.5.5.4 Knapp Avenue Access Only Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Recreation/Wildlife CESA is approximately 16,751 acres, which is an impact to approximately six percent of the CESA. This alternative (approximately 458 acres) would result in an incremental impact of approximately three percent. Impacts to migratory birds and their habitat from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### 4.5.5.5 No Action Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Recreation/Wildlife CESA is approximately 16,293 acres, which is an impact to approximately five percent of the CESA. This alternative (approximately five acres) would result in an incremental impact of approximately 0.03 percent. Impacts to migratory birds and their habitat from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### **4.5.6 Noise**

The CESA for noise is the Noise CESA. This CESA encompasses approximately 3,894 acres and is shown on Figure 3.9.1.

*Past and Present Actions:* Any potential impacts from past actions from noise would not persist, since any impacts would have been short term in nature and would not carry forward to the present. Therefore, there are no past noise actions relevant to this analysis. Present actions that may be currently impacting the environment from noise primarily include traffic on area roadways and temporary noise from construction equipment.

*RFFAs:* Potential impacts to noise from traffic on area roadways and construction equipment are expected to continue.

##### **4.5.6.1 Proposed Action**

The Proposed Action could contribute to the cumulative noise environment by increasing traffic noise on area roadways, increasing temporary construction noise, and creating noise from blasting activities, as well as equipment and the generator. Since noise from construction and blasting activities associated with the Proposed Action would be temporary in duration and sporadic, those activities would not be considered to have an incremental cumulative impact on the existing noise environment. The impacts from increased traffic noise on area roadways would also be sporadic in nature.

##### **4.5.6.2 Powerline Alternative**

Under the Powerline Alternative, there would be a minor temporary increase in construction noise due to the construction and installation of the powerline, but a decrease in noise from the absence of the generator. Impacts from an increase in construction noise would be sporadic and temporary in duration, so would not be considered to have an incremental cumulative impact on the existing noise environment. Therefore, cumulative impacts from noise under this alternative would be similar to the impacts under the Proposed Action.

##### **4.5.6.3 On-Site Water Alternative**

Under the On-Site Water Alternative, there would be a minor decrease in temporary construction noise due to the elimination of the water line, but a minor increase in temporary construction noise due to the drilling of the production well. However, these impacts would be sporadic and temporary in duration, so would not be considered to have an incremental cumulative impact on the existing noise environment. Therefore, cumulative impacts from noise under this alternative would be similar to the impacts under the Proposed Action.

##### **4.5.6.4 Knapp Avenue Access Only Alternative**

Under the Knapp Avenue Access Only Alternative, development and operation of the Project would remain the same as the Proposed Action, with the exception of the noise associated with vehicle travel would be focused on Knapp Avenue. However, these impacts would be temporary and sporadic, so would not be considered to have an incremental cumulative impact on the

existing noise environment. Therefore, cumulative impacts from noise under this alternative would be similar to the impacts under the Proposed Action.

#### 4.5.6.5 No Action Alternative

Under the No Action Alternative, there would be no noise associated with blasting activities. In addition, the minor amount of noise produced by drilling equipment would be temporary, sporadic, and localized around the disturbance areas, so would not be considered to have an incremental cumulative impact on the existing noise environment. Therefore, cumulative impacts from noise under this alternative would be similar type to but less in magnitude than the impacts under the Proposed Action.

### 4.5.7 **Noxious Weeds, Invasive and Non-Native Species**

The CESA for noxious weeds, invasive and non-native species is the Watershed CESA. This CESA encompasses approximately 165,759 acres and is shown on Figure 4.2.2.

*Past and Present Actions:* Past and present actions with impacts created from noxious weeds, invasive and non-native species include livestock grazing, wildlife habitat management, ROW construction and maintenance, mineral exploration, mining, and dispersed recreation. These actions could have disturbed vegetation and soils creating an opportunity for invasive plant colonization and the introduction of noxious weeds, invasive or non-native species seeds. There are no specific data to quantify impacts from noxious weeds, invasive and non-native species that resulted from livestock grazing, wildlife habitat management, or dispersed recreation.

Authorized and closed mineral exploration and mining Notices and plans of operations, as well as mineral material disposal sites, total approximately 763 acres (approximately 0.5 percent of the CESA) of surface disturbance. Approximately 12,610 acres of ROWs were issued within the Watershed CESA that had the potential to introduce noxious weeds, invasive and non-native species. The CESA includes NDOW Hunt Units 161, 162, 171, 173, 211, 212, and 251. The activities associated with hunting have the potential to create surface disturbance and associated off road vehicular traffic, which can introduce noxious weeds, invasive and non-native species. The Watershed CESA encompasses the following grazing allotments: Monte Cristo; Montezuma; Ralston; San Antone; Sheep Mountain; and Silver King. Livestock grazing and associated management contributes to the spread of noxious weeds, invasive and non-native species. The past and present actions that are quantifiable have disturbed approximately eight percent of the CESA.

*RFFAs:* Potential impacts from noxious weeds, invasive and non-native species as a result of livestock grazing, wildlife habitat management, ROW construction and maintenance, mineral exploration, mining, dispersed recreation and potential wildland fire are expected to continue. There are no specific data to quantify impacts from noxious weeds, invasive and non-native species as result of livestock grazing, wildlife habitat management, dispersed recreation, or potential wildland fires. There are approximately 458 acres of pending minerals projects identified in the CESA, which is the proposed Project, and no pending ROW projects identified in the Watershed CESA.

#### 4.5.7.1 Proposed Action

The Proposed Action (approximately 459 acres) would impact approximately 0.3 percent of the CESA. Quantifiable past and present actions and RFFA disturbance in the Watershed CESA is approximately 13,831 acres, which results in an incremental impact from the Proposed Action of approximately three percent. Since there are limited quantifiable data for all activities within the CESA, this calculation is a conservative analysis of the potential incremental impact of the Proposed Action. Project-related impacts would be minimized due to implementation of the ACEPMs outlined in Section 2.1.11 and reclamation. Therefore, based on the above analysis and findings, incremental impacts from noxious weeds, invasive, and non-native species as a result of the Proposed Action, when combined with the impacts from the past and present actions and RFFAs, would be minimal.

#### 4.5.7.2 Powerline Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Watershed CESA is approximately 13,831 acres, which is an impact to approximately eight percent of the CESA. This alternative (approximately 539 acres) would result in an incremental impact of approximately four percent. Impacts from noxious weeds, invasive and non-native species from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### 4.5.7.3 On-Site Water Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Watershed CESA is approximately 13,831 acres, which is an impact to approximately eight percent of the CESA. This alternative (approximately 453 acres) would result in an incremental impact of approximately three percent. Impacts from noxious weeds, invasive and non-native species from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### 4.5.7.4 Knapp Avenue Access Only Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Watershed CESA is approximately 13,831 acres, which is an impact to approximately six percent of the CESA. This alternative (approximately 458 acres) would result in an incremental impact of approximately three percent. Impacts to migratory birds and their habitat from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### 4.5.7.5 No Action Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Watershed CESA is approximately 13,373 acres, which is an impact to approximately eight percent of the CESA. This alternative (approximately five acres) would result in an incremental impact of approximately 0.04 percent. Impacts from noxious weeds, invasive and non-native species from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### **4.5.8 Public Safety**

The CESA for public safety is the Transportation CESA. This CESA is defined as the roadway network affected by the Project and is shown on Figure 4.2.4.

*Past and Present Actions:* Past and present actions that could have impacted and may currently be impacting public safety include those actions centered on the movement of people and goods, as well as improvements to the transportation network. Actions involving the movement of goods and people include livestock grazing, minerals development, land development, and general road and highway travel.

*RFFAs:* Increased traffic due to new resource development projects and population increases.

##### **4.5.8.1 Proposed Action**

The existing public safety associated with the transportation network within and surrounding the Project Area is similar to the existing network throughout the CESA. Most of the incremental cumulative impacts associated with the Proposed Action would be temporary, since the Project traffic and associated public safety issues would cease when the Project ended. The Proposed Action would increase traffic levels on area roadways, as discussed in Section 3.18 and affect public safety, as outlined in Section 3.12, and may result in incremental cumulative impacts within the CESA. However, the increased traffic would cease once Project activities end, so would result in a negligible short-term incremental cumulative impact.

##### **4.5.8.2 Powerline Alternative**

Under the Powerline Alternative, the transportation network within and surrounding the Project Area would not change relative to the Proposed Action; however, there would be a small influx of workers associated with the construction of the powerline, which would bring additional traffic and thus public safety issues into the area. The incremental cumulative impacts under this alternative would be minor and temporary, but similar in nature to the incremental cumulative impacts under the Proposed Action.

##### **4.5.8.3 On-Site Water Alternative**

Under the On-Site Water Alternative, the transportation network within and surrounding the Project Area would not change; therefore, the incremental cumulative impacts under this alternative would be similar in nature to the incremental cumulative impacts under the Proposed Action.

##### **4.5.8.4 Knapp Avenue Access Only Alternative**

Under the Knapp Avenue Access Only Alternative, the transportation network within and surrounding the Project Area would not change; however, the use of the network and thus public safety under this alternative would be different than the Proposed Action, as outlined in Section 3.12. The incremental cumulative impacts under this alternative would be minor and temporary, but similar in nature to the incremental cumulative impacts under the Proposed Action.

#### 4.5.8.5 No Action Alternative

Under the No Action Alternative, the Three Hills Mine would not be approved and therefore not result in impacts to the existing transportation network within and surrounding the Project Area. There would be a few vehicles traveling on area roadways associated with the Notice-level exploration activities. Therefore, the No Action Alternative's incremental cumulative impact when added to past and present actions and RFFAs, would be minimal.

#### **4.5.9 Rangeland Management**

The CESA for Rangeland Management is the Range CESA. This CESA encompasses approximately 98,372 acres and is shown on Figure 4.2.3.

*Past and Present Actions:* Past and present actions that could have impacted and may be currently impacting rangeland management include wildlife habitat management, ROW construction and maintenance, mineral exploration, mining, and dispersed recreation. There are no specific data to quantify impacts from wildlife habitat management or dispersed recreation. Building of sumps, fences or other linear features, or off-road traveling could have destroyed habitat or disrupted the movement of grazing animals.

Authorized and closed mineral exploration and mining Notices and plans of operations, as well as mineral material disposal sites, total approximately 733 acres (approximately 0.7 percent of the CESA) of surface disturbance. Approximately 7,934 acres of ROWs were issued within the Range CESA that had the potential to affect livestock movement and disturb habitat. The past and present actions that are quantifiable have disturbed approximately nine percent of the CESA.

*RFFAs:* Potential impacts to rangeland management from wildlife habitat management, ROW construction and maintenance, mineral exploration, mining, dispersed recreation, and potential wildland fire could occur. There are no specific data to quantify impacts to rangeland management within the CESA as a result of wildlife habitat management, dispersed recreation, or potential wildland fires. There are approximately 458 acres of pending minerals projects identified in the CESA, which is the proposed Project, and approximately ten acres of pending ROW projects identified in the Range CESA.

##### 4.5.9.1 Proposed Action

The Proposed Action includes an approximate 480-acre fence boundary, which would restrict access to livestock, and would impact approximately 0.5 percent of the CESA. Quantifiable past and present actions and RFFA disturbance in the Range CESA total approximately 9,125 acres, which results in an incremental impact from the fenced-in portion of the Proposed Action of approximately five percent. Since there are limited quantifiable data for all activities in the CESA, this calculation is a conservative analysis of the potential incremental impact of the Proposed Action. Project-related impacts would be minimized due to the reclamation of the mining facilities and removal of the fence. Therefore, based on the above analysis and findings, incremental impacts to rangeland management as a result of the Proposed Action, when combined with the impacts from the past and present actions and RFFAs, are expected to be minimal.

#### 4.5.9.2 Powerline Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Range CESA is approximately 9,125 acres, which is an impact to approximately nine percent of the CESA. This alternative (approximately 480 acres of a fenced-in area) would result in an incremental impact of approximately five percent, which is the same incremental impact as the Proposed Action, as the majority of the disturbance associated with the powerline would be primarily conducted outside the fence boundary. Impacts to rangeland management from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### 4.5.9.3 On-Site Water Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Range CESA is approximately 9,125 acres, which is an impact to approximately nine percent of the CESA. This alternative (approximately 480 acres of a fenced-in area) would result in an incremental impact of approximately five percent, which is the same incremental impact as the Proposed Action, as the water line would be buried under the Proposed Action, so the presence of the fence would not result in any additional cumulative impacts under this alternative. Impacts to rangeland management from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### 4.5.9.4 Knapp Avenue Access Only Alternative

Under the Knapp Avenue Access Only Alternative, the development and operation of the Project would be similar to the Proposed Action, with the exception of the reduction of one acre of disturbance associated with the construction of the US Highway 95/South Access Road acceleration/deceleration lanes. Therefore, the incremental cumulative impacts under this alternative would be the same as the incremental cumulative impacts under the Proposed Action.

#### 4.5.9.5 No Action Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Range CESA is approximately 8,667 acres, which is an impact to approximately nine percent of the CESA. This alternative (approximately five acres) would result in an incremental impact of approximately 0.06 percent. Impacts to rangeland management from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

### **4.5.10 Recreation**

The CESA for recreation is the Recreation/Wildlife CESA. This CESA encompasses approximately 303,699 acres and is shown on Figure 4.2.3.

*Past and Present Actions:* Past and present actions that could have impacted and may be currently impacting recreation include ROW construction and maintenance, mineral exploration, and urban development. Impacts to recreation from these activities include restrictions on access to recreational areas, noise, alterations to visual characteristics and impacts to night skies, and loss or displacement of wildlife. Authorized and closed mineral exploration and mining Notices

or plans of operations, as well as mineral material disposal sites, total approximately 568 acres (approximately 0.2 percent of the CESA) of surface disturbance. Approximately 15,730 acres of ROWs were issued within the Recreation/Wildlife CESA that had the potential to create surface disturbance and cause access, noise, and visual impacts to recreation.

*RFFAs:* Potential impacts to recreation from ROW construction and maintenance, mineral exploration, mining, or loss of native vegetation associated with potential wildland fires could occur. There are no specific data to quantify impacts to recreation within the CESA as a result of potential wildland fires. There are approximately 458 acres of pending minerals projects identified in the CESA, which is the proposed Project, and approximately 15 acres of pending ROW projects identified in the Recreation/Wildlife CESA. These projects would create surface disturbance and potentially cause access, noise, and visual impacts to recreation.

#### 4.5.10.1 Proposed Action

The Proposed Action includes an approximate 480-acre fence boundary, which would restrict access to recreational users, and would impact approximately 0.2 percent of the CESA. Quantifiable past and present actions and RFFA disturbance in the Recreation/Wildlife CESA total approximately 16,751 acres, which results in an incremental impact from the fenced-in portion of the Proposed Action of approximately three percent. Since there are limited quantifiable data for all activities in the CESA, this calculation is a conservative analysis of the potential incremental impact of the Proposed Action. Project-related impacts would be minimized due to the reclamation of the mining facilities and removal of the fence. Therefore, based on the above analysis and findings, incremental impacts to recreation as a result of the Proposed Action, when combined with the impacts from the past and present actions and RFFAs, are expected to be minimal.

#### 4.5.10.2 Powerline Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Recreation/Wildlife CESA is approximately 16,751 acres, which is an impact to approximately six percent of the CESA. This alternative (approximately 480 acres of a fenced-in area) would result in an incremental impact of approximately three percent, which is the same incremental impact as the Proposed Action, as all disturbance associated with the powerline would be primarily conducted outside the fence boundary. Impacts to recreation from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### 4.5.10.3 On-Site Water Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Recreation/Wildlife CESA is approximately 16,751 acres, which is an impact to approximately six percent of the CESA. This alternative (approximately 480 acres of a fenced-in area) would result in an incremental impact of approximately three percent, which is the same incremental impact as the Proposed Action, since the water line would be buried, so the presence of the fence would not result in any additional cumulative impacts under this alternative. Impacts to recreation from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### 4.5.10.4 Knapp Avenue Access Only Alternative

Under the Knapp Avenue Access Only Alternative, the development and operation of the Project would be similar to the Proposed Action, with the exception of the reduction of one acre of disturbance associated with the construction of the US Highway 95/South Access Road acceleration/deceleration lanes. Therefore, the incremental cumulative impacts under this alternative would be the same as the incremental cumulative impacts under the Proposed Action.

#### 4.5.10.5 No Action Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Recreation/Wildlife CESA is approximately 16,293 acres, which is an impact to approximately five percent of the CESA. This alternative (approximately five acres) would result in an incremental impact of approximately 0.03 percent. Impacts to recreation from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

### **4.5.11 Socioeconomics**

The CESA for socioeconomics is the Socioeconomics CESA. This CESA encompasses approximately 4,214,806 acres and is shown on Figure 3.15.1.

