Chapter 4 Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

Chapter 4 Environmental Consequences

4.1 Impact Assessment

The Proposed Action and Action Alternatives outlined in Chapter 2 may cause, directly or indirectly, changes in the human environment. This EIS assesses and analyzes these potential changes and discloses the effects to the decision-makers and public. This process of disclosure is one of the fundamental aims of NEPA. There are many concepts and terms used when discussing impacts assessment that may not be familiar to the average reader. The following sections attempt to clarify some of these concepts.

4.1.1 Impacts/Effects

The terms “effect” and “impact” are synonymous under NEPA. Effects may refer to adverse or beneficial ecological, aesthetic, historical, cultural, economic, social, or health-related phenomena that may be caused by the Proposed Action or Action Alternative (40 CFR 1508.8). Effects may be direct, indirect, or cumulative in nature. Cumulative effects are analyzed in Chapter 5.

4.1.2 Direct Effects

A direct effect, caused by the action, occurs at the same time and place as the action (40 CFR 1508.8(a)). Direct and indirect effects are discussed in combination under each affected resource.

4.1.3 Indirect Effects

Indirect effects are reasonably foreseeable effects, also caused by the action, that occur later in time or are removed in distance from the action (40 CFR 1508.8(b)). Direct and indirect effects are discussed in combination under each affected resource.

4.1.4 Significance

The word “significant” has a very particular meaning when used in a NEPA document (40 CFR 1508.27). Significance is defined by CEQ as a measure of the *intensity* and *context* of the effects of a major federal action on, or the importance of that action to, the human environment. Significance is a function of the beneficial and adverse effects of an action on the environment.

Intensity refers to the severity or level of magnitude of impact. Public health and safety, proximity to sensitive areas, level of controversy, unique risks, or potentially precedent-setting effects are all factors to be considered in determining intensity of effect. This EIS primarily uses the terms Major, Moderate, Minor, or Negligible in describing the intensity of effects.

Context means that the effect(s) of an action must be analyzed within a framework, or within physical or conceptual limits. Resource disciplines; location, type, or size of area affected (e.g., local, regional, national); and affected interests are all elements of context that ultimately determine significance. Both long- and short-term effects are relevant.

4.1.5 Indicators

Impact indicators are the consistent currency used to determine change (and the intensity of change) in a resource. Working from an established existing condition (i.e., baseline conditions described in Chapter 3) this indicator would be used to predict or detect change in a resource related to causal effects of proposed actions.

4.1.6 Environmental Effect Categories

The following environmental effect categories (Table 4.1-1) are presented to define relative levels of effect intensity and context for each resource that is analyzed in this chapter, and to provide a common language when describing effects.

Table 4.1-1 Summary of Terms used to Describe Effects in the EIS

Attribute of Effect		Description
Magnitude (Intensity)	Negligible	A change in current conditions that is too small to be physically measured using normal methods or perceptible to a trained human observer. There is no noticeable effect on the natural or baseline setting. There are no required changes in management or utilization of the resource.
	Minor	A change in current conditions that is just measurable with normal methods or barely perceptible to a trained human observer. The change may affect individuals of a population or a small (<10 percent) portion of a resource but does not result in a modification in the overall population, or the value or productivity of the resource. There are no required changes in management or utilization of the resource.
	Moderate	An easily measurable change in current conditions that is readily noticeable to a trained human observer. The change affects 25 to 75 percent of individuals of a population or similar portion of a resource which may lead to modification or loss in viability in the overall population, or the value or productivity of the resource. There are some required changes in management or utilization of the resource.
	Major	Significant. A large, measurable change in current conditions that is easily recognized by all human observers. The change affects more than 75 percent of individuals of a population or similar portion of a resource which leads to significant modification in the overall population, or the value or productivity of the resource. There are profound or complete changes in management or utilization of the resource. An impact that is not in compliance with applicable regulatory standards or thresholds.
Duration	Transient/Temporary	Short-lived (i.e., during construction)
	Short-term	10 years or less
	Long-term	More than 10 years

4.1.7 Mitigation

Where applicable, mitigation measures are proposed in this document. Mitigation measures are means to address environmental impacts that are applied in the impact analysis to reduce

intensity of or eliminate the impacts. To be adequate and effective, CEQ rules (40 CFR 1508.20) require that mitigation measures fit into one of five categories:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action;

(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation;

(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or

(e) Compensating for the impact by replacing or providing substitute resources or environments.

4.2 Water Resources

4.2.1 Indicators

Project-related activities have the potential to affect water resources through short- and long-term surface disturbance, as well as groundwater withdrawals for mine use. The following indicators have been identified in order to evaluate potential project impacts on water resources, including their potential project activity cause:

- Changes in suspended sediment, turbidity, pH, and contaminants of concern in downgradient streams, ponds, and other surface waters;
- Changes in volume and timing of surface water runoff;
- Changes in volume and timing of discharge from springs;
- Changes in groundwater quality; and
- Potential changes in availability of groundwater to downgradient water rights holders and other water users.

In order to compare effects associated with the Proposed Action, Action Alternatives, and the No Action Alternative, these indicators were considered both independently and in conjunction with one another.

4.2.2 Proposed Action

For the discussion of potential impacts to water resources as a result of the Proposed Action, the water resources associated with the project are categorized as either surface water or groundwater resources. The baseline surface water and groundwater resources potentially affected by the Proposed Action are described in detail in Section 3.2.

Construction

Surface Water

Potential environmental impacts to surface water resources during construction include possible increases in suspended sediment and turbidity in dry drainages due to increased erosion resulting from vegetation clearing, topsoil stockpiling, fugitive dust from construction vehicles and earth-moving activities, and general soil disturbance. Because surface water resources in the area are ephemeral to intermittent, the potential increased erosion and subsequent sediment delivery to dry drainages would occur during runoff from snow melt and rainstorms. As described in detail in the POO (Midway, 2012), and summarized in Section 2.3.14, extensive stormwater controls such as drainage diversion ditches, sediment control basins, straw bales, and other EPMs would be implemented to divert stormwater and snow melt around disturbance areas and control the transportation of sediment. Whenever practical, Midway would reclaim disturbed surfaces concurrent with construction and operations. Planned reclamation strategies include contouring, covering with growth medium, and seeding to hold soil in place during runoff (Midway, 2012).

Runoff that is contained in on-site sediment control basins would not discharge downstream in the existing drainage channels, thus reducing the flow of surface water out of the project area compared to baseline conditions.

There are no mapped springs or seeps within the Proposed Action project area; however, there is an unnamed spring located approximately 0.25 miles due south and upgradient of the area. Based on topographic analysis, the unnamed spring in T16N, R55E, NE/4 Section 15 is not downgradient of any mine facilities or disturbance, and therefore would not be impacted by the Proposed Action or any Action Alternatives.

There are no identified wetlands within or in close proximity to the project area.

The potential for hazardous materials or other wastes to spill and subsequently affect surface water quality would be minimized through implementation of secondary containment features and the Spill Contingency and Emergency Response Plan (Midway, 2012).

Groundwater

Water for dust control, fire suppression and soil compaction use during construction would be obtained from on-site water wells. This water would be stored in temporary tanks or ponds to fill water trucks that would transport the water to the place of use. The amount of water used during construction would be less than that used during operations so the environmental impact of groundwater withdrawal would be less than that described below for operations. Figure 2.3-11 shows the location of the water supply wells.

The depth to groundwater beneath the project area ranges from 650 to 800 feet bgs and, therefore, would not be encountered by the proposed construction or mining activities. The potential for hazardous materials or other wastes to spill and subsequently affect groundwater

quality would be minimized through implementation of the Spill Contingency and Emergency Response Plan (Midway, 2012).

Construction is expected to take up to one year to complete. With implementation of the EPMs outlined in Section 2.3.14, the impacts to surface water and groundwater resources resulting from the construction phase of the Proposed Action are expected to be short-term and minor.

Operations, Maintenance, and Reclamation

Operations and maintenance would begin simultaneously with construction and would have similar types of impacts to surface water and groundwater resources as during the construction phase.

Surface Water

Sediment delivery to the dry drainages in the project area may increase under the Proposed Action due to an increase in erosion resulting from the removal of vegetation; stockpiling of topsoil; fugitive dust from operations; potential mine-influenced drainage from WRDAs; disturbance associated with roads and other ancillary facilities; and general soil disturbance. These impacts would occur primarily during snow melt and storm water runoff events. As noted above, extensive stormwater controls such as drainage diversions, sediment control basins, straw bales and other EPMs would be implemented to divert stormwater and snow melt around disturbance areas and control sediment transport (Midway, 2012).

Runoff from the project area in the existing drainage channels would be reduced during operations. Runoff that would be collected in sediment control basins would not be discharged downstream. Precipitation that would fall on the open pits, heap leach pad, and process ponds would be contained within those facilities and would not be discharged downstream of the project area.

There are no springs or seeps within the Proposed Action project area. Impacts to the one spring located approximately 0.25 miles from the project area and up-gradient from it are expected to be the same during operations, maintenance, and reclamation as during the construction phase of the project (i.e., no effect).

Groundwater

Water for process use, dust control, fire suppression, and potable (drinking and sanitary) use would be obtained from on-site groundwater wells (Figure 2.3-11). Water would be pumped to a fresh water tank that would gravity feed into the fire suppression, process circuit, and potable water systems. A separate tank for potable water would be located near the administration building; this water would be treated in accordance with Nevada drinking water regulations. A septic system and leach field would also be located near the administration building, and biosolids would be pumped and disposed of offsite by a licensed septic waste hauler as needed.

In order to assess the potential impact to groundwater during the operations, maintenance, and reclamation phase of the Proposed Action, acid-base accounting and metals leaching potential tests were performed on a variety of rock samples at the site.

Acid Base accounting (ABA) and metals leaching potential tests were performed on over 600 rock samples from the site. Based on the results of this testing, using parameters established by NDEP and BLM guidelines, the majority of waste rock samples were found to be non-acid generating with an overall low to moderate potential for metals leaching (Midway, 2012; Interralogic, 2012a). Waste rock from the South Pan Pit has very low sulfur content (average sulfide sulfur less than 0.1 percent) and has a high neutralizing potential due to the high percentage of limestone (approximately 70 percent). The waste rock from the North Pan Pit has a higher percentage of samples considered potentially acid generating. Using Nevada BLM criteria, the majority of waste rock samples are considered non-acid generating, having both a net neutralization potential greater than 20 tons of material per thousand tons of calcium carbonate and a neutralization to acid potential ratio (NP:AP) of greater than 3 (Midway, 2012). Using the NDEP criteria the percentage of samples considered non-acid generating increases to 90 percent. Results of meteoric water mobility procedure (MWMP) analyses showed a low metals-leaching potential with only arsenic and thallium having some leaching potential. Each of these elements was slightly above its respective Nevada groundwater Profile 1 Reference Value of 0.01 mg/L and 0.002 mg/L. Complete results can be found in Table 6, of the Midway Gold US Inc Final Baseline Geochemistry Report (Interralogic 2012a). Consequently the potential for acid rock drainage and/or metals leaching from the WRDAs is considered low (Midway, 2012).

The process ponds for the barren and pregnant solutions would be double-lined with an 80-mil HDPE primary liner and a 60-mil HDPE secondary liner, and would include a leak detection system. The heap leach pad would have an 80-mil HDPE liner placed over a low-permeability soil sub-grade. These design features are intended to eliminate leakage of process solutions to surface water or groundwater during the operations and post-closure periods for these facilities. During closure activities, the spent leach material on the heap would be rinsed with water to reduce reagent and dissolved metals concentrations in the heap drainage to the solution ponds. During the post-closure period, the heap leach would be capped with soil and vegetation to minimize long-term recharge of the spent leach material in the heap. Long-term drainage from the heap would be managed through evapo-transpiration in the reclaimed process ponds and would not be discharged to surface water or groundwater. By design, these facilities would have negligible impacts to surface water and groundwater resources.

Precipitation collected in the open pits would evaporate or seep into the underlying bedrock. The MWMP test data indicate this water would not contain significant concentrations of pollutants due to the nature of the geology of the walls and floor of the pit (limestone). This combined with the depth to groundwater under the open pits would result in negligible impacts to groundwater quality.

The ABA and MWMP data for the waste rock indicates that runoff from the WRDAs during operations would not carry significant amounts of dissolved metals from the surface of the

WRDAs. This would be further reduced after the WRDAs are reclaimed and covered with soil and vegetation. In addition, runoff from the WRDAs would be collected in sediment control ponds downstream of these facilities to control the transport of suspended sediment from the WRDAs. The impacts to surface water from the operation and reclamation of the WRDAs would be long-term and minor.

The geochemistry data for the waste rock indicates that precipitation recharging the WRDAs would not be expected to transport significant amounts of dissolved constituents to the underlying bedrock aquifer. This, combined with the depth to groundwater of 650 to 800 feet, indicates that impacts to groundwater quality from the operation and reclamation of the WRDAs are considered long-term and negligible to minor.