*Past and Present Actions:* Past and present actions that could have impacted and may be currently impacting socioeconomics include livestock grazing, ROW construction and maintenance including solar energy development such as the Crescent Dunes Solar Energy Project, recreation, and mineral exploration and mining. Impacts to socioeconomics from these activities include increased population, increased demand for public services, increased employment opportunities, increased demand for available housing, increased revenues for the communities within the CESA, and increased expenditures by the communities within the CESA. The extent of these impacts vary with the type of activity and have not been quantified; however, the majority of the impacts from past and present activities do not have any ongoing impacts and are considered to be part of the existing social and economic climate within the CESA.

*RFFAs:* Potential impacts to socioeconomics from livestock grazing, ROW construction and maintenance, recreation, mineral exploration and mining, and potential wildland fires could occur. Specific projects that are planned mainly include mining projects, as described in Section 4.4.

#### 4.5.11.1 Proposed Action

Based on the proposed maximum employment of 100 workers over an approximate eight-year period, it is unlikely that the proposed Project would result in measurable changes to housing demand, public facilities and services, emergency and health care services, or public education. Anticipated schedules for increases or decreases in employment for RFFAs in the CESA are not known. However, the anticipated use of existing local workers for the additional employment needed for the Proposed Action indicates a modest positive contribution to economic effects, with minimal to no measurable additional demand for housing or public facilities and services, and minimal effect on cumulative employment and associated impacts. If non-local contact

workers are required for the Proposed Action, the 100 workers would represent a minimal short-term incremental increase in the cumulative demand for housing and public facilities and services. Therefore, the Proposed Action would not induce substantial growth or a concentration of population, displace a large number of people, cause a substantial reduction in employment, reduce wage and salary earnings, cause a substantial net increase in county expenditures, or create a substantial demand for public services. Whether the contact workers are local or non-local, the incremental social and economic effects would be minor in the context of the economy of the CESA.

#### 4.5.11.2 Powerline Alternative

Under the Powerline Alternative, the maximum number of workers at the Project would not change; however, there would be a small influx of workers associated with the construction of the powerline, which would bring additional revenue into the area. The incremental cumulative impacts under this alternative would be minor and temporary, but similar in nature to the incremental cumulative impacts under the Proposed Action.

#### 4.5.11.3 On-Site Water Alternative

Under the On-Site Water Alternative, the maximum number of workers at the Project would not change; therefore, the incremental cumulative impacts under this alternative would be similar in nature to the incremental cumulative impacts under the Proposed Action.

#### 4.5.11.4 Knapp Avenue Access Only Alternative

Under the Knapp Avenue Access Only Alternative, the maximum number of workers at the Project would not change; therefore, the incremental cumulative impacts under this alternative would be similar in nature to the incremental cumulative impacts under the Proposed Action.

#### 4.5.11.5 No Action Alternative

Under the No Action Alternative, the Three Hills Mine would not be approved and, therefore, not have the beneficial impacts in the CESA associated with the Proposed Action. Therefore, the No Action Alternative's incremental cumulative impact when added to past and present actions and RFFAs, are expected to be minimal.

### **4.5.12 Soils**

The CESA for soils is the Watershed CESA. This CESA encompasses approximately 165,759 acres and is shown on Figure 4.2.2.

*Past and Present Actions:* Past and present actions that could have impacted and may be currently impacting soils include livestock grazing, wildlife habitat management, ROW construction and maintenance, mineral exploration, mining, dispersed recreation, and soil compaction due to travel by heavy equipment on unpaved roads. These actions may have directly disturbed or impacted soils, or increased erosion or sedimentation potential. Impacts from these activities include loss of soils productivity due to changes in soil physical properties, soil fertility, soil movement in response to water and wind erosion, and loss of soil structure due to

compaction. There are no specific data to quantify impacts to soils from livestock grazing, wildlife habitat management, and dispersed recreation.

Authorized and closed mineral exploration and mining Notices and plans of operations, as well as mineral material disposal sites, total approximately 763 acres (approximately 0.5 percent of the CESA) of surface disturbance. Approximately 12,610 acres of ROWs were issued within the Watershed CESA that had the potential to create surface disturbance. The CESA includes NDOW Hunt Units 161, 162, 171, 173, 211, 212, and 251. The activities associated with hunting have the potential to create surface disturbance and associated off road vehicular traffic, which could have contributed to soil compaction of unpaved roads. The past and present actions that are quantifiable have disturbed approximately eight percent of the CESA.

*RFFAs:* Potential impacts to soils as a result of livestock grazing, wildlife habitat management, ROW construction and maintenance, mineral exploration, mining, dispersed recreation and potential wildland fire are expected to continue. There are no specific data to quantify impacts to soils as a result of livestock grazing, wildlife habitat management, dispersed recreation, or potential wildland fires. There are approximately 458 acres of pending minerals projects identified in the CESA, which is the proposed Project, and no pending ROW projects identified in the Watershed CESA.

#### 4.5.12.1 Proposed Action

The Proposed Action (approximately 459 acres) would impact approximately 0.3 percent of the CESA. Quantifiable past and present actions and RFFA disturbance in the Watershed CESA is approximately 13,811 acres, which results in an incremental impact from the Proposed Action of approximately three percent. Since there are limited quantifiable data for all activities within the CESA, this calculation is a conservative analysis of the potential incremental impact of the Proposed Action. Project-related impacts would be minimized due to implementation of the ACEPMs outlined in Section 2.1.11 and reclamation. Therefore, based on the above analysis and findings, incremental impacts to soils as a result of the Proposed Action, when combined with the impacts from the past and present actions and RFFAs, would be minimal.

#### 4.5.12.2 Powerline Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Watershed CESA is approximately 13,811 acres, which is an impact to approximately eight percent of the CESA. This alternative (approximately 539 acres) would result in an incremental impact of approximately four percent. Impacts to soils from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### 4.5.12.3 On-Site Water Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Watershed CESA is approximately 13,811 acres, which is an impact to approximately eight percent of the CESA. This alternative (approximately 453 acres) would result in an incremental impact of approximately three percent. Impacts to soils from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### 4.5.12.4 Knapp Avenue Access Only Alternative

Under the Knapp Avenue Access Only Alternative, the development and operation of the Project would be similar to the Proposed Action, with the exception of the reduction of one acre of disturbance associated with the construction of the US Highway 95/South Access Road acceleration/deceleration lanes. Therefore, the incremental cumulative impacts under this alternative would be the same as the incremental cumulative impacts under the Proposed Action.

#### 4.5.12.5 No Action Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Watershed CESA is approximately 13,353 acres, which is an impact to approximately eight percent of the CESA. This alternative (approximately five acres) would result in an incremental impact of approximately 0.04 percent. Impacts to soils from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

### **4.5.13 Special Status Species**

The cumulative analysis for special status species has been separated into an analysis for Golden Eagles and all other special status species.

#### 4.5.13.1 Golden Eagles

The CESA for golden eagles is the Golden Eagle CESA. This CESA encompasses approximately 294,509 acres and is shown on Figure 4.2.2.

*Past and Present Actions:* Past and present actions that could have impacted and may be currently impacting golden eagles and their habitat include livestock grazing, wildlife habitat management, dispersed recreation, ROW construction and maintenance, mineral exploration, and mining. These activities have the potential to impact water resources, or result in direct impacts to individuals in travel routes, or loss of forage, cover, and habitat, as well as disturbance of mating and brood rearing practices.

Authorized and closed mineral exploration and mining Notices or plans of operations, as well as mineral material disposal sites, total approximately 852 acres (approximately 0.3 percent of the CESA) of surface disturbance. Approximately 15,636 acres of ROWs were issued within the Golden Eagle CESA that had the potential to create surface disturbance and disturb golden eagles and their habitat and vegetation. The CESA is also comprised of the NDOW Hunt Units 162, 171, 173, 211, 212, and 251, which have the potential to create noise and disturbance to golden eagles, or remove or alter habitat. The Golden Eagle CESA encompasses portions of the following grazing allotments: Monte Cristo; Montezuma; Ralston; San Antone; Sheep Mountain; and Silver King. Livestock grazing and associated management could have contributed to the establishment and spread of noxious weeds, invasive and non-native species, which could have had an indirect effect on golden eagles and their habitat. However, disturbance to golden eagles and their habitat from past and present actions would have been reduced through reclamation and seeding of disturbed areas and natural recolonization of native species. The past and present actions that are quantifiable have disturbed approximately six percent of the CESA. There are no data on the number of acres reclaimed. State and federal regulations require reclamation;

therefore, it is reasonable to assume that some areas have been reclaimed, become naturally stabilized, or have naturally revegetated over time.

*RFFAs:* Potential impacts to golden eagles and their habitat from livestock grazing, dispersed recreation, wildlife habitat management, mining, or loss of native vegetation associated with potential wildland fires could occur. There are no specific data to quantify impacts to golden eagles or their habitat within the CESA as a result of livestock grazing, dispersed recreation, wildlife habitat management, or potential wildland fires. There are approximately 458 acres of pending minerals projects identified in the CESA, which is the proposed Project, and no pending ROW projects. The pending minerals projects are all required to incorporate protection measures for migratory birds, including golden eagles, and therefore, are not expected to directly harm golden eagles, but may result in habitat removal or alteration.

#### *Proposed Action*

The Proposed Action (approximately 364 acres of temporary nesting and/or foraging habitat removal, not including the 75 acres of the open pit that would not be reclaimed) would impact approximately 0.1 percent of the CESA. Quantifiable past and present actions and RFFA disturbance in the Golden Eagle CESA total approximately 16,946 acres, which results in an incremental impact from the Proposed Action of approximately three percent. Since there are limited quantifiable data for all activities in the CESA, this calculation is a conservative analysis of the potential incremental impact of the Proposed Action. Project-related impacts would be localized and minimized due to implementation of the ACEPMs outlined in Section 2.1.11 and reclamation. In addition, the unreclaimed open pit would create additional breeding and nesting habitat for golden eagles. Therefore, based on the above analysis and findings, incremental impacts to migratory birds and their habitat as a result of the Proposed Action, when combined with the impacts from the past and present actions and RFFAs, are expected to be minimal.

#### *Powerline Alternative*

A total of the quantifiable past and present actions and RFFA disturbance within the Golden Eagle CESA is approximately 16,946 acres, which is an impact to approximately six percent of the CESA. This alternative (approximately 539 acres) would result in an incremental impact of approximately three percent. Impacts to golden eagles and their habitat from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### *On-Site Water Alternative*

A total of the quantifiable past and present actions and RFFA disturbance within the Golden Eagle CESA is approximately 16,946 acres, which is an impact to approximately six percent of the CESA. This alternative (approximately 453 acres) would result in an incremental impact of approximately three percent. Impacts to golden eagles and their habitat from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### *Knapp Avenue Access Only Alternative*

Under the Knapp Avenue Access Only Alternative, the development and operation of the Project would be similar to the Proposed Action, with the exception of the reduction of one acre of

disturbance associated with the construction of the US Highway 95/South Access Road acceleration/deceleration lanes. Therefore, the incremental cumulative impacts under this alternative would be the same as the incremental cumulative impacts under the Proposed Action.

#### *No Action Alternative*

A total of the quantifiable past and present actions and RFFA disturbance within the Golden Eagle CESA is approximately 16,488 acres, which is an impact to approximately six percent of the CESA. This alternative (approximately five acres) would result in an incremental impact of approximately 0.03 percent. Impacts to golden eagles and their habitat from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### 4.5.13.2 All Other Special Status Species

The CESA for special status wildlife species is the Recreation/Wildlife CESA. This CESA encompasses approximately 303,699 acres and is shown on Figure 4.2.3.

*Past and Present Actions:* Past and present actions that could have impacted and may be currently impacting special status wildlife species and their habitat include livestock grazing, wildlife habitat management, dispersed recreation, ROW construction and maintenance, mineral exploration, and mining. These activities have the potential to impact water resources and wildlife habitat, or result in direct impacts to individuals in travel routes, or loss of forage, cover, and habitat, as well as disturbance of mating and brood rearing practices.

Authorized and closed mineral exploration and mining Notices or plans of operations, as well as mineral material disposal sites, total approximately 568 acres (approximately 0.2 percent of the CESA) of surface disturbance. Approximately 15,730 acres of ROWs were issued within the Recreation/Wildlife CESA that had the potential to create surface disturbance and disturb special status wildlife species and their habitat and vegetation. The CESA is also comprised of the NDOW Hunt Units 161, 162, 171, 173, 211, 212, and 251, which have the potential to create noise and disturbance to special status wildlife species, or remove or alter habitat. The Recreation/Wildlife CESA encompasses portions of the following grazing allotments: Monte Cristo; Montezuma; Ralston; San Antone; Sheep Mountain; and Silver King. Livestock grazing and associated management could have contributed to the establishment and spread of noxious weeds, invasive and non-native species, which could have had an indirect effect on special status wildlife species and their habitat. However, disturbance to special status wildlife species and their habitat from past and present actions would have been reduced through reclamation and seeding of disturbed areas and natural recolonization of native species. The past and present actions that are quantifiable have disturbed approximately five percent of the CESA. There are no data on the number of acres reclaimed. State and federal regulations require reclamation; therefore, it is reasonable to assume that some areas have been reclaimed, become naturally stabilized, or have naturally revegetated over time.

*RFFAs:* Potential impacts to special status wildlife species and their habitat from livestock grazing, dispersed recreation, wildlife habitat management, ROW construction and maintenance, mineral exploration, mining, or loss of native vegetation associated with potential wildland fires could occur. There are no specific data to quantify impacts to special status wildlife species or their habitat within the CESA as a result of livestock grazing, dispersed recreation, wildlife

habitat management, or potential wildland fires. There are approximately 458 acres of pending minerals projects identified in the CESA, which is the proposed Project, and approximately 15 acres of pending ROW projects identified in the Recreation/Wildlife CESA.

#### *Proposed Action*

The Proposed Action (approximately 384 acres of temporary breeding and/or foraging habitat removal, not including the 75 acres of the open pit that would not be reclaimed) would impact approximately 0.1 percent of the CESA. Quantifiable past and present actions and RFFA disturbance in the Recreation/Wildlife CESA total approximately 16,736 acres, which results in an incremental impact from the Proposed Action of approximately three percent. Since there are limited quantifiable data for all activities in the CESA, this calculation is a conservative analysis of the potential incremental impact of the Proposed Action. Project-related impacts would be localized and minimized due to implementation of the ACEPMs outlined in Section 2.1.11 and reclamation. Therefore, based on the above analysis and findings, incremental impacts to special status wildlife species and their habitat as a result of the Proposed Action, when combined with the impacts from the past and present actions and RFFAs, are expected to be minimal.

#### *Powerline Alternative*

A total of the quantifiable past and present actions and RFFA disturbance within the Recreation/Wildlife CESA is approximately 16,736 acres, which is an impact to approximately six percent of the CESA. This alternative (approximately 539 acres) would result in an incremental impact of approximately three percent, which is the same incremental impact as the Proposed Action, as most of the disturbance associated with the powerline would be located outside the Project Area. Impacts to special status wildlife species and their habitat from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### *On-Site Water Alternative*

A total of the quantifiable past and present actions and RFFA disturbance within the Recreation/Wildlife CESA is approximately 16,736 acres, which is an impact to approximately six percent of the CESA. This alternative (approximately 453 acres) would result in an incremental impact of approximately three percent. Impacts to special status wildlife species and their habitat from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### *Knapp Avenue Access Only Alternative*

Under the Knapp Avenue Access Only Alternative, the development and operation of the Project would be similar to the Proposed Action, with the exception of the reduction of one acre of disturbance associated with the construction of the US Highway 95/South Access Road acceleration/deceleration lanes. Therefore, the incremental cumulative impacts under this alternative would be the same as the incremental cumulative impacts under the Proposed Action.

### *No Action Alternative*

A total of the quantifiable past and present actions and RFFA disturbance within the Recreation/Wildlife CESA is approximately 16,278 acres, which is an impact to approximately five percent of the CESA. This alternative (approximately five acres) would result in an incremental impact of approximately 0.03 percent. Impacts to special status wildlife species and their habitat from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### **4.5.14 Transportation/Traffic**

The CESA for transportation/traffic is the Transportation CESA. This CESA is defined as the roadway network affected by the Project and is shown on Figure 4.2.4.

*Past and Present Actions:* Past and present actions that could have impacted and may be currently impacting transportation/traffic include those actions centered on the movement of people and goods, as well as improvements to the transportation network. Actions involving the movement of goods and people include livestock grazing, minerals development, land development, and general road and highway travel.

*RFFAs:* Increased traffic due to new resource development projects and population increases.

##### 4.5.14.1 Proposed Action

The existing transportation network within and surrounding the Project Area is similar to the existing network throughout the CESA. Most of the incremental cumulative impacts associated with the Proposed Action would be temporary, as in the road claimed by Esmeralda County that would be rerouted around the Project Area, and the fence that would surround the Project Area would be removed at the end of the mine life. The Proposed Action would increase traffic levels on area roadways, as discussed in Section 3.18, and may result in incremental cumulative impacts within the CESA. However, the increased traffic would cease once Project activities end, so would result in a negligible short-term incremental cumulative impact.

##### 4.5.14.2 Powerline Alternative

Under the Powerline Alternative, the transportation network within and surrounding the Project Area would not change; however, there would be a small influx of workers associated with the construction of the powerline which would bring additional traffic into the area. The incremental cumulative impacts under this alternative would be minor and temporary, but similar in nature to the incremental cumulative impacts under the Proposed Action.

##### 4.5.14.3 On-Site Water Alternative

Under the On-Site Water Alternative, the transportation network within and surrounding the Project Area would not change; therefore, the incremental cumulative impacts under this alternative would be similar in nature to the incremental cumulative impacts under the Proposed Action.

#### 4.5.14.4 Knapp Avenue Access Only Alternative

Under the Knapp Avenue Access Only Alternative, the transportation network within and surrounding the Project Area would not change; however, the use of the network under this alternative would be different than the Proposed Action, as outlined in Section 3.18. The incremental cumulative impacts under this alternative would be minor and temporary, but similar in nature to the incremental cumulative impacts under the Proposed Action.

#### 4.5.14.5 No Action Alternative

Under the No Action Alternative, the Three Hills Mine would not be approved and therefore not result in impacts to the existing transportation network within and surrounding the Project Area. There would be a few vehicles traveling on area roadways associated with the Notice-level exploration activities. Therefore, the No Action Alternative's incremental cumulative impact when added to past and present actions and RFFAs, would be minimal.

### **4.5.15 Vegetation**

The CESA for vegetation is the Watershed CESA. This CESA encompasses approximately 165,759 acres and is shown on Figure 4.2.2.

*Past and Present Actions:* Past and present actions that could have impacted and may be currently impacting vegetation include livestock grazing, wildlife habitat management, ROW construction and maintenance, mineral exploration, mining, and dispersed recreation. There are no specific data to quantify impacts to vegetation from livestock grazing, wildlife habitat management, and dispersed recreation.

Authorized and closed mineral exploration and mining Notices and plans of operations, as well as mineral material disposal sites, total approximately 763 acres (approximately 0.5 percent of the CESA) of surface disturbance. Approximately 12,610 acres of ROWs were issued within the Watershed CESA that had the potential to create surface disturbance. The CESA includes NDOW Hunt Units 161, 162, 171, 173, 211, 212, and 251. Impacts caused by hunting activities and associated off-road vehicle travel include the introduction of noxious weeds, invasive or non-native species and trampled vegetation. The past and present actions that are quantifiable have disturbed approximately eight percent of the CESA.

*RFFAs:* Potential impacts to vegetation as a result of livestock grazing, wildlife habitat management, ROW construction and maintenance, mineral exploration, mining, dispersed recreation and potential wildland fire are expected to continue. There are no specific data to quantify impacts to soils as a result of livestock grazing, wildlife habitat management, dispersed recreation, or potential wildland fires. There are approximately 458 acres of pending minerals projects identified in the CESA, which is the proposed Project, and no pending ROW projects identified in the Watershed CESA.

#### 4.5.15.1 Proposed Action

The Proposed Action (approximately 459 acres) would impact approximately 0.3 percent of the CESA. Quantifiable past and present actions and RFFA disturbance in the Watershed CESA is

approximately 13,811 acres, which results in an incremental impact from the Proposed Action of approximately three percent. Since there are limited quantifiable data for all activities within the CESA, this calculation is a conservative analysis of the potential incremental impact of the Proposed Action. Project-related impacts would be minimized due to implementation of the ACEPMs outlined in Section 2.1.11 and reclamation. Therefore, based on the above analysis and findings, incremental impacts to vegetation as a result of the Proposed Action, when combined with the impacts from the past and present actions and RFFAs, would be minimal.

#### 4.5.15.2 Powerline Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Watershed CESA is approximately 13,811 acres, which is an impact to approximately eight percent of the CESA. This alternative (approximately 539 acres) would result in an incremental impact of approximately four percent. Impacts to vegetation from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### 4.5.15.3 On-Site Water Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Watershed CESA is approximately 13,811 acres, which is an impact to approximately eight percent of the CESA. This alternative (approximately 453 acres) would result in an incremental impact of approximately three percent. Impacts to vegetation from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### 4.5.15.4 Knapp Avenue Access Only Alternative

Under the Knapp Avenue Access Only Alternative, the development and operation of the Project would be similar to the Proposed Action, with the exception of the reduction of one acre of disturbance associated with the construction of the US Highway 95/South Access Road acceleration/deceleration lanes. Therefore, the incremental cumulative impacts under this alternative would be the same as the incremental cumulative impacts under the Proposed Action.

#### 4.5.15.5 No Action Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Watershed CESA is approximately 13,353 acres, which is an impact to approximately eight percent of the CESA. This alternative (approximately five acres) would result in an incremental impact of approximately 0.04 percent. Impacts to vegetation from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

### 4.5.16 **Visual Resources**

The CESA for visual resources is the Visual Resources CESA. This CESA is shown on Figure 3.20.1.

*Past and Present Actions:* Past and present actions that may have impacted and may be currently impacting visual resources include ROW construction, mineral exploration, and mining. Impacts

to visual resources include any surface disturbing activity that affects the form, line, color, and texture of the characteristic landscape.

*RFFAs*: Except for the Proposed Action, there are no specifically identified RFFAs that would be occurring within the Visual CESA.

#### 4.5.16.1 Proposed Action

The Proposed Action includes approximately 459 acres of surface disturbing activities, as well as the construction of an open pit, two WRSAs, and buildings and facilities associated with a mining operation. Major activities in the CESA that affect the form, line, color, and texture of the characteristic landscape are roads and highways and the Town of Tonopah. The BLM inventoried the Project Area and vicinity as a VRM Class IV area, which allows for substantial change to the visual characteristics of the area. Project-specific impacts would be minimized by utilizing hooded stationary lights and directing lighting onto the pertinent work site only, and reclamation of mining facilities. The Proposed Action would create a moderate contrast in the form, line, and color between the existing landscape and the post-mining/post-reclamation background landscape. The changes would conform to the area's Class IV designation. Even after reclamation, the disturbed areas associated with the Proposed Action excluding the open pit, as well as past, present and RFFAs, may result in visual contrasts with the existing landscape as the vegetation is reestablishing; however, native vegetation would gradually reestablish within the disturbed areas to minimize visual contrasts.

#### 4.5.16.2 Powerline Alternative

Under the Powerline Alternative, approximately 2.4 miles of 38 new single-pole wood structures between 52 and 70 feet tall would be constructed, along with a wire powerline stretching between the poles. This powerline would be a permanent structure, which would remain after the mining facilities were reclaimed. This alternative would create greater effects to the form, line, and color of the existing landscape; however, the incremental cumulative impacts would be minimal in conjunction with the facilities associated with the Town of Tonopah.

#### 4.5.16.3 On-Site Water Alternative

Under the On-Site Water Alternative, the Project would be constructed and reclaimed in the same manner as the Proposed Action. Therefore, the incremental cumulative impacts under this alternative would be similar to the incremental cumulative impacts associated with the Proposed Action. The changes associated with this alternative would also conform to the area's Class IV designation.

#### 4.5.16.4 Knapp Avenue Access Only Alternative

Under the Knapp Avenue Access Only Alternative, the Project would be constructed and reclaimed in the same manner as the Proposed Action. Therefore, the incremental cumulative impacts under this alternative would be similar to the incremental cumulative impacts associated with the Proposed Action. The changes associated with this alternative would also conform to the area's Class IV designation.

#### 4.5.16.5 No Action Alternative

Under the No Action Alternative, Notice-level exploration activities could continue, which primarily include exploration drilling activities. This alternative would result in up to five acres of surface disturbance. Upon cessation of drilling activities, surface disturbance would be reclaimed and revegetated. Incremental cumulative impacts associated with this alternative to the form, line, and color of the existing landscape would be short term and minimal.

#### **4.5.17 Wastes, Hazardous or Solid**

The CESA for wastes, hazardous or solid is the Project Area. The Project Area encompasses approximately 722 acres and is shown on Figure 1.1.1.

*Past and Present Actions:* Hazardous or solid waste impacts from past actions would not persist, since any uses of hazardous materials would have been limited in scope based on the past uses in the CESA and would likely not carry forward to the present. Hazardous or solid waste impacts from present actions are primarily limited to potential spills from vehicles traveling on paved and unpaved roads.

*RFFAs:* Potential impacts from hazardous or solid wastes as a result of spills from vehicles traveling on paved and unpaved roads could continue. The only identified RFFA in the CESA is the proposed Project.

##### 4.5.17.1 Proposed Action

The Proposed Action would be the principal hazardous materials generating activity in the CESA. Table 2.1-4 lists the regulated petroleum products and hazardous materials that would be used, stored, and transported in association with the Project. As discussed in Section 3.21.2, vehicles traveling on public roads in the Project Area would result in the presence of hazardous materials and wastes; however, impacts would be short term ceasing at the end of the Project life, and would be localized near their sources. Given the low probability of a spill or release, the increase in diesel fuel use or the transportation and use of other hazardous materials are not expected to cause a commensurate increase in cumulative impacts.

##### 4.5.17.2 Powerline Alternative

Under the Powerline Alternative, the Project would be constructed and operated in the same manner as the Proposed Action. Given the low probability of a spill or release, the increase in diesel fuel use or the transportation and use of other hazardous materials are not expected to cause a commensurate increase in cumulative impacts.

##### 4.5.17.3 On-Site Water Alternative

Under the On-Site Water Alternative, the Project would be constructed and operated in the same manner as the Proposed Action. Given the low probability of a spill or release, the increase in diesel fuel use or the transportation and use of other hazardous materials are not expected to cause a commensurate increase in cumulative impacts.

#### 4.5.17.4 Knapp Avenue Access Only Alternative

Under the Knapp Avenue Access Only Alternative, the Project would be constructed and operated in the same manner as the Proposed Action, except all Project traffic (employee vehicles and delivery trucks) would use Knapp Avenue. Given the low probability of a spill or release, the increase in diesel fuel use or the transportation and use of other hazardous materials are not expected to cause a commensurate increase in cumulative impacts.

#### 4.5.17.5 No Action Alternative

Under the No Action Alternative, Notice-level exploration activities could continue. Hazardous substances utilized under the No Action Alternative could include diesel fuel, gasoline, and lubricating grease. Any spills would be cleaned up immediately and reported to the BLM and NDEP. Any resulting waste would be transferred off site in accordance with all applicable local, state, and federal regulations. Any impacts under the No Action Alternative would tend to be localized near their sources, and not result in an incremental cumulative impact.

### **4.5.18 Water Resources**

The CESA for surface water quality is the Watershed CESA. This CESA encompasses approximately 165,759 acres and is shown on Figure 4.2.2.

*Past and Present Actions:* Past and present actions that could have impacted or may be currently impacting surface water quality, wildlife habitat management, ROW construction and maintenance, mineral exploration, mining, and dispersed recreation. There are no specific data to quantify impacts to vegetation from livestock grazing, wildlife habitat management, and dispersed recreation.

Authorized and closed mineral exploration and mining Notices and plans of operations, as well as mineral material disposal sites, total approximately 763 acres (approximately 0.5 percent of the CESA) of surface disturbance. As required by state and federal regulations some of the closed areas have been reclaimed, become naturally stabilized, or have naturally revegetated over time decreasing the amount of sediment that reaches the waterways. Approximately 12,610 acres of ROWs were issued within the Watershed CESA that had the potential to create surface disturbance. The CESA includes NDOW Hunt Units 161, 162, 171, 173, 211, 212, and 251. Impacts caused by hunting activities and associated off-road vehicle travel have the potential to create soil erosion and sedimentation of surface water features. The past and present actions that are quantifiable have disturbed approximately eight percent of the CESA.

*RFFAs:* Potential impacts to vegetation as a result of livestock grazing, wildlife habitat management, ROW construction and maintenance, mineral exploration, mining, dispersed recreation, and potential wildland fire are expected to continue. There are approximately 458 acres of pending minerals projects identified in the CESA, which is the proposed Project, and no pending ROW projects identified in the Watershed CESA. There are no specific data on the amount of sedimentation that could result from these activities. However, mining projects would be required to have spill prevention plans, handle hazardous substances in accordance with NDOT and MSHA, adhere to NAC 534.4369 and 534.4371, and utilize BMPs, thus minimizing impacts to surface water quality.

#### 4.5.18.1 Proposed Action

The Proposed Action (approximately 459 acres) would impact approximately 0.3 percent of the CESA. Quantifiable past and present actions and RFFA disturbance in the Watershed CESA is approximately 13,811 acres, which results in an incremental impact from the Proposed Action of approximately three percent. Since there are limited quantifiable data for all activities within the CESA, this calculation is a conservative analysis of the potential incremental impact of the Proposed Action. Surface disturbance would increase the potential for erosion and sedimentation in the surface water system. Project-related impacts would be minimized due to implementation of the ACEPMs outlined in Section 2.1.11, BMPs, and reclamation. Therefore, based on the above analysis and findings, incremental impacts to surface water quality as a result of the Proposed Action, when combined with the impacts from the past and present actions and RFFAs, would be minimal.

#### 4.5.18.2 Powerline Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Watershed CESA is approximately 13,811 acres, which is an impact to approximately eight percent of the CESA. This alternative (approximately 539 acres) would result in an incremental impact of approximately four percent. Impacts to surface water quality from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### 4.5.18.3 On-Site Water Alternative

Under the On-Site Water Alternative, the development and operation of the Project would be similar to the Proposed Action. Therefore, the incremental cumulative impacts under this alternative would be similar to the incremental cumulative impacts under the Proposed Action.

#### 4.5.18.4 Knapp Avenue Access Only Alternative

Under the Knapp Avenue Access Only Alternative, the development and operation of the Project would be similar to the Proposed Action, with the exception of the reduction of one acre of disturbance associated with the construction of the US Highway 95/South Access Road acceleration/deceleration lanes. Therefore, the incremental cumulative impacts under this alternative would be the same as the incremental cumulative impacts under the Proposed Action.

#### 4.5.18.5 No Action Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Watershed CESA is approximately 13,353 acres, which is an impact to approximately eight percent of the CESA. This alternative (approximately five acres) would result in an incremental impact of approximately 0.04 percent. Impacts to surface water quality from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

### **4.5.19 Wildlife**

The CESA for wildlife is the Recreation/Wildlife CESA. This CESA encompasses approximately 303,699 acres and is shown on Figure 4.2.3.

*Past and Present Actions:* Past and present actions that could have impacted and may be currently impacting wildlife and their habitat include livestock grazing, wildlife habitat management, dispersed recreation, ROW construction and maintenance, mineral exploration, and mining. These activities have the potential to impact water resources and wildlife habitat, or result in direct impacts to individuals in travel routes, or loss of forage, cover, and habitat, as well as disturbance of mating and brood rearing practices.

Authorized and closed mineral exploration and mining Notices or plans of operations, as well as mineral material disposal sites, total approximately 568 acres (approximately 0.2 percent of the CESA) of surface disturbance. Approximately 15,730 acres of ROWs were issued within the Recreation/Wildlife CESA that had the potential to create surface disturbance and disturb wildlife species and their habitat and vegetation. The CESA is also comprised of the NDOW Hunt Units 161, 162, 171, 173, 211, 212, and 251, which have the potential to create noise and disturbance to wildlife, or remove or alter habitat. The Recreation/Wildlife CESA encompasses portions of the following grazing allotments: Monte Cristo; Montezuma; Ralston; San Antone; Sheep Mountain; and Silver King. Livestock grazing and associated management could have contributed to the establishment and spread of noxious weeds, invasive and non-native species, which could have had an indirect effect on wildlife and their habitat. However, disturbance to wildlife and their habitat from past and present actions would have been reduced through reclamation and seeding of disturbed areas and natural recolonization of native species. The past and present actions that are quantifiable have disturbed approximately five percent of the CESA. There are no data on the number of acres reclaimed. State and federal regulations require reclamation; therefore, it is reasonable to assume that some areas have been reclaimed, become naturally stabilized, or have naturally revegetated over time.

*RFFAs:* Potential impacts to wildlife and their habitat from livestock grazing, dispersed recreation, wildlife habitat management, ROW construction and maintenance, mineral exploration, mining, or loss of native vegetation associated with potential wildland fires could occur. There are no specific data to quantify impacts to wildlife or their habitat within the CESA as a result of livestock grazing, dispersed recreation, wildlife habitat management, or potential wildland fires. There are approximately 458 acres of pending minerals projects identified in the CESA, which is the proposed Project, and approximately 15 acres of pending ROW projects identified in the Recreation/Wildlife CESA.