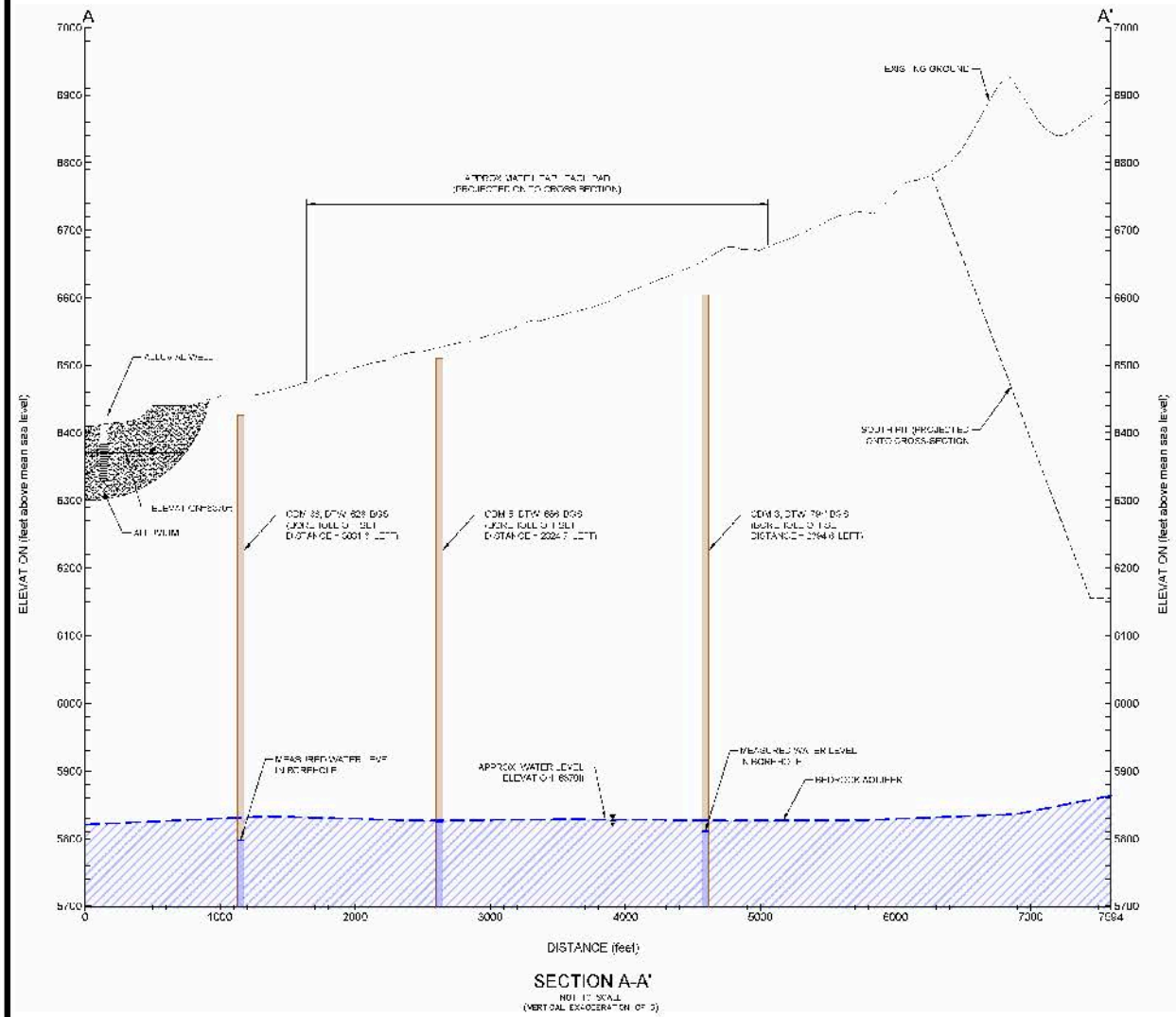
Figure 4.2-1 provides a cross-section of the area underlying the proposed mine facilities. It shows the inferred groundwater elevation (5,870 feet AMSL) based on three boreholes and indicates that the bottom elevation of the proposed south pit (6,150 feet AMSL), also shown on the cross-section, would be approximately 280 feet above the water table and would not intercept groundwater.

Water for processing needs, fire suppression, and potable water needs (drinking and sanitary uses) would be obtained from two or more groundwater wells, drilled into the deep calcareous aquifer. The operations, maintenance, and reclamation phase of the Proposed Action is expected to last 28 years. The mine would be active for 13 of the 28 years, which could impact the groundwater table more than the one-year construction phase.

In September 2012, Interralogic conducted a pump test of the Midway production well, PW-1 (Figure 3.2-6). A 125-horsepower pump was placed at 843 feet bgs in the carbonate bedrock aquifer and pumped wide open for four days. The average discharge rate was measured at 515 gallons per minute (gpm) with no decreasing trend in production observed. Water levels were recorded in the pumping well and the nearby (approximately 250 feet) observation well (OBS-1) using recording transducers. Water levels were also measured in deep monitoring well (DMW-1) 2.4 miles away, but no change in the water level was observed there during the test. Maximum drawdown in the pumping well occurred almost immediately and remained relatively stable throughout the test, averaging slightly less than 12 feet; following the four-day test the drawdown recovered to zero drawdown (pre-pumping level) rapidly (Interralogic 2012a).

Interralogic modeled the results of the pump test to predict the long-term impacts of the project on the carbonate bedrock aquifer. The model used the following assumptions:

- Activities affecting groundwater levels at the site are limited to water supply pumping in the carbonate aquifer;
- Project average water requirement of 750 gpm;
- Mine life is 13 years;



SECTION A-A'

NOT TO SCALE

(VERTICAL EXAGGERATION OF 5)

LEGEND:

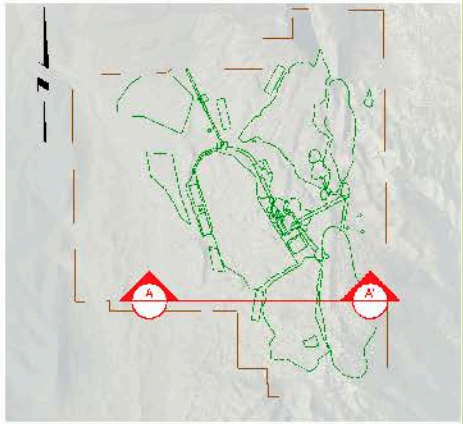
ALLUVIUM

CARBONATE BEDROCK

NOTES:

1. DTW = DEPTH TO WATER
2. BGS = BELOW GROUND SURFACE
3. BOREHOLE OFFSET VALUE SHOWN IS PERPENDICULAR DISTANCE MEASURED FROM BOREHOLE CENTER TO CROSS SECTION A–A'

CROSS-SECTION LOCATION



Source: Interralogic (2012). Groundwater Monitoring Plan

FIGURE 4.2-1
CONCEPTUAL CROSS-SECTION OF MINE AREA

MIDWAY GOLD US, INC.
PAN PROJECT

DATE DRAWN: 8/15/2012

Drawn by: CLG

U.S. BUREAU OF LAND MANAGEMENT
ELY DISTRICT OFFICE
EGAN FIELD OFFICE

- If possible, the water requirement would be met by pumping of the PW-1 water supply well and additional pumping wells, as necessary;

- Local recharge to the aquifer is negligible due to the generally low precipitation and time scale of the analysis; and

- The aquifer has a thickness equal to the screened interval of the production well (301 feet).

The model was run over a range of hydraulic conductivities and storage coefficients. The maximum extent of the drawdown occurred within the boundary of the project area for the base and high conductivity cases. For the low conductivity and low storage case the results indicated that the maximum extent of the 10-foot aquifer drawdown contour might extend past the project area boundary, but would still be more than three miles from the nearest actively producing well location (Interralogic 2012a).

Midway would implement a groundwater monitoring plan to detect any changes in groundwater level and quality that may be associated with mining activities (Interralogic, 2012b). The monitoring plan includes a network of monitoring wells in both the deep carbonate aquifer and the perched alluvial aquifer below and downgradient of the project area (Interralogic, 2012b). Upon mine abandonment, the exploration and groundwater monitoring bore holes and wells would be plugged and abandoned per state regulations.

Under the reclamation plan, all facilities would be reclaimed to the extent practicable, including grading, covering with plant growth medium, and revegetation to minimize potential erosion and reduce recharge by precipitation into the spent heap leach material and WRDAs.

Consequently, with implementation of the proposed design features and EPMs outlined in Chapter 2, the impacts to surface and groundwater resources resulting from operation and maintenance of the Proposed Action are expected to be long-term and negligible to minor. No operations or other disturbance would occur in either the Little Smoky or the Railroad Valley, so no impacts would be expected in those drainages.

Water Rights

There is the potential for Midway's water use to cause reduced availability of groundwater in the basin, through drawdown of the groundwater table. Midway estimates that it would use water at an average rate of approximately 400 gpm. This equates to approximately 645.5 afy, which represents 5.5 percent of current use in Newark Valley and 3.35 percent of NDWR perennial yield. The amount of water consumption necessary for the Proposed Action can be explained in terms of water consumption correlating to a certain stage of the project (i.e. exploration, construction, construction/initial operations, and general operating levels). Exploration would potentially consist of the lowest water consumption, and it is anticipated that only a few truckloads of water per day would be required for each drill, plus the water necessary for dust control. The construction stage water usage is dependent on weather conditions during construction. Water usage during construction would be much higher than is required for the

initial exploration stage. The construction stage would require water consumption for not only the continued exploration activities, but also dust control for roads and the increased traffic and construction activities. Water would be necessary for mixing concrete, soil conditioning and compaction purposes for construction of the leach pad base, building sites and roads. During late construction/initial operations, water usage would potentially reach the highest level due to the need to build the solution inventory, within the barren pond first, and then wet up the heap and bring the heap leach process up to operating capacity and exploration activities would continue during this stage as well as the necessary dust control measures. Once the initial start-up is completed, mining operations and water consumption would drop to general operating levels, which would be slightly lower than construction/initial operations.

Midway is leasing approximately 1,200.6 afy from eight permitted Applications to Appropriate the Public Waters of the State of Nevada within the Newark Valley Basin. These permitted applications have a total allowed appropriation of approximately 5,647 afy within the Newark Valley Basin. Approximately 2,016 afy of the permitted appropriations were used for irrigation in 2011 (NDWR, 2011). Midway has leased 1,200.6 afy instead of the anticipated water requirement of 645.5 afy to account for potential weather conditions that could increase their water usage. The anticipated 645.5 afy water usage for the project, as well as the leased 1,200.6 afy, are far below the 5,647 afy appropriated for use with the eight applications. It is unknown whether the leased water represents wet rights or paper rights, to be conservative, it must be assumed that these are paper rights and represent added water use to the Newark Basin. This would raise the annual use to 11,945.26 afy (see Section 3.2.3), which is still substantially below the 18,000 afy perennial yield for the basin.

Coupled with the results of the pump test, showing that maximum drawdown from the Midway supply wells would be less than 10 feet for any actively used well within the Newark Valley Basin, this would be considered a long-term, minor impact.

4.2.2.1 Mitigation

Additional mitigation measures are not required.

4.2.2.2 Unavoidable Adverse Impacts on Water Resources

Unavoidable adverse impacts on water resources would be unlikely to occur as a result of surface disturbance associated with the Proposed Action. The implementation of EPMs would minimize potential degradation of surface water and groundwater quality and water use would be limited.

4.2.2.3 Irreversible and Irretrievable Commitments of Resources

There would be no irreversible and/or irretrievable commitments of water resources as a result of the Proposed Action.

4.2.2.4 Relationship of Short-Term Uses and Long-term Productivity

A minor amount of water resources would be affected during the life of the project, but, in the long-term, impacts to long-term productivity of the water resources would be negligible to minor.

4.2.3 Waste Rock Disposal Site Design Alternative

The Waste Rock Disposal Site Design Alternative would result in the same types, intensity and duration of impacts as described under the Proposed Action alternative.

4.2.3.1 Mitigation

Mitigation for the Waste Rock Disposal Site Design Alternative would be the same as for the Proposed Action, except it would result in approximately 79 fewer acres of disturbance.

4.2.3.2 Unavoidable Adverse Impacts on Water Resources

Unavoidable adverse impacts would be the same as that described under the Proposed Action.

4.2.3.3 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be the same as that described under the Proposed Action.

4.2.3.4 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term and long-term uses and long-term productivity would be the same as that described under the Proposed Action.

4.2.4 Southwest Power Line Alternative

The Southwest Power Line Alternative involves construction of a power line and an associated maintenance road (Figure 2.4-2). The surface disturbance area for this Alternative would be closer to identified surface water features than the Proposed Action. Once the ROW for the Southwest Power Line Alternative diverges from SR 379, it crosses numerous dry washes identified as intermittent in the NHD. There are also several locations where the Southwest Power Line Alternative ROW coincides with the channels of these dry washes.

During construction there is the potential that stream banks could be breached, which would increase active channel erosion. After construction is complete there is the potential that the maintenance road could be used by recreationists and vehicles, which would also increase erosion, resulting in an increase in suspended sediment and turbidity of surface water resources. Because the ROW for this Alternative follows mapped intermittent stream channels, the potential impacts from the Southwest Power Line Alternative would be considered long-term and moderate.

Impacts from other project facilities for construction, operation, maintenance, and reclamation activities would be the same as for the Proposed Action.

4.2.4.1 Mitigation

Mitigation for the Southwest Power Line Alternative would be to locate the actual disturbance of the power line (structures and access road) out of stream channels to the extent possible.

4.2.4.2 Unavoidable Adverse Impacts on Water Resources

If actual disturbance of the power line can be relocated out of stream channels, unavoidable impacts would be long-term and minor.

4.2.4.3 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be the same as for the Proposed Action.

4.2.4.4 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term and long-term uses and long-term productivity would be the same as for the Proposed Action.

4.2.5 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be constructed and there would be no associated project impacts on water resources excluding the previously authorized exploration activities as discussed in Section 2.2. Potential impacts to water resources from this approved action were dismissed from analysis under the EA prepared for the authorized exploration activities (BLM, 2011b); consequently it is assumed that there have been negligible impacts to water resources. On abandonment the exploration and groundwater monitoring bore holes and wells would be plugged and abandoned per state regulations.

4.3 Geology and Minerals

4.3.1 Indicators

The primary indicators for the geology and minerals are the number and type of mining claims, geothermal nominations, and oil and gas leases in the project area disturbance footprint.

4.3.2 Proposed Action

Under the Proposed Action, geology and minerals would be directly affected by the removal of ore-bearing materials and overburden/waste rock. This would be a long-term, major, local impact on these resources. The ore would be crushed and then processed using a central heap-leach facility. The heap leach capacity for the life of the mine is estimated to be 68,000,000 tons. The waste rock would be placed in WRDFs where the materials would be subject to surficial weathering and infiltration of precipitation. Effects of this contact with water were evaluated in Section 4.2.

There are presently no geothermal leases, coal authorizations, solar energy and wind ROWs, or oil shale leases present within two miles of the Proposed Action project facilities that could be impacted. There are 17 active mining claim lead files and five authorized oil and gas leases located within two miles of the Proposed Action project facilities.