#### 4.5.19.1 Proposed Action

The Proposed Action includes an approximate 480-acre fence boundary, which would restrict access to the majority of wildlife, and would impact approximately 0.2 percent of the CESA. Quantifiable past and present actions and RFFA disturbance in the Recreation/Wildlife CESA total approximately 16,756 acres, which results in an incremental impact from the fenced-in portion of the Proposed Action of approximately three percent. Since there are limited quantifiable data for all activities in the CESA, this calculation is a conservative analysis of the potential incremental impact of the Proposed Action. Project-related impacts would be minimized due to the reclamation of the mining facilities and removal of the fence. Project-related impacts would be localized and minimized due to implementation of the ACEPMs outlined in Section 2.1.11 and reclamation. Therefore, based on the above analysis and findings, incremental impacts to wildlife and their habitat as a result of the Proposed Action, when

combined with the impacts from the past and present actions and RFFAs, are expected to be minimal.

#### 4.5.19.2 Powerline Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Recreation/Wildlife CESA is approximately 16,756 acres, which is an impact to approximately six percent of the CESA. This alternative (approximately 480 acres of a fenced-in area) would result in an incremental impact of approximately three percent, which is the same incremental impact as the Proposed Action, as all disturbance associated with the powerline would be primarily conducted outside the fence boundary. Impacts to wildlife and their habitat from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### 4.5.19.3 On-Site Water Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Recreation/Wildlife CESA is approximately 16,756 acres, which is an impact to approximately six percent of the CESA. This alternative (approximately 480 acres of a fenced-in area) would result in an incremental impact of approximately three percent, which is the same incremental impact as the Proposed Action, since the water line would be buried. Therefore, the presence of the fence would not result in any additional cumulative impacts under this alternative. Impacts to wildlife and their habitat from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

#### 4.5.19.4 Knapp Avenue Access Only Alternative

Under the Knapp Avenue Access Only Alternative, the development and operation of the Project would be similar to the Proposed Action, with the exception of the reduction of one acre of disturbance associated with the construction of the US Highway 95/South Access Road acceleration/deceleration lanes. Therefore, the incremental cumulative impacts under this alternative would be the same as the incremental cumulative impacts under the Proposed Action.

#### 4.5.19.5 No Action Alternative

A total of the quantifiable past and present actions and RFFA disturbance within the Recreation/Wildlife CESA is approximately 16,298 acres, which is an impact to approximately five percent of the CESA. This alternative (approximately five acres) would result in an incremental impact of approximately 0.03 percent. Impacts to wildlife and their habitat from this alternative, in combination with past and present actions and RFFA disturbance, would be minimal.

### **4.6 Mitigation and Residual Effects**

The following section outlines the identified or recommended mitigation measures and associated residual effects for each resource analyzed in this EA.

#### **4.6.1 Air Quality**

No additional monitoring or mitigation measures are recommended, since the air quality analysis indicates that there would be no exceedance of the NAAQS or NSAAQS as a result of the Proposed Action. No vehicular traffic mitigation measures have been identified or recommended for the Proposed Action or any of the alternatives. The residual effects of the Proposed Action include point source and fugitive PM<sub>10</sub>, PM<sub>2.5</sub> and Pb from vehicular traffic, blasting, and material handling and processing operations. Other impacts include combustion emissions of PM<sub>10</sub>, PM<sub>2.5</sub>, CO, NO<sub>2</sub>, and VOC generated by diesel engines and propane. These effects would cease once the Project ceases. There would be no residual impacts to air quality from the proposed Project since reclamation and vegetation would stabilize exposed soil and control fugitive dust emissions. As vegetation becomes established, particulate levels should return to what is typical for a dry desert environment. Once the disturbance ceases and wind erodible surfaces are reclaimed, the resource would return to approximately its pre-mining condition.

#### **4.6.2 Cultural Resources**

An ACEPM for worker environmental training should be implemented prior to surface disturbing activities that includes basic identification and reporting protocols for cultural resources. No other mitigation measures have been identified or recommended for the impacts to cultural resources. The direct residual effect to cultural resources is the removal or burial of ineligible cultural resources by Project activities. There are no indirect related residual effects to significant cultural resources associated with the Proposed Action or alternatives because Project activities would cease once the Project terminates.

#### **4.6.3 Geology and Mineral Resources**

No mitigation measures have been identified or recommended for the impacts to geology and minerals. The residual effect to geology and minerals is the mining of ten Mt of ore and 20 Mt of waste rock and the recovery of the precious metal resource from the ore.

#### **4.6.4 Lands and Realty**

No mitigation measures have been identified or recommended for the impacts to lands and realty. The residual effects to lands and realty would be the 75-acre open pit, which would permanently modify the use of those acres.

#### **4.6.5 Migratory Birds**

No mitigation measures have been identified or recommended for the impacts to migratory birds. The residual effects to migratory birds include the long-term loss of 75 acres of habitat associated with the open pit, as well as the shorter term loss of 459 acres of habitat associated with the Project surface disturbance.

#### **4.6.6 Native American Concerns**

No mitigation measures have been identified or recommended for the impacts to Native American Concerns. In addition, there are no residual effects to Native American Concerns.

#### **4.6.7 Noise**

To minimize the effects of blasting noise and vibration to the residents of the Town of Tonopah, blasting operations would be conducted during daylight hours and at approximately the same time for each blast. No other mitigation measures have been identified or recommended for the impacts to noise. There are no noise-related residual effects associated with the Proposed Action or alternatives because noise would cease once the Project activities terminate.

#### **4.6.8 Noxious Weeds, Invasive and Non-native Species**

No mitigation measures have been identified or recommended for the impacts from noxious weeds, invasive and non-native species. The Proposed Action and the alternatives would result in the unavoidable disturbance of approximately 459 acres of vegetation over the life of the Project, which would produce conditions conducive to supporting noxious weeds.

#### **4.6.9 Public Safety**

The following mitigation would be implemented to minimize blasting flyrock and fumes:

- The correct ANFO mix (94 percent AN, six percent FO) in dry blastholes would be used to avoid the adverse effects of preconditioning (MDA 2014).
- The appropriate priming and bulk explosive loading techniques would be used to control fumes.
- All blastholes would be checked and recorded immediately before loading.
- The nature of any water in the blasthole (i.e. level and recharge rate) would be used to dictate the explosive and loading technique used.
- In areas with no wet holes it is recommended ANFO would be used (MDA 2014).
- The free face should be inspected prior to drilling and all abnormalities observed during drilling such as voids or loss of circulation would be recorded by the drillers and used by the blasters to properly load the blastholes;
- Blastholes would be loaded according to blasthole conditions;
- When blasting to a free face in consistent ground, face burdens of at least 30 charge diameters (17 feet for a 6.75-inch diameter blasthole) would be maintained at all points along the face to properly confine explosive energy;
- The stemming length would be defined based on the charge diameter and blasthole collar conditions;
- Initial stemming lengths would be at least 24 charge diameters (14 feet for a 6.75-inch diameter blasthole) for standard production blast until confinement performance is quantified;
- All blastholes would be measured prior to and after loading (and gassing if that type of product is used);
- Overloaded holes would be remediated by extracting or washing out excessive explosives;
- Angular crushed rock (0.75 to 1.25 inches in diameter) would be used for stemming;
- The blast would be shot the day of loading. This may not always be possible due to wind conditions or production constraints, but it would be set as a performance goal;

- Blast times would be posted in the local newspaper and posted on the community notice board; and
- Appropriate records would be maintained to document the implementation of the mitigation measures.

Residual effects are not anticipated to occur from flyrock as impacts would occur immediately after blasting. Residual effects may occur from the fumes from blasting activities. Implementation of the above mitigation has shown to be effective in similar projects and would minimize impacts from blasting fumes and any potential impacts from flyrock.

Most activities associated with the Proposed Action or the alternatives would not result in residual effects because Project-related activities would cease once the Project terminates. However, the configuration of the open pit with the high walls is a residual effect to public safety. This effect is minimized by the Project design features that create a berm around the open pit.

#### **4.6.10 Rangeland Management**

No mitigation measures have been identified or recommended for the impacts to rangeland management. The Proposed Action and the alternatives (except the No Action Alternative) may result in a residual effect of the permanent loss of approximately one AUM associated with the open pit and a loss of four AUMs over the life of the Project.

#### **4.6.11 Recreation**

No mitigation measures have been identified or recommended for the impacts to recreation. The Proposed Action and the alternatives (except the No Action Alternative) would result in a residual effect of the loss of 75 acres associated with the open pit for the long term of public land managed for multiple use.

#### **4.6.12 Socioeconomics**

No mitigation measures have been identified or recommended for the impacts to socioeconomics. The Proposed Action and the alternatives (except the No Action Alternative) would not result in any residual effects.

#### **4.6.13 Soils**

No mitigation measures have been identified or recommended for the impacts to soils. Implementation of the Proposed Action and the alternatives would result in the unintentional and unavoidable loss of minor amounts of growth media during the salvaging process. In addition, minor degradation in soil stability and productivity may result from the physical processes of stripping, stockpiling, and replacing growth media over the course of the Project. Residual effects to soils would include the permanent loss of soil productivity from approximately 75 acres of soils associated with the open pit.

#### **4.6.14 Special Status Species**

The following mitigation would be implemented to minimize impacts to the loss of bat habitat:

- In order to minimize impacts to bat habitat, bat exclusions would be installed at adits 17 and 18 in the early spring (early April) or late summer/early fall (between September 1 and October 31) after the cessation of maternity activities and prior to the onset of hibernation. WKM would provide funding to NDOW to be utilized as off-site mitigation to protect underground workings through the installation of steel bat gates at the portal of working(s) identified as significant bat habitat within Esmeralda County. Installation of the bat exclusions would be conducted by the NDOW in coordination with the BLM and WKM.

The Project Area is located in close proximity to multiple historic mine workings that may serve as bat roosting and maternity sites; therefore, the removal of adits 17 and 18 is not likely to impact the overall bat population in the area. This mitigation has been utilized in similar projects and has been effective in minimizing impacts to bats and their use of nearby habitat. A residual effect from the removal of the two adits would still occur as a result of the mitigation implementation.

Direct residual effects to special status plant species would not occur as a result of the Project since no special status plant species were located within the Project Area. There is a potential residual indirect effect to potential unoccupied special status plant species habitat in the vicinity of the open pit.

New cliff habitat for raptors would be created by leaving the open pit in place. The habitat provided by the two adits for bats would be permanently lost.

#### **4.6.15 Transportation/Traffic**

No mitigation measures have been identified or recommended for the impacts to transportation/traffic. There are no transportation/traffic-related residual effects associated with Proposed Action or the alternatives because Project-related traffic would cease once the Project activities terminate.

#### **4.6.16 Vegetation**

No mitigation measures have been identified or recommended for the impacts to vegetation. Residual impacts to vegetation would include the permanent loss of vegetative productivity from approximately 75 acres of land associated with the open pit that would not be revegetated.

#### **4.6.17 Visual Resources**

No mitigation measures have been identified or recommended for the impacts to visual resources. The impacts to visual resources by the Proposed Action and alternatives (except the No Action Alternative) would result in unavoidable physical changes in the existing contours and character of the Project Area. The changes would be visibly most apparent over the operational life of the Project; however, the changes would diminish through the completion of

reclamation and revegetation activities. The physical changes to the area would be permanent, but would lessen following the completion of final reclamation as natural processes continue to soften the line, form, and color to match the surrounding landscape.

#### **4.6.18 Wastes, Hazardous and Solid**

No mitigation measures have been identified or recommended for the impacts from wastes, hazardous and solid because of the existing legal framework (and associated requirements) that regulates the transportation, storage, and use of hazardous materials and disposal of solid waste. Residual effects from the use of hazardous materials under the Proposed Action would depend on the substance, quantity, timing, location, and response involved in the event of an accidental spill or release. Operation in accordance with the facilities' Emergency Response Plan and prompt cleanup of potential spills and releases would minimize the potential for residual effects.

#### **4.6.19 Water Quality, Surface and Ground**

Horse Spring, which is located to the west of the Project Area and on private land controlled by others, would not be directly impacted by the Project activities. However, WKM would coordinate with Esmeralda County efforts to improve the spring. No other mitigation measures have been identified or recommended for the impacts to water quality, surface and ground. The Proposed Action and all the alternatives (except the On-Site Water Alternative) have a residual effect to water quality, surface and ground due to the consumption of water over the life of the Project. The On-Site Water Alternative has a residual effect to water quality, surface and ground due to the consumption of water over the life of the Project, as well as the lowering of the water table from the pumping of ground water. This residual effect would diminish over time as the water table recovers from the ground water pumping.

#### **4.6.20 Wildlife**

The following mitigation would be implemented to minimize impacts to big game species:

- The three-strand barbed wire perimeter fence would consist of a smooth bottom wire approximately 18 inches above the ground and a top wire not to exceed 42 inches above the ground.

The residual effects to wildlife include the long-term loss of 75 acres of habitat associated with the open pit, as well as the shorter term loss of 459 acres of habitat associated with the Project surface disturbance, and the exclusion of some wildlife from the 480-acre fenced area. However, it is anticipated that some big game species, particularly pronghorn antelope may try to cross the fence. Implementation of this mitigation would minimize any impacts resulting from the physical harm to the pronghorn antelope or other big game species. Even with this mitigation to reduce this impact, there is a residual effect to wildlife that attempt to pass through the fence.

## 5 CONSULTATION AND PUBLIC INPUT

This EA was prepared at the direction of the BLM, BMD, Mount Lewis Field Office and Tonopah Field Office, by Enviroscientists, Inc., under a contract with WKM. The following is a list of individuals responsible for preparation of this EA.

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Kent Bloomer	Noxious Weeds, Invasive and Non-native Species
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#### Bureau of Land Management, National Operations Center

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**5.2 Persons, Groups and Agencies Contacted**

Federal Agencies

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State Agencies

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Jennifer Hartley, Nevada Department of Transportation

Local Government

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Vance Payne, Nye County Emergency Management Director  
JD Boteler, Esmeralda County Department of Emergency Management Assistant  
Rachel Holt, Esmeralda County Public Works  
Ruth Lee, Esmeralda County Assessor  
Karen Scott, Esmeralda County Auditor/Recorder  
James Eason, Tonopah Town Manager

Native Americans

Timbisha Shoshone Tribe  
Duckwater Shoshone Tribe  
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**APPENDIX A**

**BIRD AND BAT CONSERVATION STRATEGY**

**BIRD AND BAT CONSERVATION STRATEGY**  
**THREE HILLS MINE PROJECT**  
**ESMERALDA COUNTY, NEVADA**

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**BIRD AND BAT CONSERVANCY STRATEGY  
THREE HILLS MINE PROJECT  
ESMERALDA COUNTY, NEVADA**

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## **LIST OF APPENDICES**

Appendix A:	Mortality Report Form
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## LIST OF ACRONYMS

<b>amsl</b>	above mean sea level
<b>ADR</b>	Adsorption-Desorption-Recovery
<b>APLIC</b>	Edison Electric Institute's Avian Power Line Interaction Committee
<b>BBCS</b>	Bird and Bat Conservation Strategy
<b>BGEPA</b>	Bald and Golden Eagle Protection Act
<b>BLM</b>	Bureau of Land Management
<b>BMP</b>	Best Management Practice
<b>BSA</b>	Biological Survey Area
<b>CFR</b>	Code of Federal Regulations
<b>ESA</b>	Endangered Species Act
<b>ET</b>	Evapotranspiration
<b>GBBO</b>	Great Basin Bird Observatory
<b>HCP</b>	Habitat Conservation Plan
<b>JBR</b>	JBR Environmental Consultants, Inc.
<b>MBTA</b>	Migratory Bird Treaty Act
<b>MOU</b>	Memorandum of Understanding
<b>NAC</b>	Nevada Administrative Code
<b>NDOW</b>	Nevada Department of Wildlife
<b>NEPA</b>	National Environmental Policy Act
<b>NRS</b>	Nevada Revised Statutes
<b>ROM</b>	Run-of-Mine
<b>USFWS</b>	United States Fish and Wildlife Service
<b>WKM</b>	WK Mining (USA) Ltd.
<b>WRCC</b>	Western Regional Climate Center

**BIRD AND BAT CONSERVATION STRATEGY  
THREE HILLS MINE PROJECT  
ESMERALDA COUNTY, NEVADA**

**1.0 INTRODUCTION**

**1.1 SCOPE**

A Bird and Bat Conservation Strategy (BBCS) is a project-specific document that describes a program designed to reduce the potential risks of avian and bat mortality that may result from the interaction of these animals with project facilities.