Existing topography of the project area would be modified by the proposed mining and mineral processing facilities. The summary of the basic design parameters and dimensions of the proposed pits are shown in Table 4.3-1.

Table 4.3-1 Pit Design Parameters and Dimensions

Open Pit	Slope (degrees)	Length (feet)	Width (feet)	Acres	Maximum Depth (feet)	Pit Bottom Elevation (feet AMSL)
South Pan Pit	45	2,500	1,000	92	480	6,150
North Pan Pit	45	4,100	400-1,000	247	580	6,150
Black Stallion Pit	45	1,360	770	13[1]	240	6,440
South Syncline Pit	55	550	500	2[1]	180	6,520
Syncline Pit	55	750	800	10[1]	180	6,520
North Syncline Pit	40	450	340	5[1]	110	6,520

[1]The Black Stallion, North Syncline, Syncline, and South Syncline pits are satellite pits that would be mined concurrently with the North and South pits. These pits would be backfilled upon completion of mining to allow other facilities to be located on the same footprint. These pits would not be present at the end of mining (Midway, 2012).

For the Proposed Action mining is anticipated to generate approximately 127,100,000 tons of waste rock, which would be placed in two WRDAs, the North WRDA at 264 acres (62,152,000 tons) and the South WRDA at 216 acres (60,295,000 tons) and backfilled into the satellite pits; about 4,615,000 tons would come from the four smaller pits. The total anticipated tons of ore mined for the project would be approximately 149,000,000 tons (Gustavson, 2011). The North Syncline Pit would be backfilled with about 0.7 million tons, the Syncline Pit would be backfilled with about 1.7 million tons, the South Syncline Pit would be backfilled with about 0.2 million tons, and the Black Stallion Pit would be backfilled with about 4.2 million tons. Both WRDAs would be located along the western perimeters of their respective pits. A summary of basic design parameters and dimensions for the proposed WRDAs is shown in Table 4.3-2.

Table 4.3-2 WRDA Design Parameters and Dimensions

WRDA	Width (feet)	Length (feet)	As-Built Slope (degrees)	Reclaimed Slope (degrees)	Height (feet)	Crest Elevation (feet)
North WRDA	4,000	6,200	12-19	12-19	190	6,830
South WRDA	2,700	5,000	10-17	10-17	160	6,930

The anticipated level of impacts to geology and minerals under the Proposed Action from the operations, maintenance, and reclamation of the mine and associated facilities would be long-term and major to the local geology.

4.3.2.1 Mitigation

Project design features, EPMs (Section 2.3.14), and the Reclamation Plan are elements of the Proposed Action designed to reduce environmental impacts to topography. Additional mitigation measures are not required.

4.3.2.2 Unavoidable Adverse impacts on Geologic and Mineral Resources

Local geologic resources would be impacted by the removal of the ore and waste rock planned to be mined under the Proposed Action. Unreclaimed pit highwalls and road cuts and reclaimed overburden fills and the heap leach would present localized, permanent modifications of topography.

4.3.2.3 Irreversible and Irretrievable Commitments of Resources

Ore would be removed from the Pancake Range reserves, and this would be an irreversible and irretrievable commitment of mineral resources. This would be a relatively minor loss compared to total gold reserves available for future mining in Nevada.

Impacts to the local natural topographic conditions under the Proposed Action and the Alternatives would be irreversible and irretrievable. Reclamation activities would restore disturbed sites to topographic contours that mimic pre-mining conditions and permanently reduce the impacts to local topography. Disturbed areas that are not regraded during reclamation would have permanent impacts to topography.

4.3.2.4 Relationship of Short-Term Uses and Long-Term Productivity

The project is anticipated to have a mining period of 13 years, with associated construction, closure, remediation, and post-closure monitoring extending the project life to 28 years. The geology and minerals resources would be disturbed and removed in the short-term. The long-term mineral resource productivity would be limited with the removal of the mineral resources.

4.3.3 Waste Rock Disposal Site Design Alternative

Under the Waste Rock Disposal Site Design Alternative, the impacts to geologic resources would be the same as the Proposed Action. However, this alternative would have different topographic impacts related to the WRDAs. This alternative would have three WRDA's, the northwest WRDA at 97 acres, the northeast WRDA at 102 acres, and the South WRDA at 202 acres. The northwest and north east WRDA's would be located adjacent to the west and east perimeter of the North Pan Pit and the South WRDA would be located adjacent to the western perimeter of the South Pan Pit. A summary of basic design parameters and dimensions for the Waste Rock Disposal Site Design Alternative WRDAs are shown in Table 4.3-3. The impacts from this alternative would result in the same types of impacts as described under the Proposed Action, except it would result in approximately 79 fewer acres of disturbance.

Table 4.3-3 Alternative WRDA's Design Parameters and Dimensions

WRDA	Width (feet)	Length (feet)	As-Built Slope (degrees)	Reclaimed Slope (degrees)	Height (feet)	Crest Elevation (feet)
Northwest WRDA	2,470	2,500	10 to 18	10 to 18	320	6,850
Northeast WRDA	1,900	3,500	9 to 18	9 to 18	200	6,930
South WRDA	2,900	4,570	15 to 18	15 to 18	430	7,025

The anticipated level of impacts to geology and minerals from the operations, maintenance and reclamation of the mine and associated facilities would be the same as the Proposed Action.

4.3.3.1 Mitigation

Project design features, EPMs, and the Reclamation Plan are elements of the Proposed Action designed to reduce environmental impacts to topography. Additional mitigation measures are not required.

4.3.3.2 Unavoidable Adverse Impacts on Geologic and Mineral Resources

Unreclaimed pit highwalls and road cuts and reclaimed overburden fills and heap leach would present localized, permanent modifications of topography.

4.3.3.3 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be essentially the same as for the Proposed Action, except it would result in approximately 79 fewer acres of disturbance.

4.3.3.4 Relationship of Short-Term Uses and Long-Term Productivity

Relationship of short-term uses and long-term productivity would be essentially the same as for the Proposed Action.

4.3.4 Southwest Power Line Alternative

Under the Southwest Power Line Alternative, the impacts to geology and minerals would be the same as the Proposed Action except for the topographic disturbances in Smoky Valley associated with the power line and associated maintenance road. The Southwest Power Line Alternative would have a total disturbance of 68.3 acres compared to 5.4 acres of disturbance for the Proposed Action power line. This would be a long-term, minor, local impact to geological resources.

The anticipated level of impacts to geology and minerals under the Southwest Power Line Alternative from the operations, maintenance, and reclamation of the mine and associated facilities would be the same as the Proposed Action.

4.3.4.1 Mitigation

Additional mitigation measures are not required.

4.3.4.2 Unavoidable Adverse Impacts on Geologic and Mineral Resources

Unavoidable adverse impacts on geologic and mineral resources would be essentially the same as that described under the Proposed Action.

4.3.4.3 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments to resources would be the same as that described under the Proposed Action.

4.3.4.4 Relationship of Short-Term Uses and Long-Term Productivity

Short-term uses and long-term productivity would be to the same as that described under the Proposed Action.

4.3.5 No Action Alternative

Under the No Action Alternative, authorized exploration activities would continue as discussed in Section 2.2. Impacts to geologic resources under the No Action Alternative would be negligible. Topographic changes due to road building and drill pad construction and minimal mineral removal due to exploratory drilling and trenching for bulk metallurgical samples and soil samples would be negligible.

4.4 Paleontological Resources

4.4.1 Indicators

The analysis of impacts to paleontological resources is based on a project-specific paleontological resources assessment that included a literature review of known resources and assignment of paleontological sensitivity based on sediments. The following indicators were considered when analyzing potential impacts to paleontology:

- Known paleontological resources;
- Proximity to geologic strata with potential to contain paleontological resources; and
- Depth of excavations associated with project components.

Impacts to specific paleontological resources are not presented, as paleontological resources are generally located by active discovery during surveys, by chance during man-made disturbances, by exposure due to erosion, or other means. Known paleontological resources were reviewed and used to determine potential paleontological sensitivities as presented in Section 3.2.

4.4.2 Proposed Action

Effects to paleontological resources could occur from the disturbance of the ore and waste rock during the mining of the pits and the construction of the facilities. Rock units disturbed would be Quaternary sediments; Tertiary volcanics; Cretaceous intrusives; Permian Rib Hill sandstone and Ely limestone; Mississippian Chainman shale, Joana limestone, Pilot shale; and Devonian Devils Gate limestone. Of these units, only the limestones are known to contain invertebrate fossils. There are no known rare or sensitive occurrences of such fossils in these units at the project area. Quaternary sediments could contain vertebrate fossils but none are known to exist at the project area. Invertebrate fossils in the geologic units that would be disturbed are likely to be found throughout the outcrop area of these formations in central Nevada. Under the Proposed Action, there would be no to negligible effects to paleontological resources, as there are no known and low potential for meaningful paleontological resources in the project area.

Significant fossils encountered would be excavated and curated, adding to the scientific database; this would be an indirect long-term beneficial impact.

4.4.2.1 Mitigation

Mitigation measures are not required.

4.4.2.2 Unavoidable Adverse Impacts on Paleontological Resources

There would be no unavoidable adverse effects to paleontological resources.

4.4.2.3 Irreversible and Irretrievable Commitments of Resources

There would be no irreversible or irretrievable commitments of paleontological resources.

4.4.2.4 Relationship of Short-Term Uses and Long-Term Productivity

There would be no meaningful, short-term uses of paleontological resources under the Proposed Action; therefore, there would be no effects to the long-term productivity.

4.4.3 Waste Rock Disposal Site Design Alternative

Under the Waste Rock Disposal Site Design Alternative, the impacts would be the same as the Proposed Action, except it would result in approximately 79 fewer acres of disturbance.

4.4.3.1 Mitigation

Mitigation measures are not required.

4.4.3.2 Unavoidable Adverse Impacts on Paleontological Resources

There would be no unavoidable adverse effects to paleontological resources.

4.4.3.3 Irreversible and Irretrievable Commitments to Resources

There would be no irreversible or irretrievable commitments of paleontological resources.

4.4.3.4 Relationship of Short-Term Uses and Long-Term Productivity

There would be no meaningful short-term uses of paleontological resources; therefore, there would be no effects to the long-term productivity.

4.4.4 Southwest Power Line Alternative

Under the Southwest Power Line Alternative, the impacts to paleontology would be essentially the same as the Proposed Action.

4.4.4.1 Mitigation

No mitigation measures are required.

4.4.4.2 Unavoidable Adverse Impacts on Paleontological Resources

There would be no unavoidable adverse effects to paleontological resources.

4.4.4.3 Irreversible and Irretrievable Commitments to Resources

There would be no irreversible or irretrievable commitments of paleontological resources.

4.4.4.4 Relationship of Short-Term Uses and Long-Term Productivity

There would be no meaningful, short-term uses of paleontological resources; therefore, there would be no effects to the long-term productivity.

4.4.5 No Action Alternative

Under the No Action Alternative there would be no impacts other than the exploration activities that have already occurred. There would be no to negligible effects to paleontological resources, as there are no known and low potential for meaningful paleontological resources in the project area.

4.5 Soils

4.5.1 Indicators

Indicators used to assess potential impacts to soil resources include the following:

- Acres of soil disturbance and acres to be reclaimed; and
- Suitability of topsoil resources (growth medium) for reclamation.

4.5.2 Proposed Action

Anticipated environmental impacts to soil resources include the potential loss of productive topsoil in disturbed areas, increased wind and water erosion, and potential of contamination of soils from spills of chemicals during transportation, storage, and use.

Construction

The Proposed Action includes approximately 3,204 acres of direct impacts to the soil resource within the project area (Figures 3.5-1 and 3.5-2). Surface disturbance during construction would include the removal of topsoil resources for use during reclamation. Direct physical impacts to soil resources include compaction and crushing of the topsoil by equipment during salvage, stockpiling, and construction. Soil compaction can contribute to soil erosion and reduced soil productivity. Soils in the project area characteristically have a high percentage of coarse fragments, which would provide moderate support for heavy equipment by reducing the amount of compression on the underlying soils.

Physical effects of soil compaction would be long-term, minor to moderate, and include reduced permeability and porosity, damage to microbiotic crusts, increased bulk density, decreased available water holding capacity, and increased erosion potential. Soil microorganisms such as bacteria and fungi, important in the decomposition of biological materials and the formation and improvement of soil, would be impacted. Natural processes, such as wind and water transport of soil particles from surrounding areas would continually inoculate the site with these microorganisms.

Soil productivity is defined as the capability of a soil for producing a specific plant under specific management (USDA, 1993). Factors that influence soil productivity include climate, length of growing season, and soil characteristics such as texture, depth, and fertility. Impacts to the soil resource such as erosion and compaction can reduce soil productivity. Productivity of stockpiled growth medium would be directly affected by mixing of the soils during salvage operations. The incorporation of vegetative materials into the growth medium stockpiles during stripping would increase the organic matter content of the topsoil material, helping to increase potential productivity. The mixing of soils characteristic of low productivity (i.e. high salt content, clayey texture, or high coarse fragment content) with soils characteristic of higher productivity (i.e. low salt content, loamy texture, or low coarse fragment content) may serve to dilute negative soil characteristics and potentially increase the production potential of the growth medium.

Soil erosion potential is determined based on physical soil characteristics, k-factor rating, and slope. Areas located on steep slopes are inherently susceptible to erosion. Potential for erosion would be increased on disturbed areas after soil salvage operations due to removal of the vegetative cover and the loss of surface soil structure.

Soil characteristics identified in Section 3.5 suggest that disturbed areas would experience low to moderate erosion potential either by wind or water. The wind erosion hazard is expected to be low to moderate due to the high percentage of coarse fragments throughout the soil profiles of many soils in the project area (USDA, 1990). Windblown dust would result from the disturbance of fine-textured soils during construction.

Construction activities would impede soil development. Soil biological activity and nutrient cycling would be substantially reduced or eliminated in deeper portions of growth medium stockpiles.