WK Mining (USA) Ltd. (WKM) has submitted a Plan of Operations for the proposed Three Hills Mine Project (Project) in Esmeralda County, Nevada (Figure 1). The Project is currently undergoing a National Environmental Policy Act (NEPA) analysis, which provides a project-specific analysis of the potential impacts to birds and bats resulting from the proposed Project.

This BBCS has been developed based on recommendations from the Avian Protection Plan Guidelines prepared by the Edison Electric Institute's Avian Power Line Interaction Committee (APLIC) and the United States Fish and Wildlife Service (USFWS) in 2012. The Avian Protection Plan Guidelines provide guiding principles to utilize in the development of a BBCS (formerly known as an Avian Protection Plan) and thus reduce avian mortality. The following principles are outlined in the guidelines:

- Corporate Policy
- Training
- Permit Compliance
- Construction Design Standards
- Avian Reporting System
- Mortality Reduction Measures
- Avian Enhancement Options
- Quality Control
- Public Awareness
- Key Resources

**1.2 GOALS OF THE BIRD AND BAT CONSERVATION STRATEGY**

The voluntary implementation of this BBCS will fulfill several goals simultaneously, and fulfillment of each of these goals will contribute to the satisfaction of the ultimate goal of all BBCSs, which is to reduce avian and bat mortality. The goals specific to this BBCS are to:

- Avoid direct impacts to nesting birds during the avian breeding season;
- Identify the environmental and behavioral factors that might lead to areas of high bird or bat use and potentially result in mortality.
- Assist in refining best management practices or protective measures, and protocols to further bird and bat conservation; and
- Ensure the accuracy and detail of incident reporting.

### **1.3 BENEFITS OF A BIRD AND BAT CONSERVATION STRATEGY**

Bird and bat species are perhaps the most obvious groups to benefit when the goals of the BBCS are accomplished. The practical effect of such a plan may also translate to advantages for WKM. As the BBCS reduces bird and bat disturbance or mortality resulting from bird and bat interactions with WKM facilities, costs associated with such interactions could be avoided or held to a minimum. These costs may include monetary losses such as the payment of fines and penalties, repair costs for equipment damaged by bird and bat interaction, or administration and managerial time directed toward alleviating bird and bat conflicts. The BBCS reduces other costs that extend beyond monetary value, such as those attributed to negative public perception.

The voluntary implementation of a BBCS also supports compliance with the state and federal regulations as described in the following section.

### **1.4 FEDERAL AND STATE AVIAN AND BAT PROTECTION LAWS, REGULATIONS, AND POLICY**

#### **1.4.1 Migratory Bird Treaty Act**

The Migratory Bird Treaty Act (MBTA; 16 United States Code 703-712), which is administered by the USFWS, is the cornerstone of migratory bird conservation and protection in the United States. It implements four treaties that provide international protection of migratory birds. The MBTA states that: “it shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill...possess, offer for sale, sell...purchase...ship, export, import...transport or cause to be transported...any migratory bird, any part, nest, or egg of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof.” The word “take” is defined as “to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect.” In 1972, an amendment to the MBTA resulted in bald eagles (*Haliaeetus leucocephalus*) and other birds of prey being included in the definition of a migratory bird. Signed in 2001, Executive Order 13186, 66 Federal Register 3853 directed federal agencies to protect migratory birds. The MBTA currently protects more than 1,000 migratory bird species, including waterfowl, shorebirds, seabirds, wading birds, raptors, and songbirds (USFWS 2008).

### **1.4.2 Bald and Golden Eagle Protection Act**

Under the authority of the Bald and Golden Eagle Protection Act (BGEPA; 16 United States Code 668-668d), bald eagles and golden eagles (*Aquila chrysaetos*) are provided additional legal protection. The BGEPA makes it unlawful to import, export, sell, purchase, barter, or take any bald eagle or golden eagle, their parts, products, nests, or eggs. As used in the BGEPA, “take” includes pursuing, shooting, poisoning, wounding, killing, capturing, trapping, collecting, molesting, or disturbing an eagle.

### **1.4.3 Endangered Species Act**

The Endangered Species Act (ESA; 16 United States Code 1531-1544) is administered by USFWS and the Commerce Department’s National Marine Fisheries Service. The USFWS has primary responsibility for terrestrial and freshwater organisms, while National Marine Fisheries Service has responsibility for marine species. These two agencies work with other agencies to plan or modify federal projects so that they will have minimal impact on listed species and their habitats. Protection of species is also achieved through partnerships with the states, with federal financial assistance and a system of incentives available to encourage state participation.

Section 9 of the ESA makes it unlawful for a person to “take” a listed species. Under the ESA “take” is defined as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct.” Through regulation, the word “harm” has been defined by the Secretary of the Interior as “an act which actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.” However, permits for “incidental take” can be obtained from USFWS for take of endangered species that might occur as a result of an otherwise legal activity.

### **1.4.4 Bureau of Land Management Policy**

The Bureau of Land Management (BLM) has implemented policies for special status species found on BLM-administered lands (BLM Manual 6840). The BLM’s list of special status species includes species that are listed or proposed for listing under the ESA and species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA. The Nevada BLM has adopted State of Nevada protected wildlife as BLM sensitive species. Additionally, all federal candidate species, proposed species, and delisted species (for five years after delisting) will be conserved as BLM sensitive species. In 2010, pursuant to Executive Order 13186, the BLM signed a Memorandum of Understanding (MOU) with the USFWS outlining actions to promote the conservation of migratory birds (BLM MOU WO-230-2010-04).

### **1.4.5 Nevada Regulations**

The State of Nevada through its non-regulatory Natural Heritage Program continually evaluates conservation priorities for over 700 native animals, plants, and vegetation types, focusing on

those that are at greatest risk of extinction or serious decline. Species and habitats of conservation priority are found in the Nevada Wildlife Action Plan (Wildlife Action Plan Team 2012). Laws addressing wildlife are found in Title 45 of the Nevada Revised Statutes (NRS), and supporting regulations are found in chapters 501 through 505 of the Nevada Administrative Codes (NAC). Laws providing for wildlife classification and protections most applicable to this BBBS include NRS's 501.097 - 501.105, NRS 501.181, NRS 502.390, and NRS's 503.584 – 503.620. For example, NRS 503.610 protects bald and golden eagles and NRS 503.620 provides protection of birds included in the MBTA. Classification of wildlife species and related regulations are detailed in Chapter 503 of the NAC and NAC 502.460 – 502.495. The Nevada Department of Wildlife (NDOW) is the principal authority to carry out the State's wildlife programs, laws, and regulations

### **1.5 ENFORCEMENT OF THE MBTA, BGEPA, AND ESA**

The MBTA is a strict liability statute wherein proof of intent is not an element of a violation. Wording is clear in that most actions that result in a “take” or possession (permanent or temporary) of a protected species can be a violation. A violation of the MBTA by an individual can result in a fine of up to \$15,000 and/or imprisonment for up to six months for a misdemeanor, and up to \$250,000 and/or imprisonment for up to two years for a felony. Fines may be doubled for organizations. Penalties increase greatly for offenses involving commercialization or the sale of migratory birds or their parts. Violators of the BGEPA may be fined up to \$100,000 and/or imprisoned for up to one year. The BGEPA has additional provisions where in the case of a second or subsequent conviction of the BGEPA, penalties may be imposed of up to a \$250,000 fine and/or two years imprisonment. Felony violations of the ESA may result in fines up to \$50,000 and/or one year imprisonment (for crimes involving endangered species) and \$25,000 and/or six months imprisonment (for crimes involving threatened species). Misdemeanor violations of the ESA may result in fines up to \$25,000 for endangered species and \$12,000 for threatened species (USFWS 2013).

While the ESA and BGEPA have no provisions for allowing unauthorized take, and while the USFWS generally does not authorize incidental take under these acts, the USFWS recognizes that some birds may be killed even after all reasonable measures to avoid a “take” are implemented. Nonetheless, mechanisms exist for permitting instances where mortality may occur to species regulated by the ESA or BGEPA. Most recently on September 11, 2009, the USFWS published a final rule that established new permit regulations under the BGEPA for incidental take of eagles (74 FR 46836) while conducting otherwise lawful activities. The regulations (50 Code of Federal Regulations [CFR] 22.2) provide for permits to take bald eagles and golden eagles when the taking is associated with, but not the purpose of, an otherwise lawful activity.

Under the ESA, Sections 7 (federal related actions) and 10 (non-federal actions) allow similar permit requirements for incidental occurrences. For ESA Section 7 consultations a biological

opinion issued by the USFWS to the federal action agency is usually the document stipulating take allowances. For non-federal actions, incidental take is permitted under Section 10(a)1(B) only after the project proponent develops a Habitat Conservation Plan (HCP) acceptable to the USFWS in offsetting impacts consequential to the permitted activity and that the proponent demonstrates there is adequate funding dedicated to HCP implementation. Neither BGEPA nor ESA incidental take permits are anticipated as necessary as a result of the Project.

While it is not possible under the MBTA to absolve individuals, companies, or agencies from liability if they follow these recommended guidelines, the USFWS Office of Law Enforcement and the Department of Justice have used enforcement and prosecutorial discretion in the past regarding individuals, companies, or agencies that have made good faith efforts to avoid the “take” of migratory birds. The voluntary implementation of this BBCS is intended to demonstrate proactive measures taken to eliminate impacts to migratory birds at the Project.

## **2.0 PROJECT AREA**

### **2.1 DESCRIPTION OF PROJECT AREA**

The Project is located approximately one mile west of Tonopah, Nevada, in Esmeralda County (Figure 1) in all or portions of Sections 26, 27, 33, and 34, Township 3 North, Range 42 East (T3N, R42E), and Sections 3, 4, 5, 8, 9, and 14 through 16 T2N, R42E, Mount Diablo Base and Meridian (Project Area). The Project Area includes approximately 343 acres of private lands and 379 acres of public land administered by the BLM Battle Mountain District, Tonopah Field Office.

For the purposes of this BBCS, the Project Area was used for analysis; however, baseline surveys described in Section 2.2 were conducted on a slightly larger area.

### **2.2 ENVIRONMENTAL SETTING**

The Project Area is located at the southern end of the San Antonio Mountains with Brougner Mountain and Mount Butler bordering to the east. Elevations within the Project Area range between 5,555 and 6,330 feet above mean sea level (amsl). According to the Western Regional Climate Center (WRCC), the average maximum temperature in Tonopah, located approximately one mile east of the Project Area, is approximately 87 degrees (°) Fahrenheit (F) in July, and the average minimum temperature is approximately 23°F in January. The average annual precipitation is approximately five inches and tends to peak during the month of April (WRCC 2014).

Field surveys confirmed that the initial pre-field analysis identifying nine SWReGAP vegetation communities in the Project Area was not accurate at the project-level. Field surveys confirmed the following three SWReGAP vegetation communities at the project-level: 1) Barren Lands - Mine Tailings (approximately 231 acres); 2) Inter-Mountain Basins Mixed Salt Desert Scrub (approximately 2,889 acres); and 3) Developed, Open Space - Low Intensity (approximately 21 acres) and also remapped the community boundaries (Figure 3). The Barren Lands - Mine Tailings landscape encompasses the Slime Wash within the Biological Survey Area (BSA) as well as landscapes within the northern portion of the Project Area. The surface soils within this landscape are composed primarily of compacted, fine, white silt. The Developed, Open Space - Low Intensity community was composed of developed areas within the Project Area, including the Tonopah cemetery, an apartment complex, a residential neighborhood that extends into the Project Area, an electric substation, and the abandoned buildings within the Lambertucci-Roma Ranch. The remaining majority of the Project Area is composed of the Inter-Mountain Basins Mixed Salt Desert Scrub, and this vegetation community is dominated by shadscale saltbush and bud sagebrush with fluctuations of secondary plant species in localized occurrences within the Project Area.

### **3.0 DESCRIPTION OF THE PROJECT**

#### **3.1 PROPOSED PROJECT COMPONENTS**

WKM proposes to construct, operate, reclaim, and close an open pit, heap leach, and precious metal mining operation. The Project will include the following components:

- One open pit;
- Waste rock storage area(s);
- Run-of-mine (ROM) ore placement;
- A heap leach pad with associated process water tanks and an event pond;
- An Adsorption-Desorption-Recovery (ADR) processing plant;
- A refinery;
- Exploration;
- A lime silo;
- A water supply pipeline, associated water delivery pipelines, and power;
- On-site power generation and distribution system;
- Access and haul roads;
- Ancillary facilities that include the following: haul, secondary, and exploration roads; ready line; maintenance area; storm water diversions; sediment control basins; reagent and fuel storage; storage and laydown yards; explosive magazines; fresh water storage; monitoring wells; meteorological station, an administration/security building; borrow areas; growth media stockpiles; and solid and hazardous waste management facilities to manage wastes; and
- Reclamation and closure, including the development of an evapotranspiration (ET) cell.

WKM proposes to mine between approximately ten and 16 million tons of heap leach ore and between 9.8 and 11.7 million tons of waste rock (for a maximum total of 27.7 million tons of material). The material (both ore and waste) will be extracted from the open pit using conventional open pit mining methods of drilling, blasting, loading, and hauling. WKM will use hydraulic shovels or front end loaders to load the ore and waste into the haul trucks. The haul trucks will transport the waste rock to the waste rock disposal areas near the open pit, and transport the ROM ore to the constructed heap leach pad located on private land. Once placed on the heap leach pad on private land, the ore will be leached with a dilute cyanide solution to dissolve the precious metals into a “pregnant” leach solution. The pregnant solution will then be processed for metal recovery and further off-site refining. Exploration activities, expected to disturb up to ten acres, will occur within the Project Area.

Solid wastes generated by the mine and process departments will be collected in dumpsters near the point of generation. Industrial solid waste will be disposed of in an off-site Class III landfill in accordance with NAC 444.731 through 444.737. A training program will be implemented to inform employees of their responsibilities in proper waste disposal procedures.

Surface water diversion channels and ditches will be constructed as necessary around surface facilities, the open pit, and waste rock storage areas to control storm water run-on to these sites. Surface water control ditches and sediment retention ponds will be constructed in accordance with Best Management Practices (BMPs) as outlined in the Handbook of Best Management Practices (Nevada State Conservation Commission 1994). Sediment ponds and diversion ditches are sized to contain a 100-year, 24-hour precipitation event. Run-on diversion channels and ditches will remain as permanent features after final reclamation and mine closure.

WKM will generate power on site for mining activities. New power line infrastructure will be provided within the Project Area as required for administration and process activities. During construction activities and in areas without electrical infrastructure, temporary mobile generators may be utilized.

## 4.0 SPECIES OF INTEREST

### 4.1 SENSITIVE SPECIES CRITERIA

In this BBCS, the term “sensitive species” encompasses all bird and bat species that are protected by any one of the laws, policies, or regulations described in Section 1.5 of this document. Specifically, this includes:

- All bird and bat species that are listed as threatened or endangered species or are proposed or candidates for listing under the ESA of 1973 as amended.
- All avian species extended protection under the MBTA.
- Bald and golden eagles extended protection under the BGEPA.
- All bird or bat species that the state of Nevada extends protection to through NRS 501.100-503.104, NRS 527.050, and/or NRS 527.60-527.300.
- All species identified as BLM sensitive species in Nevada.

### 4.2 SENSITIVE SPECIES POTENTIALLY OCCURRING WITHIN THE PROJECT BOUNDARY

Enviroscientists, Inc. (Enviroscientists) conducted baseline surveys for wildlife species during the summer of 2014. Twelve species of birds and nine species of bats were identified during the baseline surveys (Enviroscientists 2014) within the Project Area.

Ten of the 12 avian species observed or detected within the Project Area are classified as migratory bird species by the MBTA and include the following species: 1) black-throated sparrow; 2) common raven; 3) lesser goldfinch; 4) great horned owl; 5) horned lark; 6) prairie falcon; 7) red-tailed hawk; 8) rock wren; 9) unidentified swallow; and 10) western kingbird (USFWS 2012). None of the migratory birds observed are classified as BLM sensitive species. Of the ten migratory birds, the following two species are identified as *Conservation Priority Bird Species in Nevada* by the Great Basin Bird Observatory (GBBO): black-throated sparrow, and prairie falcon (GBBO 2004). Chukar and rock dove are not classified as migratory birds.

Raptor surveys were conducted in 2013 (JBR Environmental Consultants, Inc. [JBR] 2013) and 2014 (Enviroscientists 2014). During the 2013 surveys, one occupied red-tailed hawk nest and six golden eagle nests were identified within a one-mile buffer surrounding the Project Area (Figure 3). During the 2014 survey, eight raptor nests were observed within the one-mile buffer (Figure 4). No golden eagles or nests were observed in the Project Area during the baseline surveys.

An aerial golden eagle survey of the Project Area and a ten-mile buffer was performed by JBR in 2013 in order to identify the location of golden eagle nests within these areas. All active golden eagle nests identified during this 2013 aerial golden eagle survey were assessed for their current

status during an additional golden eagle aerial survey performed by Enviroscientists on May 23, 2014. During the 2014 survey, two occupied (GE-12 and GE-13) and two unoccupied (GE-07 and GE-08) golden eagle nests were identified within the one-mile buffer area, and 18 golden eagle nests were observed within the ten mile survey buffer. Of these 18 golden eagle nests, two golden eagle nests were occupied (GE-04 and GE-09), and 16 nests were unoccupied (Figure 5).

No burrowing owls or associated sign (e.g., burrows with pellets, white wash, feathers) were observed within or near the Project Area. Potentially suitable habitat was mapped in the southern portion of the Project Area. However, the habitat requirements for the burrowing owl are somewhat broad, and the presence of potential habitat does not specifically indicate occurrence.

Habitat assessment, acoustic surveys, exit counts, and internal adit surveys were also conducted for bats in 2014 (Enviroscientists 2014). In addition to the 19 abandoned mine workings identified during the pre-field analysis, unmapped abandoned mine workings that were discovered during the wildlife surveys were also recorded and visually assessed.

Twenty-nine mine shafts were identified in the Project Area and within the 0.25-mile buffer. Eight additional mine adits and shafts were located during the wildlife survey within the Project Area and the 0.25-mile buffer. Of these 37 mine shafts and adits shown on Figure 5, twelve of these mine workings were identified to provide suitable bat roosting habitat, and acoustic bat detectors were placed in front of each shaft and adit (Figure 6).

Seven bat species were detected during the acoustic surveys: 1) big brown bat; 2) Brazilian free-tailed bat; 3) little brown bat; 4) California myotis; 5) western pipistrelle; 6) pallid bat; and 7) western small-footed myotis.

Table 1 lists the bird and bat species that have been documented within the project boundary during baseline surveys conducted for the project.

**Table 1: Bird and Bat Species Occurring in the Project Boundary**

Species Name	Sensitive Species
<b>Bat Species</b>	
Pallid Bat <i>Antrozous pallidus</i>	Yes
Big Brown Bat <i>Eptesicus fuscus</i>	Yes
California Myotis <i>Myotis californicus</i>	Yes
Small-Footed Myotis <i>Myotis ciliolabrum</i>	Yes
Little Brown Myotis <i>Myotis lucifugus</i>	Yes
Western Pipistrelle <i>Pipistrellus hesperus</i>	Yes
Brazilian Free-Tailed Bat <i>Tadarida brasilienses</i>	Yes
<b>Bird Species</b>	
Red-Tailed Hawk <i>Buteo jamaicensis</i>	Yes
Black-Throated Sparrow <i>Amphispiza bilineata</i>	Yes
Common Raven <i>Corvus corax</i>	Yes
Lesser Goldfinch <i>Carduelis psaltria</i>	Yes
Great Horned Owl <i>Bubo virginianus</i>	Yes
Western Kingbird <i>Tyrannus verticalis</i>	Yes
Unidentified Swallow Family: Hirundinidae	Yes
Chukar <i>Alectoris chukar</i>	No
Horned Lark <i>Eremophila alpestris</i>	Yes
Rock Dove <i>Columba livia</i>	No
Prairie Falcon <i>Falco mexicanus</i>	Yes
Rock Wren <i>Salpinctes obsoletus</i>	Yes

## **5.0 THREAT ASSESSMENT**

The following are project components that may pose mortality or injury threats to bird and bat species that may use the area.

### **5.1 FACILITY CONSTRUCTION**

Facilities to be constructed include an open pit, a heap leach facility, process ponds, waste rock facilities, electrical transmission lines, and ancillary facilities as described in Section 3. Construction activities may affect birds and bats through direct construction mortality, nest abandonment, or long-term habitat alterations. Each of these is discussed below.

#### **5.1.1 Direct Construction Mortality**

Most adult birds are highly mobile. It is therefore unlikely that grading activities associated with project construction will result in bird injury or death to adults. Eggs or unfledged young birds are not mobile and are thus highly susceptible to direct mortality from construction grading.

#### **5.1.2 Nest and/or Roost Abandonment**

Disturbance from construction activities during the breeding season, including increased noise levels and human presence, could result in abandonment of nests by birds or maternal roosts by bats. Eggs or young in abandoned nests or roosts will die.

### **5.2 OPEN PIT OPERATIONS**

Avian species potentially utilizing the mine's open pits may include raptors and ravens, which may find the pit walls suitable for nesting. The open pits may also provide perching opportunities for raptors and roosting sites for bats. Activity in the open pits will also occur at night and will require the use of artificial lighting. This lighting is likely to attract insects, which may in turn attract foraging bats to the area. Birds or bats attracted to the open pits for nesting, perching, or foraging could be susceptible to injury or death from blasting or contact with equipment.

A potential direct effect of the project operations on golden eagles, migratory birds, and bats is the death or injury resulting from blasting operations associated with pit development. Any avian species in the vicinity of the blasting operations could potentially suffer mortality or injury directly from the blast or from flying debris. The potential for such impact will be alleviated somewhat by the around-the-clock activity at the open pits, which tends to keep wary wildlife away.

The continuous activity in the open pits will likely be sufficient to prevent most or all nesting, perching, and roosting attempts by birds and bats.

### **5.3 FACILITIES USING CYANIDE**

Heap leach mining operations use a cyanide solution to remove gold from ore. Gold-bearing ore is loaded onto heap leach pads, which are constructed on top of impermeable liners. A cyanide

solution is then applied to the heap and allowed to pass through the ore. The cyanide bonds with and leaches the gold from the ore. When the solution reaches the impermeable liner, it follows the liner and flows into collection ditches and then to a collection pond or tank. The gold is then removed from solution by passing the gold-bearing solution over carbon columns.

When cyanide is ingested in migratory birds or bats, hydrocyanic acid can form within the individual and death results within one hour. If less than toxic levels are ingested, the cyanide is rapidly metabolized and excreted without apparent latent toxicity. Cyanide is not known to bioaccumulate in avian or bat species (Henny et al. 1994; O'Shea et al. 2000). However, other potentially toxic materials, such as heavy metals, are also found in cyanide solutions and bioaccumulation of these materials may occur. Any solution in the overflow pond or free-standing water on the heaps could attract bats and various avian species. The Project will utilize tanks for process solution management and thus no open process solution will be accessible to wildlife except in the case of an emergency overflow situation.

### **5.3.1 Heap Leach Facility**

The Project will contain one heap leach pad, an event pond, and process solution tanks. Process solution will infiltrate through the heap, collect in a drainage system at the base of the pad and gravity drain into the pregnant and barren tanks near the outlet of the pad. The solution collection system will include a drainage medium consisting of gravel and/or sand with a network of conveyance pipes. The conveyance pipes will drain to the low point in the pad near the solution tanks and event pond area. After exiting the pad, the conveyance pipes will connect to Palmer-Bowlus flumes where solution can be monitored and measured. Valves located downstream of each flume will be used to direct the solution to either the pregnant or barren solution tank via pipelines.

As described in Section 6.3, daily monitoring of the heap leach pad will occur and should any ponding be found specific measures will be taken. The Project contains no process ponds with solution contained in tanks. Solution channels and piping are designed to minimize open flows of process solution. However, should any open ditches containing solution flows be present netting would be installed.

If no pooling of solution occurs, heap leach pads themselves are not likely to attract either bats or birds to them since they are devoid of vegetation and are unlikely to be associated with concentrations of insects. However, pooled solution can attract birds, bats or other animals as a potential water source. Any dead animals may attract raptors or other carrion-feeding birds.

## **5.4 TRANSMISSION LINES AND POLES**

Transmission lines and poles may be utilized as perching, roosting and nesting habitat for many bird species. Because the transmission lines and poles are well above the tallest vegetation in the

Project Area, birds perched or roosting on these structures have a more open and distant view of their surroundings and are less susceptible to predation. Raptors are opportunistic and may use power poles for a number of purposes, including nest sites, high points from which to defend territories, and perches from which to hunt prey. Hunting from a perched position is energetically efficient for a bird, provided the bird has a view of quality prey habitat.

Bat use of these structures is far more limited than that of birds. They are unlikely to day roost on exposed power poles and communication towers. The Project Area will contain power distribution lines and poles from the on-site generators.

Direct threats to birds and bats resulting from project operation of the transmission line may include injury or mortality from transmission line collisions and/or electrocutions. Indirect effects include increased predation on other species by raptors or corvids utilizing the power lines as perches. These potential threats are discussed separately in following sections.

#### **5.4.1 Electrocution**

Avian electrocutions can occur when a bird completes an electric circuit by simultaneously touching two energized parts or an energized part and a grounded part of the electrical system. The potential for electrocution for any particular bird species is dependent on environmental and engineering factors (APLIC 2006). Environmental factors include behavioral and biological characteristics unique to individual avian species, which determine in part how that species will utilize power poles. Behavioral and biological characteristics include the physical size and shape, foraging characteristics, flight pattern, and territorial traits of the species. Environmental factors also include the natural topography of the area, vegetation in the area, available forage and prey in the area, and weather.

Eagles are the most commonly reported electrocuted avian species, with golden eagles reported to suffer electrocution 2.3 times more frequently than bald eagles (Manville 2005). This is likely due to both their large size (larger birds with greater wingspans are much more susceptible to electrocution because larger wingspans can increase the potential for two points of simultaneous contact) and to their propensity for using power poles both for nesting and foraging. Bats, on the other hand, due to their small size and lack of attraction to power lines, are far less likely to be electrocuted.

Engineering factors include the physical design and construction of the electrical system, including the transmission lines, power poles, transformers, and other components of the system. A bird may potentially come into simultaneous contact with two energized conductors or an energized conductor and grounded hardware if the spacing between any of these two components is inadequate. If such contact occurs, an electric circuit will be completed and electrocution will result (APLIC 2006).

Nests on power transmission structures that pose the greatest risk to birds are those that are built in close proximity to energized conductors and hardware. While a nest that is not in close proximity to energized parts may not be an electrocution risk in and of itself, parent birds and possibly nest predator birds tend to routinely land on other parts of the power pole or surrounding poles that may be unsafe (APLIC 2006). In the project area, the species most likely to nest on power poles are ravens and raptors.

#### **5.4.2 Collision**

Avian species have been documented colliding with transmission lines and a number of factors contribute to this risk. APLIC (2012) outlines collision risk factors for avian species, these include:

- Exposure to collisions is largely a function of behavior. Specific behaviors (such as flushing, courtship displays, and aerial hunting) may distract birds from the presence of power lines.
- Exposure is increased for birds that make regular and repeated flights between nesting, feeding, and roosting areas in proximity to power lines.
- Susceptibility to collisions is partially a function of wing and body size and vision. Larger, heavy-bodied birds with short wing spans and poorer vision are more susceptible to collisions than smaller, lighter-weight birds with relatively large wing spans, agility, and good vision.
- Environmental conditions (such as inclement weather and darkness) may distract birds from the presence of power lines or obscure their visibility.
- Engineering aspects, including design and placement, can increase or decrease the exposure for collisions.

The risks to birds relate to a species characteristics including birds' body size, weight, wing shape, flight behavior, and nesting habits. In general, birds of prey are good fliers, have the ability to avoid obstacles, and are not prone to collisions; however, when they are engaged in certain activities (e.g., territorial defense or pursuing prey) their collision risk increases (Harness et al. 2003; Olendorff and Lehman 1986 as cited by APLIC 2012).

These same risk factors could apply to bat species. Bats are most active in low light and dark hours. While bats typically navigate and forage by emitting and receiving high-frequency sound (echo-location), bats not actively echo-locating may fail to detect the transmission lines or poles when in flight. While the current literature only addresses collision risk with wind energy facilities, the risk to bats posed by power facilities or communication towers is likely low.

Birds may collide with transmission lines because the lines or associated static lines (used to ground the system) are not readily visible under poor visibility conditions. Smaller birds such as passerines are generally much more agile and may be better at avoiding transmission lines.

Features are static and generally not sited where large concentrations of foraging or migrating birds or bats are expected.

### **5.5 ANCILLARY FACILITIES**

The Project will include numerous ancillary facilities within the Project Area. These facilities include:

- Reagent, fuel, and explosives storage
- Buildings and associated parking
- Septic system
- Monitoring wells
- Meteorological station
- Storm water diversions and sediment basins
- Solid and hazardous waste management facilities
- Borrow areas
- Growth medium stockpiles
- Fencing
- Yards and inter-facility disturbance

These facilities could provide suitable nesting substrate for small- to medium-sized avian species that occur in the project area.

The potential for avian and bat species to collide with the various support buildings is low but will be present when avian species are in flight during adverse environmental conditions, such as rain, fog, strong winds, or other similar periods of low visibility. Avian and bat species are also subject to collision with the facilities when flying while distracted. Potential distractions could include foraging, territorial chases, escape from predators, nearby human activity, or other such action that results in aggressive and swift flight, or erratic and fear-driven flight.

The majority of the facilities are not tall features, are static, and not generally sited where large concentration of birds and bats are known or expected.

### **5.6 ROADS AND TRAFFIC**

Traffic on access roads may result in avian mortality due to vehicle-wildlife collisions. Wildlife, including birds and bats, may be struck by vehicles while attempting to cross roads. The presence of road-killed wildlife may in turn attract scavengers including species such as common

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ravens, and raptors. These species will then be at risk of also being struck by vehicles. Impacts on wildlife are less likely along mine roads since there is less available habitat for wildlife within the mine.

Speed limits are required within mine facilities and do not generally exceed 25 miles per hour. Most birds are able to evade a collision at lower speed limits.

### **5.7 HUMAN PRESENCE AND DISTURBANCE**

In addition to the direct impacts on bird and bat habitat from land clearing and construction activities, the presence of humans and the variety of other mine-related disturbance (e.g., noise, lighting, dust, and vibration) in the Project Area may influence some bird and bat species to avoid areas of activity. Some species may seek suitable habitat at a greater distance from human activity, potentially resulting in increased competition with congeners already occupying those habitats. Activities that disturb birds during the nesting season may influence some birds to abandon nesting attempts, a consequence that could be considered a take under the MBTA and the BGEPA.

Increased noise levels have been shown to adversely affect golden eagles and other avian species. However, golden eagle behavior varies among individuals and can be affected by previous experiences. General reactions of golden eagles to noise and disturbance include (Pagel et al. 2010):

- Agitated behavior (displacement, avoidance, and defense)
- Increased vigilance at nest sites
- Change in forage and feeding behavior
- Nest site abandonment

## **6.0 BIRDS AND BAT PROTECTION MEASURES**

In order to protect bird and bat species, WKM will employ a number of protection measures at the Project. These measures will be in place throughout the life of the mine.

### **6.1 PERMIT AND REGULATORY COMPLIANCE**

WKM will ensure compliance with regulatory directions (e.g., permits and environmental documents) for protection of birds and bats as described below.

#### **6.1.1 Nevada Division of Wildlife Industrial Artificial Pond Permit**

An Industrial Artificial Pond Permit for the process pond associated with leaching operations will be obtained for the life of the mine. Several actions associated with the permit reduce threats to birds and bats from operations where cyanide is present. Cyanide-containing ponds, ditches and other cyanide-containing systems that may contain solution that could be toxic to wildlife and domestic animals are fenced to minimize the potential for wildlife mortality due to chemical exposure. Smaller ponds are covered with netting or bird balls to prevent access by birds and bats.

As part of the Industrial Artificial Pond, monitoring and reporting of wildlife mortality associated with permitted pond solutions or structures and mortality not associated with permitted pond solutions will occur quarterly to the NDOW.

#### **6.1.2 Additional Permits**

Additional federal and state permits might be required for activities that could affect bird and bat species protected by the MBTA, BGEPA, ESA, or Nevada state laws. In special circumstances, described below, additional permits may be required to reduce threats to birds and bats.

For bird species protected by the MBTA, WKM might possibly need a Migratory Bird Special Purpose Utility Permit for nest removal or nest relocation. For information on this permit, WKM will contact the Region 8 USFWS Migratory Bird office. An application must be submitted in writing on a Federal Fish and Wildlife License/Permit Application (Form 3-200) or as otherwise specifically directed by the USFWS.

WKM would not need a migratory bird permit to transport a sick, injured, or orphaned migratory bird to a permitted rehabilitator (see Section 8, Key Resources).

For species protected by the ESA, WKM will contact the Reno Ecological Services field office for information and guidance on whether an Incidental Take Permit is required. Currently, no federally threatened or endangered species occur in or near the Project Area.