Exposure and disturbance of soils could increase the potential for accelerated soil erosion from sites affected by construction. Excavation, transportation, and placement of growth medium also could promote the breakdown of soil aggregates into loose soil particles, increasing the potential for wind and water erosion. Measures to stabilize and protect growth medium stockpiles, such as protected stockpile locations and stockpile seeding, would be implemented to minimize soil loss. Additionally, the establishment of a temporary vegetative cover may aid in reestablishing biological activity within the soil. Reclamation and revegetation efforts would return some areas of soil disturbance to a productive state following construction, thereby reducing the duration and magnitude of impact for some areas, but the majority of construction disturbance would continue long-term to support operations.

Physical and chemical changes to the soil as a result of Proposed Action construction activities would be expected to be long-term and minor to moderate, and would occur as a result of topsoil salvage and construction of mine facilities.

Operations, Maintenance, and Reclamation

Soil disturbance would continue during mining operations and maintenance. Impacts related to soil removal, compaction, and erosion, as well as continued impediment of soil development and productivity would be similar to that described under construction impacts.

Approximately 4.9 million cubic yards of primary and secondary growth medium would be available for salvage from the 3,204 acres of proposed disturbance. This is adequate to cover the 2,752 acres that would be reclaimed. The depth of growth medium varies from three to 157 inches (Tetra Tech, 2011; Tetra Tech 2012a). Growth medium would be salvaged wherever possible and reused in the area where it was salvaged. Where sufficient growth medium material is available, a minimum of six inches would be placed during reclamation. However, it is possible that some areas may not contain sufficient amounts of growth medium for reclamation. The volume of salvageable growth medium could be limited by shallow soils or soils with high percentages of coarse fragments and consequently may not provide six inches of growth medium for revegetation as specified in the reclamation plan. In such cases, all available salvaged material would be placed over the disturbance and the area ripped to achieve six inches of loosened aggregate material for plant growth.

Topsoil that is used to reclaim disturbed areas would begin to revert to more natural conditions. The total volume of growth medium available for reclamation activities would be salvaged from all disturbance areas, including permanently disturbed areas that would not be reclaimed, such as the pits, and would be expected to provide suitable depth to achieve adequate and uniform coverage for seedbed preparation and reclamation. The quality of these mixed salvage soils is likely to be similar to or slightly better than the characteristics of the individual soils prior to disturbance. Erosion of growth medium after redistribution on regraded sites would also have a greater potential until the soil is stabilized by successful revegetation. There would be approximately 452 acres of long-term disturbance associated with the Proposed Action. The North Pan Pit and South Pan Pit are not subject to reclamation (Section 2.3.13); therefore, permanent disturbance to these areas would occur (Figure 2.3-11).

After soil redistribution, biological activity would slowly increase, eventually reaching pre-salvage levels. However, reclamation vegetation rooting depth and available water-holding capacity may be limited to the six inches of growth medium. Ripping or otherwise loosening compacted surfaces prior to placement of growth medium and revegetation would aid in reclamation by reducing the interface between the compacted surface and growth medium, increasing the rooting depth and water-holding capacity of the growth medium at the reclaimed site. Loss of soil or discontinuation of natural soil development, decreased infiltration and percolation rates, decreased available water-holding capacities, breakdown of soil structures, and loss of organic material as a result of the Proposed Action would be lessened by natural soil development over time.

Reclaimed areas would be susceptible to erosion until the site naturally stabilizes over time. Although stripping, stockpiling, and redistribution adversely affect soil characteristics, including

alterations of soil profiles and soil structures, the benefits of using soil for revegetation outweigh the adverse effects of soil handling.

Additionally, direct impacts to soil from the release of mill reagents or leach solutions during operation of the facility would be minimized with the continued use of spill prevention and dust control measures (Section 2.3.14). Reclamation of heap leach pads, as described in Section 2.3.13, includes a greater depth of cover by growth medium (approximately 24 inches) in order to create a stable post-closure landform and reduce infiltration of meteoric water.

Potential indirect effects of soil destabilization and erosion would be dust generation and off-site deposition. Wind erosion of disturbed soils could impact air quality and/or result in deposition of soil particles off-site. Off-site stream sedimentation would be minimized by the use of erosion control practices described in Chapter 2. Increased sediment loads to downstream dry channels would be minimized through the use of EPMs outlined in Section 2.3.14. Sediment deposition in streams below the areas of disturbance is not anticipated, as there are no perennial streams in the vicinity of the Proposed Action, and sediment catchment basins would be placed around the base of soil stockpile and dump slopes. Dust generated by vehicular traffic would be reduced by using dust abatement techniques such as the application of wetting and binding agents on haul roads. Erosion from growth medium stockpiles would be kept at a minimum with the practice of interim seeding.

Soils impacts during operations, maintenance, and reclamation would be long-term and minor to moderate.

4.5.2.1 Mitigation

Additional mitigation measures are not required.

4.5.2.2 Unavoidable Adverse Impacts on Soils

Native soil conditions on disturbed areas would be lost due to the breakdown of soil structure, adverse effects to microorganisms, and discontinuation of natural soil development.

4.5.2.3 Irreversible and Irretrievable Commitments of Resources

The permanent impacts associated with the Proposed Action would produce an irreversible commitment of soil resources disturbed by these features.

An irretrievable commitment of soils salvaged and utilized in reclamation would initially demonstrate a decrease in infiltration and percolation rates, a decrease in available water holding capacity, and loss of organic matter. These effects would slowly be restored by natural soil development processes.

4.5.2.4 Relationship of Short-Term Uses and Long-Term Productivity

Reclamation of the temporarily disturbed areas would return these soils to long-term productivity by being utilized as growth medium in reclaimed areas, while unreclaimed areas would be eliminated from potential production.

4.5.3 Waste Rock Disposal Site Design Alternative

The Waste Rock Disposal Site Design Alternative would result in the same types of impacts as described under the Proposed Action except it would result in approximately 79 fewer acres of disturbance to soils (Section 2.4.1). With successful reclamation using salvaged growth medium on the backfill area, there would be no difference in the type of impacts to soil resources under this alternative compared with the Proposed Action. Impacts to soils would be long-term and minor.

4.5.3.1 Mitigation

Additional mitigation measures are not required.

4.5.3.2 Unavoidable Adverse Impacts on Soils

The unavoidable adverse physical impacts to soil resources would be similar to those identified in the Proposed Action, except it would result in approximately 79 fewer acres of disturbance.

4.5.3.3 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitment of resources includes the impacts of soil resources with implementation of the Waste Rock Disposal Site Design Alternative. Numerous acres of soil resources would be disturbed with implementation of the Proposed Action. The long-term impacts associated with the unreclaimed portions of the Proposed Action (Table 2.3-8; Figure 2.3-11) would produce an irreversible commitment of soil resources disturbed by these facilities.

An irretrievable commitment of soils salvaged and utilized in reclamation would initially demonstrate a decrease in infiltration and percolation rates, decrease in available water holding capacity, and loss of organic matter. These effects would slowly be restored by natural soil development processes.

4.5.3.4 Relationship of Short-Term Uses and Long-Term Productivity

Short-term use and long-term productivity would be similar to that described under the Proposed Action.

4.5.4 Southwest Power Line Alternative

The Southwest Power Line Alternative would result in the same types of impacts to soil resource as described under the Proposed Action as well as the addition of approximately 68 acres of temporary impacts associated with construction of the power line and associated maintenance road under the Southwest Power Line. Impacts to soils would be long-term but minor for the mining operations. Productivity loss due to compaction influences would be short-term and negligible to minor along the Southwest Power Line Alternative.

4.5.4.1 Unavoidable Adverse Impacts on Soils

The unavoidable adverse physical impacts to soil resources would be similar to those identified in the Proposed Action.

4.5.4.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitment of resources includes the impacts of soil resources with implementation of the Southwest Power Line Alternative. The temporary impacts associated with the construction of the Southwest Power Line Alternative would produce an irreversible commitment of soil resources disturbed by these features.

An irretrievable commitment of soils salvaged and utilized in reclamation would initially demonstrate a decrease in infiltration and percolation rates, a decrease in available water holding capacity, and loss of organic matter. These effects would slowly be restored by natural soil development processes.

4.5.4.3 Relationship of Short-Term Uses and Long-Term Productivity

Short-term uses and long-term productivity would be similar to that described under the Proposed Action.

4.5.5 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be constructed and there would be no associated project impacts on soil resources excluding those actions already approved under the Midway Gold Pan Project Exploration Amendment Environmental Assessment (BLM, 2011b). This EA amended the existing 2004 EA (BLM, 2004c) and approved an additional 100 acres of disturbance to develop a new access road, new drill pads, and new drill roads, however reclamation of these features would reduce long-term impacts.

Under the No Action Alternative impacts caused by direct soil removal, compaction, and redistribution, as well as vehicle traffic on the access road would serve to compact the soil resulting in loss of infiltration capacity, increased erosion potential, and reduction in productivity would occur.

Due to reclamation shortly after exploration activities, impacts under the No Action Alternative would be short-term and negligible to minor.

4.6 Air Resources

Given the remote nature of the project area, the primary indicator of air quality impacts for Criteria pollutants would be the Nevada and EPA NAAQS. The EPA-defined increment would also be used as indicators for Class I and Class II airsheds (there are no Class I areas within 100 kilometers of the project area). These are enforced through Nevada air permitting requirements to protect public health. The facility would require a Class II air quality permit.

The Nevada and EPA NAAQS define air pollutant concentrations that are not to be exceeded in ambient air. Significant impact levels are quantitatively defined in EPA regulations. The use of significant impact levels for indicators is a conservative approach due to the fact that the project area has not been classified as a prevention of significant deterioration area from this project nor any other projects in the vicinity, so significant contribution levels enforceable at Class I areas do not apply. Table 4.6-1 lists defined EPA and BAPC impact thresholds and impact limits for criteria air pollutants. For this analysis, ambient air quality impacts are considered minor when predicted impacts are below the Class I Significant Impact Levels (SILs), moderate when predicted impacts exceed the SILs but remain below the national and Nevada NAAQS, or major when predicted impacts exceed the national or Nevada NAAQS.

In addition to the impact assessment for criteria pollutants, this EIS also assesses the potential emissions increase associated with Hazardous Air Pollutants (HAPs) and mercury. The emissions of these pollutants were calculated for the project; however, no ambient dispersion modeling for these pollutants was completed. The Nevada air quality permitting rules do not require the assessment of HAPs for permitting purposes; however, Nevada does require the use of Maximum Achievable Reduction Technology (MACT) for mercury emissions at mine sites that include thermal units. This would be applicable to the Pan project.

Table 4.6-1 summarizes significant impact levels, as well as State of Nevada and NAAQS, for all EPA-defined criteria air pollutants.

The EPA has supported development of a set of air quality dispersion models to estimate ambient air quality impacts in areas surrounding air pollutant emission sources. The EPA recommends the use of the model most appropriate for the application based upon the nature and extent of the emission sources, the distance to potential off-site receptors, and the intervening terrain.

To assess ambient air quality impacts off-site as a result of the Proposed Action, the model AERMOD was applied. The technical specification of this modeling effort is documented in the Air Quality Modeling Impact Analysis (Air Sciences, 2012). AERMOD is one of the most frequently used regulatory dispersion models in the United States and represents the EPA's preferred model for the assessment of the near-field (up to 50 km) pollutant dispersion impacts. Since the project emissions were not sufficient to classify the source as a PSD source, use of the far-field modeling software (CALPUFF) is not required by the BLM.

Table 4.6-1 Modeling Significance Levels and Ambient Air Quality Standards

Pollutant	Averaging Period	EPA-Defined Class II Increment ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	NEVADA AAQS ($\mu g/m^3$)
Nitrogen Oxide	Annual	25	100	100
	1-hr	NA	188	NS
Sulfur Dioxide	Annual	20	NA	80
	24-hr	91	NA	365

Pollutant	Averaging Period	EPA-Defined Class II Increment (µg/m^3)	NAAQS (µg/m^3)	NEVADA AAQS (µg/m^3)
	3-hr	512	1300	1300
	1-hr	NA	196	NS
Carbon Monoxide	8-hr	NA	10,500	10,500[1]
	1-hr	NA	40,500	40,500
PM_{10}	Annual	17	NA	50
	24-Hr	30	150	150
$PM_{2.5}$	Annual	4	35	NA
	24-Hr	9	15	NA
Lead	Quarterly	NA	1.5	1.5
Ozone	8-hr	NA	146.9	NS
	1-hr	NA	NA	235[2]

NA = Not applicable

NS = No state standard formally adopted.

[1]6,670 µg/m^3 at areas equal to or greater than 5,000 feet AMSL

[2]195 in Lake Tahoe Basin.

4.6.1 Proposed Action

For the purposes of analyzing the air quality impacts, the Proposed Action included the maximum estimated emissions from future operations of the Pan Mine.

The Proposed Action analyzed consisted of an open pit gold mine, with two larger pits and four satellite pits; two WRDAs; a heap leach facility; primary, secondary, and tertiary crushers and ore stockpile; and associated processing and auxiliary sources. Emissions for the project were developed to assess conservative impacts.

The analyzed short-term emission rates for process and ancillary sources were derived from the maximum design hourly process rates. The long-term emission rates were derived using the maximum hourly process rates and estimated annual utilization factors. The modeled emission rates for fugitive sources were based on annual activity rates for the maximum production year. The modeled emission rates for the off-site sources are estimated using EPA's Motor Vehicle Emission Simulator (MOVES) model based on annual commuting and delivery information.

Process Air Pollutant Emissions

Under the Proposed Action, the Pan mine would require a Class II operating permit from NDEP and would have emissions levels that fell below the PSD major source threshold. Table 4.6-2 provides a summary of air pollutants from the Proposed Action. These are the emissions estimates that are expected to be requested as emission limits in an air permit application. The summary includes all on-site operational emissions from: point sources (modeled as single point releases) include thermal sources, combustion sources, and storage silos and process fugitives (modeled as three-dimensional releases) include crushing and transferring, and conveying and stacking.

Not included are commuter vehicles and some on-site vehicular traffic or equipment operation not related to production. These emission rates are based upon conservative assumptions that the site operates at full-load operations at the high end of the requested range of emission rates and all support systems operate sufficiently to support continuous operation. Actual operations do not typically reach these emission rates at potential maximum operation.