#### **6.1.3 Nesting Birds - Migratory Bird Treaty Act**

To comply with the MBTA and to avoid destruction of migratory bird nests, WKM will perform land-clearing activities such as vegetation removal outside of the bird-nesting season (March 1 to

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August 1). If land-clearing activities occur during the bird-breeding season, clearance surveys will be performed in accordance with the BLM Statewide Wildlife Survey Protocols. The surveys will occur in the area of proposed disturbance including a 300 foot buffer unless the BLM or USFWS recommends a different distance. Surveys will be conducted a maximum of two weeks prior to disturbance and are then adequate for a maximum of two weeks. Additional surveys will need to be repeated after two weeks have elapsed if proposed activities have not been initiated. If active nests are found, proposed activities will not occur until after young have fledged, nests are abandoned, or after the nesting season ends unless a 300 foot buffer can be provided around nests.

Annual monitoring of raptor nesting sites will occur throughout the life of the Project, and will continue at least one year after the Project is complete. Monitoring will be performed in accordance with the 2014 BLM Nevada Wildlife Survey Protocols or other current BLM protocols at the time. This monitoring will occur in late April to May to determine if nest occupancy has occurred. A follow-up survey will be performed in early to mid July to document nesting success in those nests where occupancy was observed.

The monitoring will include the following 2013 and 2014 raptor nest sites:

- GE 1, 2, 4, 5, 7, 8, 11, 12, 13;
- PR 9, 10, 16, 17, 18;
- RH 3, 4; and
- Unk 1, 2.

#### **6.1.4 Bat Exclusions**

All of the open shafts and adits within the Project Area where acoustic bat surveys were performed should also be considered as potential roosting habitat for bats. If necessary, the implementation of bat exclusions and portal closures should occur during late summer, or early fall after cessation of maternity activities and prior to the onset of hibernation. This time frame is approximately from September 1 to October 31. Immediately following final confirmation of bat exclusion, permanent closure of mine openings should be implemented.

Potential mitigation for any loss of bat habitat described in the baseline report (Enviroscientists 2014) could include securing the Rex Shaft (identification number 9: Figure 6) by removing the creosote-covered wood power poles that cap the shaft's opening. These poles present a potential fire hazard that if burned could result in the loss of bat roost habitat in the Rex Shaft. Installation of a bat grate or cupola over the Rex Shaft opening would serve in securing it from a public safety standpoint while continuing to allow bat utilization. The BLM will establish any necessary mitigation measures through the NEPA process and WKM will help to close appropriate mine working as stipulated by and in coordination with the BLM.

## **6.2 DESIGN OF PROJECT COMPONENTS**

### **6.2.1 Power Lines and Poles**

All utility lines at the Project will meet the APLIC standards to minimize the potential for avian electrocution.

Most transmission line poles will be typical monopole structures constructed of a single wooden pole set upright into the ground without a continuous foundation. The transmission line will consist of three conductors as well as a single static line at the top. The distance between the three conductors will be a minimum of five feet on the tangent structures.

The use of wood reduces the potential for electrocution because wood is a poor conductor of electricity and there are fewer potential circuits present than when metal poles are used. Additionally, the power poles will be constructed in accordance with the raptor-safe design criteria recommended by the APLIC (2006). The APLIC recommends at least five feet of clearance between phases and any electrical ground. Each phase of the three-phase transmission line at the Project will be spaced approximately five to seven feet from each other, depending on the power pole structure. Within the Project Area, there are a variety of electrical transmission and distribution lines with varying voltages. Examples of compliant construction of electrical systems are exhibited in Appendix C of the APLIC Guidance on Power Line Construction. Implementing these designs will prevent birds, including golden eagles (which are expected to be the largest bird in the area), from completing an electrical circuit and suffering electrocution through utilization of the transmission lines.

### **6.2.2 Ancillary Facilities**

The majority of the facilities to be constructed at the Project will be low to the ground and not likely to exceed a height of two stories. Additionally, these facilities will not be designed with numerous windows, limiting the potential for avian collisions under good visibility conditions. Given the design of these facilities, avian collisions will likely involve individuals flying low (landing or taking off) or while distracted (escaping a predator).

Mining activities are expected to occur 24-hours a day; therefore, some lighting will be used at night. Avian species that forage in flight (e.g., swallows, swifts, and nighthawks) have been observed feeding on swarms of flying insects attracted to continuously burning artificial light sources at dusk, dawn, or at night (Lebbin et al. 2007). Some bat species could be anticipated to feed on swarms of insects attracted to artificial light sources as well, considering flying insects are the primary forage item for many bats. If collisions or other issues arise associated with lighting, WKM will consider equipping plant facility lights with shielding to prevent or reduce bat attraction to any swarming insects and motion detectors or power switches so that continuous illumination is avoided, except where continuous illumination is necessary for safe operations.

This will prevent swarms of insects from forming near structures equipped with lights that are not on continuously, and thus reduce potential for avian and bat collisions.

### **6.3 OPERATIONAL MEASURES**

#### **6.3.1 Heap Leach Pads**

Areas that are being actively leached on the heap leach pad will be inspected on a daily basis. If any ponding is found on the surface, the cause will be determined and measures taken to eliminate the solution accumulation. Measures can include solution delivery system repair, adjustment of solution application rates, and ripping of the heap leach pad surface.

#### **6.4 TRAINING AND QUALITY CONTROL**

WKM will conduct annual employee training and contractor training on an as-needed basis that includes a section on the individual's responsibility when dealing with wildlife issues, including injured and dead birds and bats. The instruction will include information on how individuals need to implement the protocols described in this BBCS, such as accurately filling out the Wildlife Incidence Forms. The training will also include the reasons, needs, and methods for reporting bird and bat injuries and mortalities, how to implement nest management protocols, the disposition of carcasses, the importance of complying with applicable regulations, and the potential consequences of non-compliance.

In addition to the annual training, supplemental training might be necessary if there are changes in regulations, permit conditions, protection materials and technologies, or internal policies. Training should be prioritized for highest risk areas as follows:

- Heap leach pad personnel
- Haul or transport personnel (road collisions)

Because identification of a bird that is injured or killed is useful information, the Environmental Department could consider having a bird book available to help employees and contractors identify species. The department could also provide a book with pictures of bats that could occur in the Project Area.

#### **6.5 ASSESSMENT OF THREATS FOLLOWING IMPLEMENTATION OF AVOIDANCE AND MINIMIZATION MEASURES**

Potential threats to birds and bats from the construction and operation of the mine are addressed by a number of measures that have been described in this section. With the implementation of these measures, the overall potential threat to birds and bats will be low for most areas of the mine operation, including the following:

- Poisoning from process solution facilities, including the overflow pond and heap leach pad, minimized through design, maintenance, and operation features.
- Electrocutation from power lines and power poles minimized through implementation of APLIC design features.
- Collision with power lines and power poles minimized through implementation of APLIC design features.
- Collision with ancillary facilities minimized through design.
- Collision with vehicles minimized through vehicle speed limits.

## 7.0 IMPLEMENTATION AND ADAPTIVE MANAGEMENT ACTIONS

Design and operations of the mine have been tailored to minimize potential threats to birds and bats. However, protecting birds and bats through the life of the Project will require that the efficacy of these measures is evaluated over time. Furthermore, changes to project infrastructure or operations may be required if moderate or high threats to birds and bats are discovered due to unforeseen circumstances. Adaptive management can be used to meet these needs.

In the context of this BBCS, adaptive management is defined as a systematic approach for improving resource management by learning from management outcomes (Williams et al. 2009). In this case, the management is the suite of bird and bat threat reduction measures. Learning from the implementation of these measures and applying that knowledge to ensure minimization of threats requires three basic components:

- Post-implementation monitoring
- Assessment of monitoring data
- A process for adapting management based on the results of assessment

Strategies for these three components collectively form an adaptive management plan. The adaptive management plan discussed in the following sections will allow WKM to document and ensure that conservation efforts for birds and bats are effective.

### 7.1 MONITORING

To effectively inform adaptive management, the monitoring information must be sufficient to evaluate if threat avoidance and minimization measures, including ongoing operational measures, are implemented, and whether these measures are effective at managing threats to birds and bats. Therefore, there are two categories of monitoring that can be considered:

- **Implementation Monitoring:** Documents that implement measures designed to minimize threats to birds and bats are implemented (e.g., permit compliance, design, and operations)
- **Efficacy Monitoring:** Evaluates the efficacy of threat minimization measures by documenting bird and bat mortality and injury

#### 7.1.1 Implementation Monitoring

This monitoring will document the implementation of all measures intended to reduce threats to birds and bats described in Section 5. Monitoring frequency and methods will vary by protection measure but will be sufficient to evaluate the following:

- Establish a system to document that training occurs (e.g., sign-in sheet)
- Implementation of design threat reduction measures (e.g., APLIC measures and overflow and contingency pond protection measures)

- Response to bird and bat mortalities
- Mortality reporting procedures and responses
- Completeness of Wildlife Incidence Report forms to make sure they are being properly filled out
- Success of reclamation efforts

### **7.1.2 Efficacy Monitoring**

The primary objective of this monitoring is to evaluate the efficacy of threat reduction measures through documentation of mortality or injury to birds and bats. Documenting bird and bat mortalities will be a standard practice for the duration of the project. All appropriate personnel will be provided with instruction on implementing the methodology described below to report bird and bat injury and mortality.

Mortality will be reported on a standardized Mortality Report Form (an example is provided in Appendix A). This form will be provided to all WKM employees and contractors, or the forms will be readily available from supervisors and/or the Environmental Department. Instructions on how to record and report bird and bat injury and/or mortality will be provided during the annual WKM employee training or during contractor site training.

Detection of dead or injured birds and/or bats will be through incidental observations and routine scheduled monitoring practices. Such practices include daily checks of cyanide solution application areas on the heap leach pad to ensure that no ponding is occurring prior to infiltration, checks on the condition of any wildlife exclusion features, and to search for wildlife presence and mortality. In addition, employees and contractors will be requested to be alert to injured or dead wildlife in their work areas.

If an injured or dead bird or bat is found, the following information will be recorded:

- Date and time bird or bat is found
- Location of injured or dead animal
- Known or possible cause of injury or mortality
- If possible, the species or a description of the bird and bat (e.g., size, color)
- If possible, photographs of the bird or bat

The completed form will be provided to the employee's supervisor or to the Environmental Department within 24 hours.

#### ***7.1.2.1 Monitoring of Facilities Where Cyanide May Occur***

Monitoring for dead or injured birds and bats will occur at these facilities concurrent with operational procedures.

### ***7.1.2.2 Monitoring of Power Lines and Power Poles***

WKM will perform a site assessment in response to any power outage to determine the cause and circumstances of the outage. If the power outage is due to bird interaction with the on-site generation system, WKM will record the relevant information on a Wildlife Incidence Report Form. The information will include the species of bird, the nearest power pole number, the cause of death (if it can be determined), and other pertinent information such as condition of the carcass. Photographs of the carcass will be included with the Wildlife Incidence Report Form to help identify the affected species and potentially, the contact area of electrocution (e.g., wing, feet).

Monitoring of power lines and power poles will occur incidental to general mine operations.

### ***7.1.2.3 Monitoring of Ancillary Facilities***

Monitoring of ancillary facilities will occur incidental to general mine operations.

### ***7.1.2.4 Monitoring of Vehicle Traffic***

WKM will collect data on where the injury or mortality occurs on the roads and the affected species.

## **7.2 ANALYSIS AND ASSESSMENT**

The primary objective of this BBCS is to assure that risk of injury or death to birds and bats remains low, as defined in Section 5. Assessment of mortality data will focus on a description and summary of risk during project development and operations based on monitoring data.

### **7.2.1 Implementation of Risk Avoidance and Minimization Measures**

Staff with the Environmental Department will review and compile information documenting implementation of risk reduction and avoidance measures. This will include regular reviews to assure that design measures are functioning as intended and operational measures are implemented, including regular staff training.

### **7.2.2 Efficacy of Threat Minimization Measures**

WKM will compile data on bird and bat injuries and mortalities reported on Wildlife Incident Report Forms into the NDOW Quarterly Wildlife Mortality Report Form. The quarterly report will be submitted to NDOW as required by WKM's Industrial Artificial Pond Permit. If requested, WKM will make these quarterly report forms available to other regulatory agencies.

During these quarterly reporting periods, a designated employee in the Environmental Department will review all Wildlife Incident Report Forms to look for patterns of injury or mortality that indicate the risk to birds and bats is higher than low. The specific standards for identifying a higher than low risk are:

- Regular incidence of mortality
- Multiple mortalities in a single incident
- Involvement of special status species

If any of these conditions occur, a review of the incident will be initiated.

### **7.3 ADAPTIVE MANAGEMENT**

The adaptive management approach in this BBCS relies on meeting the management goal of minimizing bird and bat injuries and mortalities through integration of design, management, and monitoring. This BBCS identifies the project component threats to birds and bats and the actions necessary to minimize or mitigate those threats. Evaluation of the monitoring results provides feedback on the effectiveness of the measures. Adaptive management includes learning from and responding to the monitoring results to update planning, policies, and management actions.

#### **7.3.1 Regular Reviews of Monitoring and Assessment**

At regular intervals (quarterly, annually), collected monitoring data and assessment will be reviewed by the Environmental Department. The objectives of these reviews will be to identify opportunities to improve physical or operational risk avoidance and minimization measures. Factors evaluated could also include input from personnel, availability of new technologies, and new protocols for data collection and monitoring. Agencies and pertinent stakeholders will be contacted to review any potential changes to the measures in this BBCS prior to implementing them.

As part of the regular review process, agency feedback and opinions on system reliability, and bird and bat protection will be solicited.

#### **7.3.2 Mortality Incident Review**

If monitoring data indicates that threats to bats or birds exceed the low risk level, a review of the incident will be initiated. WKM will perform an investigation of the affected site to collect more information on the potential cause of the incident(s). This may include more detailed site data, climatological information, or local information on bird and bat behaviors (e.g., migration and breeding congregation) that may be pertinent to the incident.

For cyanide-related incidents, these reviews will be conducted according to permit requirements, including contacts with the appropriate agency. For other types of incidents, WKM will contact agencies and pertinent stakeholders to review the incident. Depending on the type of incident and severity, a technical working group may be convened including agency and public stakeholders.

During these reviews, WKM will determine whether a remedial action to improve or correct a situation is necessary. The need for remedial action will depend on the frequency of incidents at

a particular location or facility (e.g., increased number of incidents from the highest annual baseline recorded at the site or locations with multiple injuries or mortalities), the species affected, and the potential effectiveness of a remedial action. Likewise, these same factors will determine what types of remedial protection measures and practices WKM will implement and if such measures are necessary (e.g., perch protectors or portable propane cannons).

The outcomes of these reviews will be determined with the collaboration of agency stakeholders. Possible responses may include modifications to facilities, operational measures, or additional monitoring. All decisions made during the mortality incident review process will be documented.

## 8.0 COLLABORATION

### 8.1 PUBLIC AWARENESS

A public awareness program can be an integral part of a BBCS and can be used to enhance public awareness and support for WKM’s voluntary implementation of this BBCS. Public participation allows stakeholders such as government agencies, tribes, non-profit organizations, wildlife rehabilitators, and other interested parties an opportunity to provide input to the decision-making process, enabling all parties to work openly and collaboratively towards recommendations that can be effectively implemented (Edison Electric Institute and APLIC 2012). The relationships developed through this process may also encourage the public to report bird and bat mortalities and encourage them to seek assistance for birds that have been injured in power line-related accidents (APLIC 2012).

### 8.2 KEY RESOURCES

The following key resources (Table 2) can provide WKM with expertise in permitting, information on bird and bat populations and behavior, and the latest designs and products to protect birds and bats.

**Table 2: Key Resources**

Organization	Office or Location	Address or Individual	City, State	Phone	E-mail
USFWS	Migratory Bird Permit Office	2800 Cottage Way	Sacramento, CA 95825	916-414-6464	<i>permitsR8M B@fws.gov</i>
USFWS	Field Office, including law enforcement	1340 Financial Blvd., Suite 234	Reno, NV 89502	775-861-6300	
NDOW	Main Office, Nevada Bat Working Group	Jenni Jeffers	Fallon, NV	775-423-3171 x234	ndowinfo@ndow.org
NDOW	Las Vegas Office, Wildlife Mortality Reporting	4747 Vegas Drive	Las Vegas, NV 89108	702-486-5127 x3612	
NDOW	Injured Bat Care	Jenni Jeffers	Fallon, NV	775-423-3171 x234	
BLM	Battle Mountain District, Tonopah Field Office	1553 South Main Street	Tonopah, NV	775-482-7800	
Nevada Natural Heritage Program		901 South Carson St.	Carson City, NV 89701	775-684-2900	
Great Basin Bird Observatory		1775 E. Plumb Lane, #256A	Reno, NV 89502	775-323-4226	

<b>Organization</b>	<b>Office or Location</b>	<b>Address or Individual</b>	<b>City, State</b>	<b>Phone</b>	<b>E-mail</b>
Western Bat Working Group					<a href="http://www.wbwg.org/aboutus/contactus.html">http://www.wbwg.org/aboutus/contactus.html</a>
Federal and State Permitted Wildlife Rehabilitators	Nancy Laird		Washoe Valley, NV	775-849-0345	
Federal and State Permitted Wildlife Rehabilitators	Evelyn Pickles		Dayton, Nevada	775- 883-8658	
Federal and State Permitted Wildlife Rehabilitators	Wild Wing Project	Lisa Ross	Las Vegas, NV	702-238-0570	

Additional key resources that may be contacted include company specialists, consultants, university faculty, other biologists, wildlife rehabilitators, industry consultants, and other mining operations with effective bird and bat protection programs.