Table 4.6-2 Process and Ancillary Emissions (tons/year)

Source Category	$PM_{2.5}$	PM_{10}	PM	CO	NOx	SO_2	VOC
Process	20.52	64.44	122.12	3.98	2.57	0.13	0.34
Ancillary	0.49	0.49	0.49	4.42	7.65	0.94	1.21

These emissions rates qualify the facility as a Nevada Class II source as defined under Nevada air quality regulations. The air quality impact analyses and their results are discussed under Ambient Air Quality Impacts.

Area Source Emissions

Operation at the mine site for the Proposed Action involves area source emissions (modeled as two-dimensional releases). These include fugitive emissions from drilling, blasting, loading, unloading, wind erosion, haul roads, and dozing. Also included are tailpipe emissions from equipment and haul road vehicles. Table 4.6-3 shows the potential to emit for these emissions. These emissions constitute the majority of the emissions associated with the project.

Table 4.6-3 Fugitive Area Source Potential to Emit (tons/year)

Source Category	$PM_{2.5}$	PM_{10}	PM	CO	NOx	SO2	VOC
Fugitives	25.82	124.63	357.97	464.24	301.86	5.42	58.38

Commuter and Supply Vehicle Emissions

All passenger and other vehicles accessing the proposed project area emit tailpipe combustion emissions. Total tailpipe emissions for access road and highway travel for the Proposed Action were calculated utilizing the EPA's MOVES model. The model was run assuming 150 vehicles per day would access the project area and assumed that 30 percent would travel from Eureka and 70 percent would travel from Ely. The model also assumed that supplies being shipped to the site would come from Salt Lake City (15%), Reno (50%), Las Vegas (15%) and Ely (5%). These assumptions result in approximately 561,227 miles per year of access road travel and 5,622,071 miles per year of additional highway travel.

Table 4.6-4 summarizes the calculations of total potential emissions for commuting and delivery resulting from the proposed alternative operations.

Table 4.6-4 Access and Highway Vehicle Tailpipe Emissions (tons/year)

Source Category	$PM_{2.5}$	PM_{10}	PM	CO	NOx	SO2	VOC
Highway Vehicle Traffic	0.75	0.75	0.75	15.70	17.35	0.04	1.84
Access Road Vehicle Traffic	0.10	0.10	0.10	1.68	1.57	0.004	0.17

Greenhouse Gas Emissions

Recent scientific evidence suggests there is a direct correlation between global warming and emissions of GHGs. GHGs include carbon dioxide, methane, nitrogen oxide, and ozone. Although many of these gases occur naturally in the atmosphere, man-made sources substantially have increased the emissions of GHGs over the past several decades. Of the man-made GHGs, the greatest contribution currently comes from carbon dioxide emissions.

Climate change analyses are comprised of several factors, including GHGs, land use management practices, and the albedo effect. The tools necessary to quantify incremental climatic impacts of specific activities associated with those factors are presently unavailable. As a consequence, impact assessment of effects of specific anthropogenic activities cannot be performed. Additionally, specific levels of significance have not yet been established. Therefore, climate change analysis for the purpose of this document is limited to accounting and disclosing of factors that contribute to climate change. Qualitative and/or quantitative evaluation of potential contributing factors within the planning area are included where appropriate and practicable.

GHG emissions associated with the proposed project primarily would be associated with the consumption of energy for mining and ore processing over the life of the mine.

The significant operations that would contribute to GHGs emissions would include:

- Fuel consumption (fugitive emissions from vehicles and machinery); and
- Electricity consumption (process emissions related to machinery, milling, heap leach water circulation, dewatering).

Explicit emissions calculations for direct emissions of GHG from on-site sources were completed. The results are included in Table 4.6-5.

Table 4.6-5 Direct Project GH Emissions (tons/year)

Source Category	CO_{2e}
Process	8,628.18
Fugitive	59,393.08

Mercury Emissions

Mercury is a naturally occurring element in many soils, volcanic rocks, and marine and geothermal water sources. It assumes many forms and can be found naturally in the environment as free metallic mercury, chemically combined with other elements in a number of soil or rock types, and in the form of methylmercury in the biosphere. Mercury is generally present in the atmosphere in one of three chemical forms: gaseous elemental mercury, gaseous reactive mercury, or particulate mercury.

Particulate mercury is present naturally in the soils, overburden, and ore at the mine; therefore, it would be present as a small fraction of all particulate emissions produced during the various mine processes. Material handling; primary, secondary, and tertiary crushing; conveying; and stacking are potential emission sources of particulate mercury. Controls would be applied to each of the processes to reduce overall particulate emissions. Mercury emissions from fugitive dust at the mine were estimated using an average weight fraction of 0.0005 percent for ore and 0.0003 percent for waste rock. These values were used to determine total mercury for fugitive dust sources.

Thermal sources of mercury emissions associated with the refining processes in the Proposed Action include the refining furnace, carbon kiln, retort, and electrowinning cells. All refining for the Proposed Action would occur at the refining facilities at the heap leach pad and refinery. Mercury emissions for these sources were assumed to be in compliance with the Nevada MACT for Mercury.

Finally mercury emissions from hydrocarbon combustion were calculated for all on-site sources.

The total mercury emissions for the Proposed Action are summarized in Table 4.6-6.

Table 4.6-6 Proposed Action Mercury Emissions (tons/year)

Source Category	Mercury
Total	5.9E-03
Thermal Units	4.28E-03

Hazardous Air Pollutant Emissions

Toxic air pollutants, also known as HAPs, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. The EPA is working with state, local, and tribal governments to reduce air toxics releases of 187 pollutants to the environment. Examples of toxic air pollutants include benzene, which is found in gasoline; perchloroethylene, which is emitted from some dry cleaning facilities; and methylene chloride, which is used as a solvent and paint stripper by a number of industries. Examples of other listed air toxics include dioxin, asbestos, toluene, and metals such as cadmium, mercury, chromium, and lead compounds.

People exposed to toxic air pollutants at sufficient concentrations and durations may have an increased chance of getting cancer or experiencing other serious health effects. These health effects can include damage to the immune system, as well as neurological, reproductive (e.g., reduced fertility), developmental, respiratory and other health problems. In addition to exposure from breathing air toxics, some toxic air pollutants such as mercury can deposit onto soils or surface waters, where they are taken up by plants and ingested by animals and are eventually magnified up through the food chain. Like humans, animals may experience health problems if exposed to sufficient quantities of air toxics over time.

Sources of HAPs for the proposed action include hydrocarbon combustion, the refining process, constituents found in fugitive dust from ore and waste rock and process chemicals used on-site.

Emissions of HAPs for the proposed action were calculated using AP-42 emissions factors as well as proposed maximum process rates for the facility. The total HAPs emissions for the facility are summarized in Table 4.6-7.

Table 4.6-7 Proposed Action HAPs Emissions (tons/year)

Pollutant	Emissions
1,3-Butadiene	2.60E-03
Acetaldehyde	5.90E-02
Acrolein	8.50E-03
Benzene	2.90E-01
Dichlorobenzene	7.20E-05
Formaldehyde	1.10E-01
Hexane	1.10E-01
Naphthalene	4.40E-02
Toluene	1.10E-01
POM	5.30E-06
Xylene	7.60E-02
Antimony	6.10E-03
Arsenic	1.60E-01
Beryllium	1.00E-02
Cadmium	8.90E-04
Chromium	5.30E-03
Cobalt	2.80E-03
Lead	1.20E-02
Manganese	1.50E-01
Mercury	5.90E-03
Nickel	1.20E-02
Phosphorus	1.70E-01
Selenium	1.40E-06
Hydrochloric Acid	1.30E-01
Cyanide Compounds	8.50E-02
Hydrogen Cyanide	2.04
Total HAPs	**3.61**

4.6.2 Ambient Air Quality Impacts

Dispersion modeling was conducted for the five non-photoreactive criteria air pollutants ($PM_{2.5}$, PM_{10}, carbon monoxide, nitrogen oxide, and sulfur dioxide) proposed to be emitted from the project. The EPA-approved model AERMOD was applied consistent with NDEP and EPA guidance to assess dispersion of those pollutants and potential impacts beyond the activity areas in the Proposed Action. Impacts were predicted at model receptors out to a distance of five kilometers from the project area and 0.6 kilometers from the access road corridor.

Model impacts were assessed for each averaging period for which a NAAQS exists; sources were modeled under a scenario consistent with maximum operations under the Proposed Action.

Ozone formation due to atmospheric transformation of project emissions is expected to be minimal because emissions are below the PSD major source thresholds. In order to assess ambient Ozone impacts, a photochemical model must be used and regional emissions of precursor chemicals must be incorporated. This was not feasible for the EIS and as a result, Ozone impacts are not included in the criteria impact analysis. For all other criteria pollutants, impacts were assessed for each NAAQS averaging period and were then compared to the appropriate ambient standard. For NAAQS comparison, the modeled impact value was added to a background concentration provided by NDEP to determine total impacts. The modeled impacts followed the design form for all criteria pollutants. For those pollutants for which no current NAAQS exists, modeling was not completed.

Table 4.6-8 Model-Predicted Maximum Impacts of Proposed Action

Pollutant	Averaging Period	Class II Increment ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	NEVADA AAQS ($\mu g/m^3$)	Modeled Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)
Nitrogen Oxide	Annual	25	100	100	7.2	0	7.2
	1-hr	NA	188	NS	164.2	0	164.2
Sulfur Dioxide	Annual	20	NA	80	NM	0	NM
	24-hr	91	NA	365	NM	0	NM
	3-hr	512	1300	1300	10.8	0	10.8
	1-hr	NA	196	NS	14.2	0	14.2
Carbon Monoxide	8-hr	NA	10,500	10,500[1]	262.5	0	262.5
	1-hr	NA	40,500	40,500	1,119	0	1,119
PM_{10}	Annual	17	NA	50	NM	NM	NM
	24-Hr	30	150	150	40.9	10.2	51.1
$PM_{2.5}$	Annual	4	35	NA	1.1	2.4	3.5
	24-Hr	9	15	NA	12.3	7	19.3
Lead	Quarterly	NA	1.5	1.5	NM	NM	NM
Ozone	8-hr	NA	146.9	NS	NM	NM	NM
	1-hr	NA	NA	235[2]	NM	NM	NM

NM = Not Modeled
NA = Not Applicable

With the exception of 24-hr PM_{10} and $PM_{2.5}$, all modeled pollutants were below the EPA Class II Increment. This would indicate a minor impact on air quality resources for those pollutants. For 24-hr $PM_{2.5}$ and PM_{10}, the impacts modeled remain well below the NAAQS so their impacts would indicate limited, moderate effects. It should be noted that modeling was not completed for all averaging periods for which Nevada Air Quality Standards and EPA Class II increments exist. This is due to the recent changes to the NAAQS and the resulting averaging period discrepancies between the NAAQS and the other threshold standards. However, based on the current dispersion modeling results, the Proposed Action would result in long-term minor to moderate air resource impacts. These impacts would be limited to the immediate region surrounding the project area and would not produce long range impacts.

4.6.3 Waste Rock Disposal Site Design Alternative

This alternative would introduce a second WRDA to the east of the north pit. This WDRA would accept a portion of the waste rock that would otherwise be placed in the North WRDA identified under the Proposed Action. The impact on air quality emissions would decrease slightly due to the 79 acre decrease in size of the combined facilities and due to shorter haul lengths with less fugitive emissions from hauling. Explicit emissions for this alternative were not developed as part of the Air Quality Impact Analysis, nor was this alternative modeled as part of the ambient modeling analysis. As a result, defining the quantitative impacts associated with this alternative is not currently possible.

4.6.4 Southwest Power Line Alternative

Under this alternative, there would be a temporary increase in the acreage of disturbance in association with the construction of the southwest power line. Coincidentally, construction phase air quality emissions are likely to increase with this alternative.

These impacts would only occur during the construction phase and would not occur throughout the mine life. The maximum project emission and impact year is unlikely to be coincident with the powerline construction period. As a result, the maximum impact year modeling that was completed is likely to remain conservative for the project impacts even under this alternative.

4.6.5 No Action Alternative

This alternative would not result in any increase in ambient pollutant emissions and would therefore provide no impact on air resources beyond the current baseline conditions.

4.7 Vegetation, Including Noxious and Non-Native, Invasive Weeds and Special Status Plants

4.7.1 Indicators

Indicators for vegetation resources focus on acreage of vegetation community disturbance. For general vegetation resources and noxious and non-native, invasive weeds, indicators focus on the acreage of disturbed areas and the proximity of existing weeds to the disturbance areas. For special status plant species, indicators focus on the acreage of disturbance of potential habitat,

as well as the potential for individual take of special status plants. The following factors were considered in determining effects on vegetation resources, including communities, noxious and non-native, invasive weeds, and special status plant species:

- Magnitude of disturbance or loss;
- Biological importance of the resource;
- Uniqueness or rarity of the resource;
- Federal, state, and/or local protection status of the resource; and
- Susceptibility of the resource to disturbance.

4.7.2 Proposed Action

Construction

Vegetation

Direct impacts of the Proposed Action to vegetation include the removal of approximately 2,752 acres of vegetation and 452 acres of permanent unreclaimed vegetation within the fenced portion of the project area totaling approximately 3,204 acres. Loss of vegetation would result from the construction of new roads (i.e., widening and maintaining of the existing access road, new mine site roads, and improvement of existing roads), pit excavations, WRDAs, heap leach facility construction, process facilities and ponds, growth medium stockpiles, and construction of shop facilities and yards. Table 4.7-1 shows the estimated long-term and permanent disturbance acreage within each vegetation community type (Section 3.7; Figure 3.7-1).

Table 4.7-1 Proposed Action Disturbance by Vegetation Community Type

Vegetation Community Type	Area within POO Boundary (acres)	Proposed Action Long-Term (acres)	Proposed Action Permanent (unreclaimed acres)
Sagebrush	8,523	2,204	229
Intermountain Cold Desert Scrub	74	25	2
Lower Montane Woodland	4,762	495	221
Intermountain Cliff and Canyon	29	0	0
Other	66	28	<1
Total	**13,454**	**2,752**	**452**

Indirect impacts to vegetation would include the increased potential for noxious and non-native, invasive weed establishment. Other indirect impacts include the short-term loss of forage for wildlife, wild horses, and livestock, and a potential increase of the erosion potential to soils. These indirect impacts to other resources are discussed further in the appropriate sections of this EIS.

Effects to these vegetation communities would be long-term but minor, as they are typical of the Great Basin high desert and are common and widespread throughout the project area and areas adjacent to the project.

Noxious and Non-Native, Invasive Weeds

Impacts to vegetative resources from noxious and non-native, invasive weeds would include a potential for the establishment of weeds resulting from disturbance and the removal of approximately 3,204 acres of native vegetation and the introduction/spreading of weeds during construction. Indirect impacts resulting from the establishment of noxious and non-native, invasive weeds includes a potential decrease in native plant communities with the increase in competition from weeds. The impacts resulting from the establishment of noxious and non-native, invasive weeds are expected to be long-term and minor with implementation of the EPMs outlined in Section 2.3.14.

Special Status Plants

Direct and indirect impacts of the project on special status plant species would occur as special status species and habitat for special status species were identified within the project area (Figure 3.7-2). Habitat for sand cholla would be removed as a result of the construction of the power line and main access road leading to the project area. Un-reclaimed impacts (i.e., access road and power line footprints) would be long-term and minor, as the habitat occurs mainly to the west of the proposed access road. Two individual sand cholla plants were documented within the access road corridor that would be removed as a result of the project. Section 4.7.2.1 identifies mitigation measures that would be taken to implement removal. Potential for additional impacts from exploration within sand cholla habitat would be reduced by implementing surveys for these species prior to disturbance activities.

Operations, Maintenance, and Reclamation

Vegetation

Operation and maintenance activities for the Proposed Action would cause long-term, negligible impacts to vegetation resources as a result of active mining operations, continued access for repairs and maintenance, and long-term monitoring of reclaimed areas.

Once mining is completed, reclamation activities would include the seeding of 2,752 acres of disturbed area with appropriate BLM-approved seed mixes (Table 2.3-7). The seed mix would include both native and non-native species that have been successfully used in reclaiming disturbed areas in the past. Vegetation would consist mostly of grasses in the short-term. Native shrubs, as well as pinyon pine and juniper, would increase with time but could take many years to establish.

Vegetation impacts from non-reclaimed areas (452 acres) would be long-term and minor as the vegetation community types (229 acres of sagebrush, two acres of intermountain cold desert scrub, and 221 acres of lower montane woodland) are common and widespread throughout the area.

The reclamation plan (Section 2.3.13) is designed to return disturbed areas to shrub and grassland conditions that are similar to the existing dominant vegetation community structure of sagebrush shrubland and steppe with lesser amounts of cold desert scrub and pinyon-juniper woodland. The primary revegetation effort would emphasize re-establishment of the native species.

Noxious and Non-Native, Invasive Weeds

Impacts to vegetative resources from noxious and non-native, invasive weeds would include a potential for the establishment of weeds resulting from continued disturbance and the removal of native vegetation and the introduction/spreading of weeds during operations, maintenance, and reclamation. Indirect impacts resulting from the establishment of noxious and non-native, invasive weeds includes a potential decrease in native plant communities with the increase in competition from weeds. The impacts resulting from the establishment of noxious and non-native, invasive weeds during operations, maintenance, and reclamation are expected to be long-term and minor with implementation of the EPMs outlined in Section 2.3.14.

Special Status Plants

Direct and indirect impacts of the project on special status plant species would occur as special status species and habitat for special status species was identified within the project area. Habitat for sand cholla would be removed as a result of the construction of the power line and main access road leading to the project area and potentially due to exploration drilling. Permanent impacts (i.e., access road and power line footprints) would be long-term and minor, as the habitat occurs mainly to the west of the proposed access road. The two individual sand cholla plants removed as a result of the project would be a long-term, minor impact to that special status species.

4.7.2.1 Mitigation

Vegetation

The EPMs provided in Section 2.3.14 aim to assist in the successful reclamation of disturbed areas following reclamation and closure.

Noxious and Non-Native, Invasive Weeds

The EPMs provided in Section 2.3.14 aim to reduce the spread and establishment of weeds during the project and following reclamation and closure.

Special Status Plants

Pre-disturbance surveys would be completed within sand cholla habitat prior to exploration disturbance in order to reduce potential impacts to this species. A cactus and yucca salvage plan following the Nevada Revised Statute 527.060 - .120 ("Protection of Christmas Trees, Cacti and Yucca") and the associated regulations NAC Chapter 527 would be implemented).

4.7.2.2 Unavoidable Adverse Impacts on Vegetation Resources

Vegetation

There would be unavoidable adverse impacts to vegetation due to long-term disturbance of existing vegetation communities (Table 4.7-1). Long-term disturbance would create conditions favorable to erosion and the establishment of noxious weeds and other invasive, non-native species.

Noxious and Non-Native, Invasive Weeds

Disturbance activities during the life of the project would create conditions favorable to the establishment of noxious and non-native, invasive weeds.

Special Status Plants

There would be unavoidable adverse impacts to special status plant species due to long-term disturbance of existing sand cholla habitat and individual plants that occur near and within the proposed access road. Long-term disturbance would create conditions favorable to the establishment of noxious weeds which could create unfavorable habitat conditions for sand cholla in nearby, undisturbed habitat.

4.7.2.3 Irreversible and Irretrievable Commitments of Resources

Vegetation

There would be an irretrievable commitment of vegetation resources during the life of the project; vegetation resources would return to reclaimed areas. Long-term disturbance from the mine facilities not subject to reclamation would constitute an irreversible commitment of those vegetation resources.

Noxious and Non-Native, Invasive Weeds

There are vegetative resources that would be reclaimed following closure of the project. However, disturbance activities during the life of the project would create conditions favorable to the establishment of noxious and non-native, invasive weeds.

Special Status Plants

There would be an irreversible commitment of resources with the removal of two sand cholla plants along the access road, however with the implementation of mitigation measures (Section 4.7.2.1) that would be taken to implement removal.

4.7.2.4 Relationship of Short-Term Uses and Long-Term Productivity

Vegetation

Disturbance and loss of vegetation resources until reclaimed would be considered long-term for the majority of the Proposed Action. Impacts to vegetation resources would initially result from construction activities; however, the long-term loss of vegetation associated with mining operations and later the non-reclaimed elements of the Proposed Action would impact the long-term productivity of vegetation and the associated wildlife that would be displaced. Reclamation of disturbed areas would result in the conversion of the pinyon-juniper woodland community to

grassland and shrub community types. Productivity could be reduced as a result of noxious weed establishment in previously-disturbed or reclaimed areas.

Noxious and Non-Native, Invasive Weeds
Long-term disturbance and loss of native vegetation would result from construction and mining activities; however, establishment and spread of weeds resulting from the Proposed Action may result in a loss of long-term productivity of vegetation.

Special Status Plants
Long-term disturbance and loss of sand cholla habitat would result from construction of the proposed access road. Disturbance and later reclamation of the proposed access road would result in the disturbance of soils previously habitable to sand cholla plants and would therefore replace habitat with non-habitat.

4.7.3 Waste Rock Disposal Site Design Alternative

The Waste Rock Disposal Site Design Alternative would result in the same types of impacts as described under the Proposed Action except would result in approximately 79 fewer acres of disturbance to vegetation (Section 2.4.1).

Table 4.7-2 Proposed Action Disturbance by Vegetation Community Type

Vegetation Community Type	Area within POO Boundary (acres)	Proposed Action Long-Term (acres)	Waste Rock Disposal Site Design Alternative Permanent (unreclaimed acres)
Sagebrush	8,523	2,204	241
Intermountain Cold Desert Scrub	74	25	2
Lower Montane Woodland	4,762	495	158
Intermountain Cliff and Canyon	29	0	0
Other	66	28	<1
Total	**13,454**	**2,752**	**401**

Noxious and Non-Native Invasive Weeds
Impacts from noxious weeds with the Waste Rock Disposal Site Design Alternative would be the same as with the Proposed Action.

Special Status Plants
Direct and indirect impacts of this alternative to special status plant species would be the same as the Proposed Action.

4.7.3.1 Unavoidable Adverse Impacts on Vegetation Resources

Vegetation
Unavoidable adverse impacts on vegetation would be the same as for the Proposed Action.

Noxious and Non-Native, Invasive Weeds
Unavoidable adverse impacts on vegetation resources from the spread and establishment of noxious and non-native, invasive weeds would be the same as for the Proposed Action.

Special Status Plants
Unavoidable adverse impacts on special status plants would be the same as for the Proposed Action.

4.7.3.2 Irreversible and Irretrievable Commitments of Resources

Vegetation
Irreversible and irretrievable commitments of resources for vegetation would be the same as for the Proposed Action.

Noxious and Non-Native, Invasive Weeds
Irreversible and irretrievable commitments of resources for vegetation from the spread and/or establishment of noxious and non-native, invasive weeds would be the same as for the Proposed Action.

Special Status Plants
Irreversible and irretrievable commitments of resources for special status plants would be the same as for the Proposed Action.

4.7.3.3 Relationship of Short-Term Uses and Long-Term Productivity

Vegetation
Short-term uses and long-term productivity for vegetation would be the same as for the Proposed Action.

Noxious and Non-Native, Invasive Weeds
Short-term uses and long-term productivity for vegetation from the spread and/or establishment of noxious and non-native, invasive weeds would be the same as for the Proposed Action.

Special Status Plants
Short-term uses and long-term productivity for special status plants would be the same as for the Proposed Action.

4.7.4 Southwest Power Line Alternative

Vegetation
The Southwest Power Line Alternative would result in the same types of impacts to vegetation resources as described under the Proposed Action except the 16 acres accounted for in Table 2.3-1 for the Proposed Action power line would be replaced by 68 acres of additional disturbance associated with construction of the power line and its associated maintenance road (Figure 3.7-3). Table 4.7-3 shows the estimated disturbance acreage within each vegetation community type associated with the Southwest Power Line Alternative. Impacts would be long-

term and minor as the vegetation community types are common and widespread throughout the area.

Table 4.7-3 Southwest Power Line Disturbance by Vegetation Community Type

Vegetation Community Type	Southwest Power Line Alternative (acres)
Sagebrush	41
Intermountain Cold Desert Scrub	23
Lower Montane Woodland	4
Other	<1
Total	**68**

Noxious and Non-native, Invasive Weeds

Impacts to noxious and non-native, invasive weeds would result in the same type of impacts as under the Proposed Action with an additional 68 acres of disturbance and would include a potential for the establishment of weeds resulting from disturbance and the removal of native vegetation and the introduction/spreading of weeds during construction of the power line. Indirect impacts resulting from the establishment of noxious and non-native, invasive weeds includes a potential decrease in native plant communities with the increase in competition from weeds. The impacts resulting from the establishment of noxious and non-native, invasive weeds are expected to be long-term and minor with implementation of the EPMs outlined in Section 2.3.14.

Special Status Species

Direct and Indirect impacts of the project on special status plant species would occur as special status species and habitat for special status species were identified within the 60-foot power line ROW and project area. Habitat for sand cholla would potentially be removed as a result of the construction of the power line leading to the project. However, the design and alignment of the power line would avoid impacts to sand cholla where practicable. Once it is determined how many sand cholla would potentially be impacted, coordination with the Nevada Division of Forestry would occur to determine the proper course of action. Special status species impacts (i.e., power line footprint) would be long-term and minor, as habitat occurs in areas adjacent to the power line ROW. A total of 16 individual sand cholla plants were documented within the 60-foot ROW and two individual cholla plants associated with the Proposed Action that may be impacted during construction of the power line (Figure 3.7-4). A total of 104 sand cholla plants were found during a survey that was conducted on a 200-foot buffer of the Southwest Power Line Alternative. The loss of 16 individual plants would result in a decrease of 15 percent of the local population. Assuming that there are more plants outside of the 200-foot buffer, there would be a decrease in less than 15 percent of the local population, which would result in a minor impact.

4.7.4.1 Unavoidable Adverse Impacts on Vegetation Resources

Vegetation

There would be unavoidable adverse impacts to vegetation due to disturbance of existing vegetation communities along the ROW and project area (Table 4.7-2). Disturbance would create conditions favorable to the establishment of noxious weeds and other invasive, non-native species.

Noxious and Non-Native, Invasive Weeds

Unavoidable adverse impacts on vegetation resources from the spread and establishment of noxious and non-native, invasive weeds would be the same as for the Proposed Action.

Special Status Plants

Unavoidable adverse impacts on special status plants would be the same as for the Proposed Action.

4.7.4.2 Irreversible and Irretrievable Commitments of Resources

Vegetation

Irreversible and irretrievable commitments of resources for vegetation would be the same as for the Proposed Action.

Noxious and Non-Native, Invasive Weeds

Irreversible and irretrievable commitments of resources for vegetation from the spread and/or establishment of noxious and non-native, invasive weeds would be the same as for the Proposed Action.

Special Status Plants

Disturbance activities during construction and maintenance of the power line and proposed operation would change habitat and soils, which sand cholla currently occupy; this would be an irreversible commitment of that habitat.

4.7.4.3 Relationship of Short-Term Uses and Long-Term Productivity

Vegetation

Short-term uses and long-term productivity for vegetation would be the same as for the Proposed Action.

Noxious and Non-Native, Invasive Weeds

Disturbance and loss of native vegetation would result from construction and maintenance activities and would be long-term in duration; however establishment and spread of weeds resulting from the Southwest Power Line Alternative may result in a loss of long-term productivity of vegetation.

Special Status Plants

Long-term impacts to special status plant species within the ROW would include the potential removal of existing plants along the power line and maintenance road. Long-term effects would

result from disturbance of sand cholla habitat and loss of genetic diversity to the population that occurs in proximity to the project.

4.7.5 No Action Alternative

Impacts resulting from this alternative would consist of the removal of vegetation for previously permitted activities within the project area. Table 4.7-4 shows the estimated disturbance acreage within each vegetation community type associated with the No Action Alternative.