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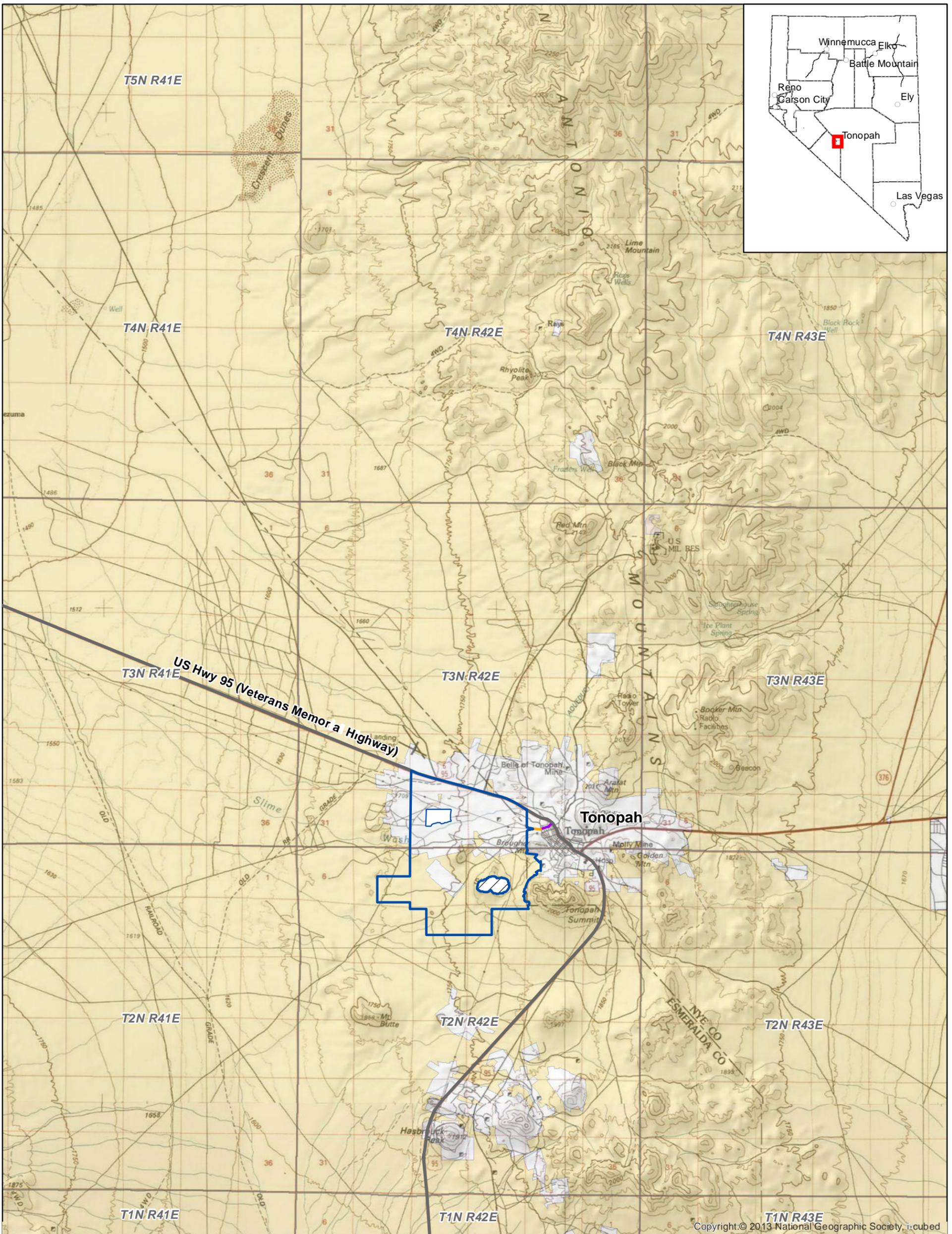
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## FIGURES

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**Explanation**

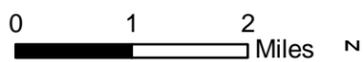
- Biological Survey Area
- Excluded Area
- Access Road (Knapp Ave.)
- Access Road (Ohio Ave.)
- Land Status**
- Bureau of Land Management
- Department of Defense
- Forest Service
- Private

**WEST KIRKLAND MINING INC.**

**THREE HILLS MINE PROJECT**

**Project Location, Access,  
and Land Status**

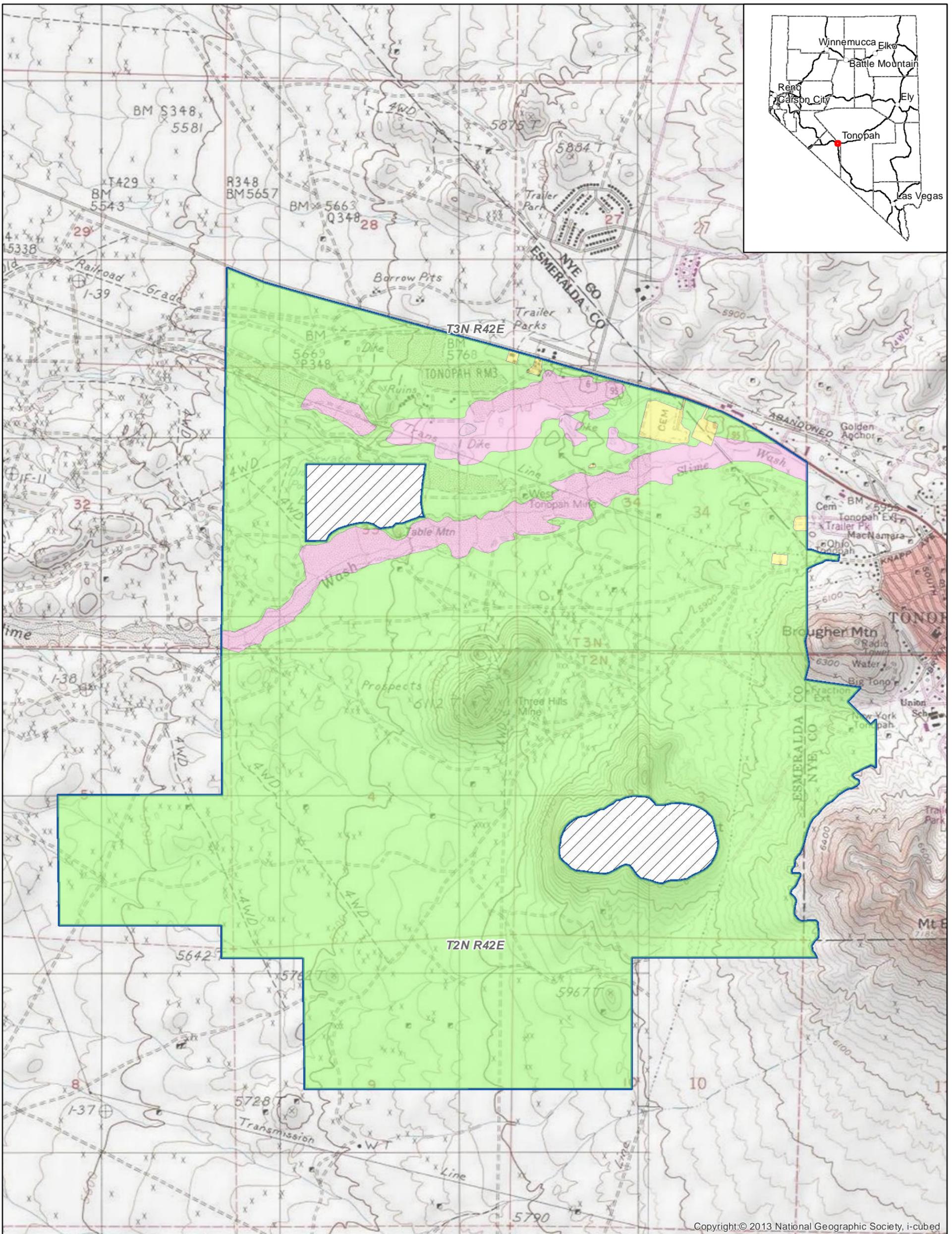
Figure 1



Date: 09/16/2014	Drawn By: GSL/SCH
Revised:	Project No.: 3288
Base Map: USGS 7.5' quads: Tonopah, Mount Butte	
File Name: 3288XH_ThreeHillsMine_FIG1_Loc.mxd	



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**Explanation**

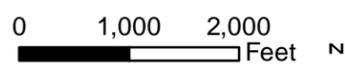
- Biological Survey Area
- Excluded Area
- Developed, Open Space -Low Intensity (21 acres)
- Barren Lands - Mine Tailing (231 acres)
- Inter-Mountain Basins Mixed Salt Desert Scrub (2,887 acres)

**WEST KIRKLAND MINING INC.**

**THREE HILLS MINE PROJECT**

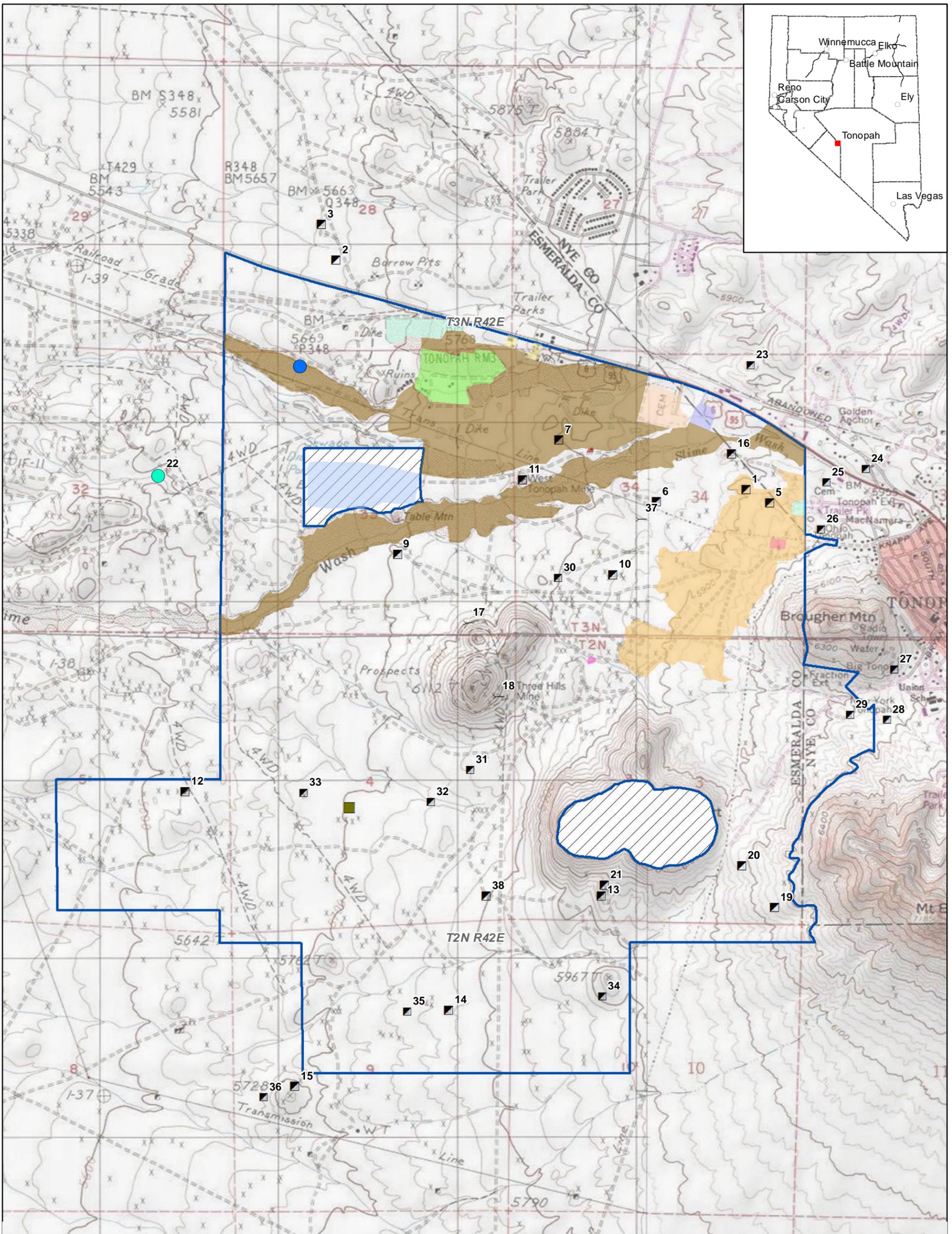
**Field-Verified  
Vegetation Communities**

Figure G



Date:	09/16/2014	Drawn By:	GSL/SCH
Revised:		Project No.:	3288
Base Map:	USGS 7.5' quads: Tonopah, Mount Butte		
File Name:	3288XH_ThreeHillsMine_FIG4_VegComm.mxd		





**Explanation**

- |                        |                                |   |
|------------------------|--------------------------------|---|
| Biological Survey Area | Abandoned Buildings            | Lambertucci-Roma Ranch                      |
| Excluded Area          | Apartment Complex              | Pet Cemetery                                |
| Pooled Water           | Cinder block building          | Historic Mine Tailings                      |
| Horse Spring*          | Electric Substation            | Former Agricultural Field                   |
| Adit*                  | Historic Dump Area             | Tonopah Cemetery                            |
| Mine Shaft*            | Waste Water Treatment Facility | Residential Neighborhood Extending into BSA |
| Pet Grave              |                                |   |

**WEST KIRKLAND MINING INC.**

**THREE HILLS MINE PROJECT**

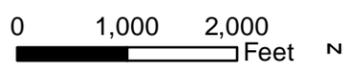
**Anthropogenic and Hydrologic Features**

Figure

Date: 09/16/2014 Drawn By: GSL/SCH  
 Revised: Project No.: 3288  
 Base Map: USGS 7.5' quads: Tonopah, Mount Butte  
 File Name: 3288XH\_ThreeHillsMine\_FIG3\_Anthro.mxd



\*Note: The numbers associated with these features correlate to the identification numbers listed in Table 6.



## **APPENDIX A**

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### **Mortality Report Forms**

**NEVADA DEPARTMENT OF WILDLIFE**       **HABITAT BUREAU**

***Industrial Artificial Pond Permit · Quarterly Wildlife Mortality Report Form***

Project Title: \_\_\_\_\_ Permit #: \_\_\_\_\_

Address: \_\_\_\_\_ County: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Mine ID # \_\_\_\_\_ Report Year: \_\_\_\_\_ Quarter: Jan - Mar  Apr - Jun  Jul - Sep  Oct - Dec

Wildlife Mortality Identification

 (I) <b>Raptors</b>	 (III) <b>Upland Game</b>	 (V) <b>Shorebirds</b>
 (II) <b>Songbirds</b>	 (IV) <b>Waterfowl</b>	 (VI) <b>Mammals</b>

*Please list number and species under each category (DO NOT leave blank)*

**Example:**

RAPTOR (I) ..... 0

SONGBIRD (II) ..... 1 sparrow, 2 wren

UPLAND GAME (III) ..... 1 quail

WATERFOWL (IV) ..... 3 mallard, 1 bufflehead, 4 gadwall

SHOREBIRD (V) ..... 0

MAMMAL (VI) ..... 4 mice, 2 skunk, 1 ground squirrel

OTHER ..... 2 lizards, 1 rattlesnake

***Mortalities Associated with Permitted Pond Solutions or Structures***

Number and Species Identification    **(DO NOT leave blank)**

RAPTOR (I) ..... \_\_\_\_\_

SONGBIRD (II) ..... \_\_\_\_\_

UPLAND GAME (III) ..... \_\_\_\_\_

WATERFOWL (IV) ..... \_\_\_\_\_

SHOREBIRD (V) ..... \_\_\_\_\_

MAMMAL (VI) ..... \_\_\_\_\_

OTHER ..... \_\_\_\_\_

*(Report Mortalities NOT Associated with Permitted Pond Solutions or Structures on Back of Form)*

REPORTER: \_\_\_\_\_ DATE: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_ PHONE: \_\_\_\_\_