Table 4.7-4 No Action Alternative Disturbance by Vegetation Community Type

Vegetation Community Type	No Action Alternative (acres)
Sagebrush	54
Intermountain Cold Desert Scrub	6
Lower Montane Woodland	35
Intermountain Cliff and Canyon	3
Other	2
Total	**100**

Impacts resulting from the No Action Alternative would consist of the removal of 100 acres of vegetation for previously permitted activities within the project area. Reclamation of disturbed areas would result in the conversion of the pinyon-juniper woodland community to grassland and shrub community types. Impacts to special status plant species under this alternative would not occur since no special status species or habitat were documented in previously permitted disturbance areas. Impacts from noxious weeds under this alternative would include clearing vegetation only in previously permitted areas, thus creating the potential for establishment of noxious weeds and other invasive species.

Under the No Action Alternative, approximately 2,880 acres of disturbance to vegetation associated with the project would not occur. Impacts from the No Action Alternative would be short-term and negligible as the vegetation community types are common and widespread throughout the area and reclamation would occur shortly after completion of exploration.

4.8 Wildlife Resources, Including Special Status Wildlife, and Migratory Birds

4.8.1 Indicators

The construction and operation of the project may have direct and indirect impacts to wildlife through disturbance and/or habitat fragmentation. This may impact game species and wildlife populations and indirectly affect recreational activities such as but not limited to hunting and wildlife viewing.

The following indicators were considered when analyzing potential impacts to wildlife resources and special status species:

- Acres of disturbance and the proximity of the project area to high value habitat locations such as raptor nests and greater sage-grouse breeding, nesting, and brood rearing habitat;

- Location of access roads and transmission lines in relation to high value habitat such as greater sage-grouse breeding, nesting, and brood rearing habitat;

- Number of transmission line poles with line-of-sight view from greater sage-grouse leks;

- Ambient noise levels from vehicular traffic and proposed operations in relation to greater sage-grouse breeding, nesting, and brood rearing habitat; and

- Acres of different wildlife habitats (vegetation community types) physically disturbed and the juxtaposition of that habitat over the life of the project.

4.8.2 Proposed Action

The categories of wildlife described below inhabit and/or forage within the project area. Impacts to these species would be similar for all of the project features regardless of the specific element with the exception of the proposed transmission lines and access road. Impacts to wildlife from these two elements would be discussed under their specific project feature.

Direct, long-term, and some permanent, impacts to wildlife habitat would occur due to mine facilities, access road, and transmission line construction. Table 4.7-1 shows the approximate Proposed Action acres of permanent disturbance impacts to vegetative communities that are interrelated with wildlife habitat. Impacts would occur to areas that would be reclaimed and these impacts would likely be long-term and minor, as the vegetative communities/wildlife habitat present within each of the project elements are common and widespread throughout the area.

Construction

The facilities associated with the Proposed Action would disturb four different vegetation communities/wildlife habitats including Sagebrush, Intermountain Cold Desert Scrub, Lower Montane Woodland, and Intermountain Cliff and Canyon. Together, these communities make up the majority of the project area. Further discussion of these vegetation communities/wildlife habitats can be found in Section 3.7.

The North Pan Pit and South Pan Pit are not subject to reclamation (Section 2.3.13); therefore, permanent disturbance to these areas would occur (Figure 2.3-11). Permanent acreage impacts to the four vegetation communities/wildlife habitats within the project area resulting from the Proposed Action are described in Section 4.7. Vegetation and soils would be removed from or compacted in these areas essentially eliminating forage productivity. Long-term disturbance would occur in all other areas within the project area for the life of the project until reclamation occurs.

Most of the wildlife species that inhabit the project area are highly mobile and would likely vacate the construction area and alter movement patterns as construction personnel conduct development activities. Species that are slow moving or that tend to retreat to underground

when approached could be directly affected by construction equipment and excavations for the roads, buildings, transmission lines, facilities and other related infrastructure. In rocky areas, drilling and blasting may be necessary. The increased human activity and noise associated with construction activities would likely cause wildlife to temporarily avoid the area and displace into adjacent, undisturbed suitable habitat causing increased competition for resources. The potential effects of noise depend on the spatial relationship between a noise source and noise-sensitive receptors. Noise-generating activities associated with the Propose Action include earthmoving, equipment operation, blasting and vehicular traffic. Approximately 160 workers, over a one-year period (Section 2.3), are expected for construction activities. Increased vehicular traffic associated with construction activities has potential to cause an increase in wildlife-vehicle collisions.

Federally-Listed, Proposed, and Candidate Species

Greater Sage-Grouse

Three greater sage-grouse leks could potentially be affected by the Proposed Action. These leks include two active and one inactive lek. Table 4.8-1 shows each lek's proximity to the project area.

Table 4.8-1 Greater Sage-Grouse Lek Proximity to Proposed Action

Lek Name	Lek Activity Status	Approximate Distance from Project Feature
East Blackpoint	Active	1.6 miles (8,448 feet) to the west of the proposed transmission line and access road
Southwest Pancake Summit	Active	1.04 miles (5,491 feet) to the east of the proposed transmission line and access road
Northeast Blackpoint	Inactive	2.98 miles (15,734 feet) to the west of the project boundary

Human disturbance associated with construction activities could disturb greater sage-grouse during the breeding season. Vehicle collisions with greater sage-grouse could result from increased activity associated with construction. Higher mortality rates from vehicle collisions during the breeding season could occur from increased sage-grouse activity near leks.

Ambient noise levels could increase at lek locations as a result of the noise sources associated with the Proposed Action. Increased noise levels near leks that repeatedly disturb birds may lead to males and females abandoning lek sites (Lyon and Anderson, 2003). Studies indicate acoustic communication is a vital component in the reproductive behavior of greater sage-grouse. Females use vocalizations to find lek habitats. Upon arrival at the lek, females use male vocalizations to choose a mate (UGRBSGWG, 2007). Because of these findings, it is now suggested that project-related noise impacts on greater sage-grouse be evaluated within three miles of the project boundary (BLM, 2012h). As discussed in Section 3.8.3 noise data specific to the Pan project leks would be collected during the 2013 breeding season. Noise impacts associated with the Proposed Action within three miles of sage-grouse leks are discussed below.

In order to determine the effect of project noise on sensitive lek sites, a determination of baseline noise levels and the propagation potential of project related noise sources was undertaken. As discussed in Section 3.8.3, noise data specific to the Pan project leks will be collected during the 2013 breeding season. As a result, an estimated ambient baseline ranging from 16.4 to 23 dBA, as provided by NDOW, was used for the assessment of noise impacts. In order to determine the potential for noise propagation, an acoustic model was used. Once output values were determined, they were compared to a sound threshold. The impact threshold currently being used is 10 dB(A) above the ambient baseline level. As a result, all impacts were assessed against a threshold ranging from a minimum of 26.4 dB(A) to a maximum of 33 dB(A).

The Federal Highway Administration, Roadway Construction Noise Model, a national model based on noise calculations and extensive construction noise data, was the selected model for use in this analysis. The model requires that the user input receptor data, including background dBA levels, and the type of land use and equipment/noise source data, including distances from the noise source to the receptor and estimates for shielding from natural or anthropogenic barriers. The model then calculates the sound pressure level for each piece of equipment at the defined receptor locations. This calculation is based on atmospheric divergence and the effect of sound shielding due to topographic features. A conservative value of 4.8dB was used to simulate the effect of average topographic shielding effect. The model then utilized a usage factor for each piece of equipment to determine the combined sound impact on the defined receptor. This combined Leq (equivalent consistent sound level) impact level was then reported. This impact was then compared to the preliminary noise threshold ranging from 26.4 to 33 dB(A).

The receptors used in the modeling analysis are identified by the names of the leks in closest proximity to the noise source (Figure 4.8-1). Three separate modeling runs were conducted in order to separately assess the maximum impacts from open-pit mining activities (including blasting, mining and hauling), access road construction, and access road traffic. All of the different activities/sources could impact each lek in varying degrees, but for the purpose of this analysis, the lek (receptor) nearest to the noise source was chosen, since this value would represent the maximum potential impact from each individual activity.

Model input information and the maximum impact results, based on the particular activity are presented as follows:

Road construction activities would occur in closest proximity to the Pancake Summit Lek; the shortest distance being 4,904 feet from the proposed access road to the receptor. The equipment identified in the construction phase would include a backhoe, dozer, dump truck, grader, roller, scraper, and water truck. The model calculated Leq for all equipment at the receptor was 40.8 dB(A). Although the modeled results seem to show that the maximum noise impacts possible at the nearest lek would exceed the preliminary maximum noise threshold value, once final baseline is reviewed, additional analyses will be conducted.

The open-pit mining activities noise model incorporated a haul truck, blasting, drill rig truck, excavator and water truck in order to assess impacts on the nearest lek. The drill rig truck, excavator and blasting sources were assumed to solely resonate noise from inside the pits where the water and haul trucks were utilized both in and out of the pits. The North Pit is in closest proximity to the East Blackpoint lek, at approximately 18,090 feet. The haul road, which would be utilized by both the haul and water trucks, is in closest proximity to the East Blackpoint lek at a distance of approximately 13,695 feet. The model calculated Leq for all equipment at the receptor was 25.3 dB(A). The results show that the maximum noise impacts possible at the nearest lek are below the preliminary minimum noise threshold.

Access road travel activities would occur in closest proximity to the Pancake Summit Lek; the shortest distance being approximately 4,904 feet from the proposed access road to the receptor. The equipment identified in access road travel would include pickup and flat bed trucks. The model calculated Leq (equivalent consistent sound level) for all equipment at the receptor was 29.0 dB(A). The results show that the maximum noise impacts possible at the nearest lek are within the preliminary threshold range (Table 4.8–2).

BLM Sensitive and State of Nevada Protected Species

Pygmy Rabbit

Suitable pygmy rabbit habitat has been identified though no known occurrences exist within the project area. The construction of facilities within or near suitable habitat could result in direct sagebrush habitat loss. Power line structures provide raptor perches that facilitate predation, disrupt pygmy rabbit dispersal corridors, and the associated corridors increase human access for recreational activities, all of which impact pygmy rabbits and their habitat. Proposed modified power pole structure designs would assist in attempting to minimize impacts to pygmy rabbits and are discussed further under mitigation Section 4.8.2.1.

Construction would have a short-term negligible impact on pygmy rabbit within and adjacent to the construction area and a minor long-term impact on pygmy rabbit habitat.

Golden Eagle

Suitable nesting habitat and an existing golden eagle nesting territory were identified during biological baseline surveys within a five-mile buffer (Figure 3.8-3). This territory lies approximately 0.32 miles north of the Proposed Action North WRDA and 0.62 miles northwest of the North Pan Pit. Impacts to nesting golden eagles would potentially occur if nesting was attempted or occurred during construction activities. Construction would potentially displace eagles from nests and the surrounding foraging habitat.

The *Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance* (Pagel et al., 2010) states the following:

> "Golden eagle behavior varies among individuals and can be affected by previous experiences. However, some behavioral generalities relative to direct and indirect disturbance include the following:

1. Agitation behavior (displacement, avoidance, and defense),
2. Increased vigilance at nest sites,
3. Change in forage and feeding behavior, and/or
4. Nest site abandonment.

> Of the preceding behaviors, nest site abandonment constitutes take under the Eagle Act, as it is specifically cited in the definition of 'disturb'. The other behaviors, when considered cumulatively, may be evidence that activities are interfering with normal breeding behavior and are likely to lead to take. Human intrusions near golden eagle nest sites have resulted in the abandonment of the nest; high nestling mortality due to overheating, chilling or desiccation when young are left unattended; premature fledging; and ejection of eggs or young from the nest (Boeker and Ray, 1971, Suter and Joness, 1981)."

Furthermore, numerous studies have been conducted and published on the interactions between raptors and transmission lines. Raptor electrocution continues to be one of the major wildlife concerns of state and federal agencies. Collisions with and electrocutions by power lines are common and have been well documented.

Transmission lines and structures have also been known to have a beneficial effect on raptors. Although design features are intended to discourage roosting, perching, and nesting, transmission lines have been known to provide areas that facilitate hunting. While these effects are beneficial for raptors, they are adverse to prey species (including sensitive species like greater sage-grouse and pygmy rabbits).

Habitat fragmentation and displacement associated with construction activities would have short-term minor impacts to golden eagles that would be moderate. Discussion of mitigation measures designed to reduce impacts to golden eagles is discussed under mitigation Section 4.8.2.1. Further, ongoing impacts could occur during operation of the mine and are discussed below under operations, maintenance, and reclamation.

Western Burrowing Owl

Suitable habitat for western burrowing owl is present within the survey area though occurrences have not been documented. Construction activities could potentially destroy suitable and occupied nesting habitat for burrowing owls as well as displace individual owls. Mitigation measures, such as pre-construction clearance surveys and timing restrictions, for this species have been developed and are discussed below. Generally speaking, mitigation measures would be employed prior to, and during construction activities that would greatly reduce the likelihood of burrowing owl nests being destroyed. Impacts to western burrowing owl would be short-term and negligible.

Other Raptors

Special status raptor species are known to utilize the habitat within and adjacent to the project area. Noise and human disturbance associated with the construction of the Proposed Action would have a temporary impact on foraging raptors and would temporarily displace them to

areas outside the active construction zone. EPMs, such as timing restrictions, active nest buffers, and implementation of a Bird and Bat Conservation Strategy (BBCS), would be employed prior to and during construction activities that would greatly reduce the likelihood of raptor nesting behavior being disrupted or nests being destroyed. The BBCS will be presented in the FEIS. The intensity of these impacts would vary by species but impacts resulting from construction activities would be short-term and are not expected to exceed the negligible level.

Migratory Birds

Many species of migratory bird species are known to utilize the habitat within and adjacent to the project area. Noise and human disturbance associated with the construction of the project would have a temporary impact on migratory birds and would temporarily displace them to areas outside the active construction zone. EPMs, such as timing restrictions, active nest buffers, and implementation of an BBCS, would be employed prior to and during construction activities that would greatly reduce the likelihood of migratory bird nesting behavior being disrupted or nests being destroyed. The intensity of these impacts would vary by species. Impacts to migratory birds would be short-term and negligible.

Bats

Several special status bat species have suitable foraging and roosting habitat throughout the project area though no known hibernacula habitat is present. Construction activities, especially blasting, could disturb some of these areas. Bats most likely use the project area for foraging. Implementation of a BBCS would help to reduce impacts to bats. Construction activities could cause bats to temporarily abandon foraging habitat within active work zones. Impacts to bats from construction activities would be short-term and negligible.

Dark Kangaroo Mouse

Suitable habitat for dark kangaroo mouse is present within the survey area though no known occurrences have been documented. Construction activities could destroy suitable and occupied nesting habitat as well as displace individual kangaroo mice. Mitigation measures for this species have been developed and are discussed below. Generally speaking, mitigation measures would be employed prior to, and during construction activities that would greatly reduce the likelihood of dark kangaroo mouse habitat and individual mice being destroyed. Impacts to dark kangaroo mouse would be short-term and negligible.

General Wildlife

Small Mammals, Predatory Mammals, and Reptiles

Common small mammals (i.e., cottontail, jackrabbit, and ground squirrel), common predators (i.e., coyote, fox, and badger), and common reptiles (i.e., western fence lizard and sagebrush lizard) known to occur throughout the project area could be displaced into adjacent undisturbed habitat during construction activities. However, some smaller and less mobile wildlife species could potentially be killed or injured during construction activities. Impacts to these species from construction activities would be short-term and minor.

Mule Deer

Occupied mule deer habitat is present throughout the project area although this habitat is of low to moderate value and mule deer are found in low densities within and adjacent to the project area. This habitat has low to moderate value because it doesn't represent significant wintering grounds and has little use by mule deer. Noise and increased human activity in the project area would likely displace mule deer to adjacent habitat during construction associated with the Proposed Action. Impacts to mule deer resulting from the construction activities would be short-term and negligible.

Pronghorn Antelope

Occupied pronghorn antelope habitat is present throughout and adjacent to the project area. Noise and increased human activity in the project area would likely displace pronghorn antelope to adjacent habitat during construction associated with the Proposed Action. Impacts to pronghorn antelope resulting from the construction activities would be short-term and negligible.

Operations, Maintenance, and Reclamation

Wildlife could be periodically disturbed by vehicular traffic, road maintenance, transmission line routine maintenance, and blasting. Wildlife habitat would be permanently altered at the North Pan Pit and South Pan Pit. Long-term vegetation community/wildlife habitat impacts would occur at the remaining facilities during construction and operations, reclamation, and post-mining. Noise associated with operations, maintenance and reclamation could have adverse effects on wildlife populations. Because of significant human activity, specifically increased noise levels, occurring during mining, impacts to wildlife are anticipated to be moderate.

Federally-Listed, Proposed, and Candidate Species

Greater Sage-Grouse

As stated above construction impacts to two active greater sage-grouse leks by anthropogenic noise sources could potentially occur as a result of the Proposed Action. Other human activities could have adverse effects on greater sage-grouse, for example, males and females may abandon leks if repeatedly disturbed by raptors perching on power lines near leks (Ellis, 1984), by vehicle traffic on nearby roads (Lyon and Anderson, 2003), or by noise and human activity during the breeding season (Braun et al., 2002; Holloran, 2005; Kaiser, 2006). Higher mortality rates from vehicle collisions during the breeding season could occur from increased greater sage-grouse activity near leks. Collisions with nearby power lines and vehicles and increased predation by raptors may also increase mortality of birds at leks (Connelly et al., 2000a and 2000b).

Power lines can provide hunting perches for raptors in treeless areas. Greater sage-grouse may also be injured or killed by flying into these structures. Power lines most likely impact greater sage-grouse near leks, in brood-rearing habitat, and in wintering areas that also support large numbers of wintering raptors. Construction of new power lines contributes to habitat degradation when accompanied by new roads or other infrastructure, e.g., pipelines, fences, etc. (Kobriger and McCarthy, 2005). Studies in California identified three factors associated with power lines that could decrease greater sage-grouse numbers or lek use, either singly or in combination: 1) raptors, especially immature golden eagles, hunt more efficiently from perches such as

transmission line structures and may harass or take adult greater sage-grouse near or on leks; 2) common ravens (*Corvus corax*) may use the structures as perches and nest sites, and prey on eggs and young of greater sage-grouse near leks; and 3) greater sage-grouse may respond to structures as potential raptor perch sites and thus abandon, or decrease their use of, a lek from which structures can be seen (Rowland, 2004). Consequently, they may respond to the power line poles along the access road as potential raptor perch sites and decrease their use in all areas from which the power line can be seen.

Existing and refined impacted greater sage-grouse habitat acreages associated with the Proposed Action are shown Table 4.8-2. This includes the fenced area within the project area, the access road, as well as those areas within 600 meters of the proposed transmission line (Figure 4.8-1).

Table 4.8-2 Proposed Action Greater Sage-Grouse Impacted Habitat

	PPH (acres)	PGH (acres)		PGH Net Difference (acres)
		Existing Mapping	Refined Mapping	
Impacted Habitat Associated with Proposed Action	2,652	1,873	1,705	168

Roads and off-road travel can impact sage-grouse and their habitats in a variety of ways that include habitat fragmentation and loss and a potential decline and/or shift in grouse populations (MSGWG, 2005). Further, male and female sage-grouse may abandon leks if repeatedly disturbed by vehicle traffic on nearby roads (Lyon and Anderson, 2003). As such, the new access road alignment was specifically selected to avoid line-of-sight view and noise impacts from the road to the two leks. In addition, natural topography blocks view of the majority of the mine site area from the leks. The impacts to greater sage-grouse from operations, maintenance, and reclamation are expected to be similar in intensity as the impacts described above under construction; however, the duration of impacts would be long-term and moderate.

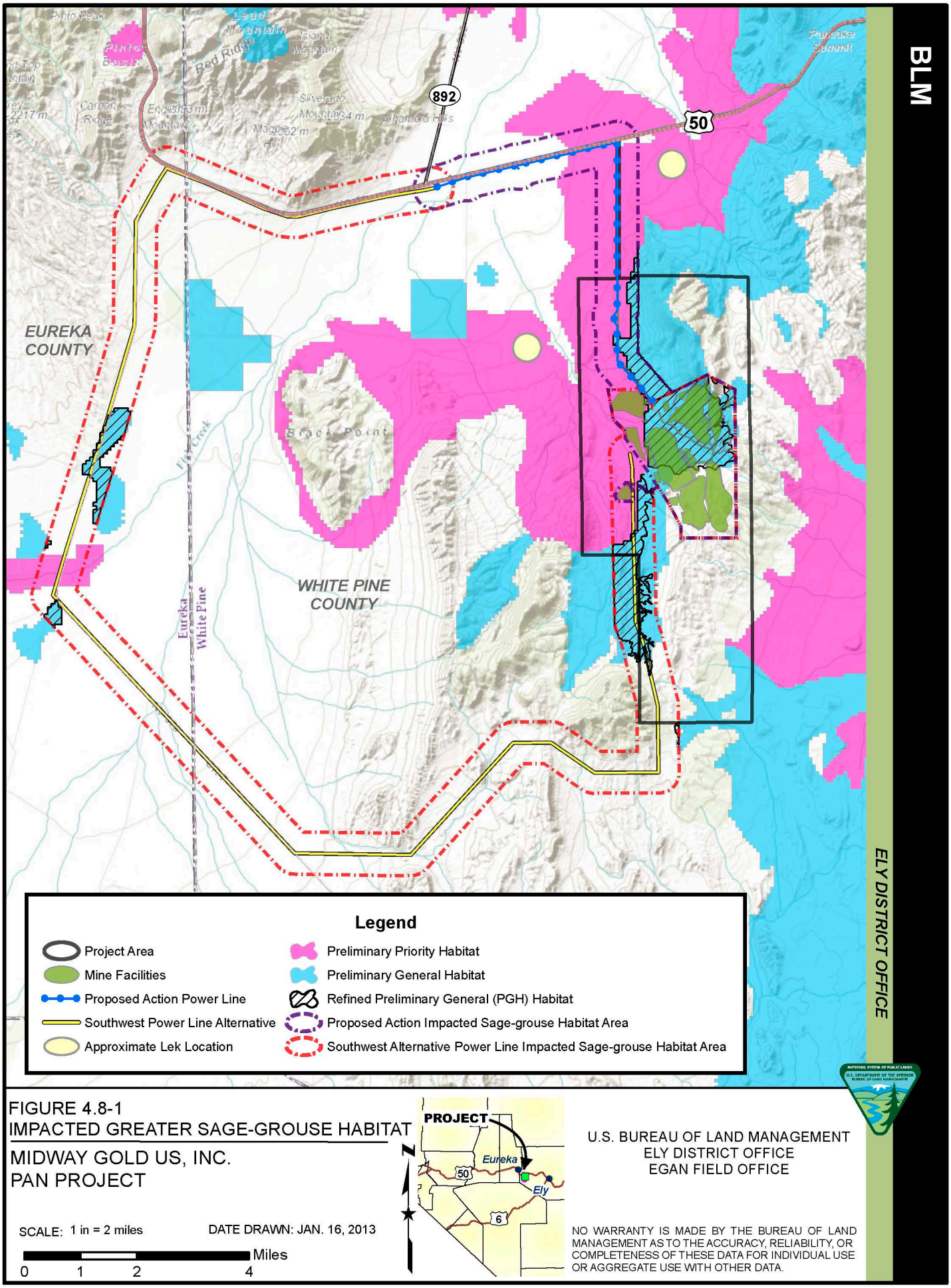


FIGURE 4.8-1
IMPACTED GREATER SAGE-GROUSE HABITAT

MIDWAY GOLD US, INC.
PAN PROJECT

SCALE: 1 in = 2 miles

DATE DRAWN: JAN. 16, 2013

0 1 2 4 Miles

U.S. BUREAU OF LAND MANAGEMENT
ELY DISTRICT OFFICE
EGAN FIELD OFFICE

BLM Sensitive and State of Nevada Protected Species

Pygmy Rabbit

The construction and operation of facilities within or near suitable habitat would result in direct sagebrush habitat loss and transmission lines would provide raptor perches that facilitate predation, disrupt pygmy rabbit dispersal corridors, and increase human access for recreational activities, all of which impact pygmy rabbits and their habitat. Further, displacement could occur if facilities are constructed in occupied habitat. Power line structures can provide hunting and roosting perches and nesting support for many raptor species that can prey upon pygmy rabbits.

Previously conducted surveys did not identify any occupied habitat in the area of the project. However, pre-disturbance clearance surveys for species presence would be performed prior to any destruction of habitat. If occupied habitat were encountered, coordination between NDOW and BLM would occur prior to any surface disturbance in that area. Proposed modified structure designs would assist in attempting to minimize hunting and roosting perch opportunities within and near suitable pygmy rabbit habitat. Further, pygmy rabbits are highly mobile and would likely vacate the construction area and would likely change movement patterns and/or vacate as operations continued. As with many other ground dwelling species, pygmy rabbits could be directly affected by construction and operation activities such as destruction of burrows. The operations, maintenance, and reclamation activities associated with the Proposed Action would have a short-term negligible impact on pygmy rabbits and a long-term impact on suitable habitat.

Golden Eagle

Noise and human disturbance associated with operations, maintenance, and reclamation of the Proposed Action would impact foraging golden eagles and displace them to habitat adjacent to the active mining area. Nesting golden eagles could be impacted although the habituation techniques suggested by Romin and Muck (1999), which are outlined under mitigation Section 4.8.3.1, would be implemented. Habitat fragmentation and displacement associated with construction activities would have short-term minor impacts to golden eagles. Further discussion of mitigation measures designed to reduce impacts to golden eagles is discussed under mitigation Section 4.8.2.1.

Western Burrowing Owl

Burrowing owls and their nests have not been identified within the project area. If occupied habitat is present, operations, maintenance, and reclamation activities would have temporary, negligible impacts to burrowing owls by discouraging them from foraging or nesting within the active mining area and by displacing them to adjacent areas with suitable foraging and nesting habitat. Mitigation measures, such as pre-construction clearance surveys and timing restrictions, for this species have been developed and are discussed below. Generally speaking, mitigation measures would be employed prior to, and during construction activities that would greatly reduce the likelihood of burrowing owl nests being destroyed. Impacts to western burrowing owl would be short-term and negligible level.

Other Raptors

Special status raptor species are known to utilize the habitat within and adjacent to the project area. Noise and human disturbance associated with the operations, maintenance, and reclamation of the project would have a temporary impact on foraging raptors and would displace them to areas outside the active mining area. Mitigation measures, such as timing restrictions, active nest buffers, and implementation of an BBCS, would be employed prior to and during operations that would greatly reduce the likelihood of raptor nesting behavior being disrupted or nests being destroyed. The intensity of these impacts would vary from species to species but impacts resulting from operations, maintenance, and reclamation would be short-term and are not expected to exceed the negligible level.

Migratory Birds

Many species of migratory birds are known to utilize the habitat within and adjacent to the project area. Noise and human disturbance associated with the operations, maintenance, and reclamation of the project would have a temporary impact on migratory birds and would displace them to areas outside the active mining area. Mitigation measures, such as timing restrictions, active nest buffers, and implementation of an BBCS, would be employed prior to and during construction activities that would greatly reduce the likelihood of migratory bird nesting behavior being disrupted or nests being destroyed. The intensity of these impacts would vary by species but impacts resulting from operations, maintenance, and reclamation would be short-term and are not expected to exceed the negligible level.

Bats

Several special status bat species have suitable foraging and roosting habitat throughout the project area though no known hibernacula are present. Foraging bats using the project area could be displaced to adjacent suitable habitat as a result of operations, maintenance, and reclamation. Impacts to bats would be short-term and negligible.

Dark Kangaroo Mouse

Suitable habitat for dark kangaroo mouse is present within the project area though no known occurrences have been documented. Operations, maintenance, and reclamation activities could destroy suitable and occupied nesting habitat as well as displace individual kangaroo mice, if it were present. Mitigation measures for this species have been developed and are discussed below. Generally speaking, mitigation measures would be employed prior to, and during mining activities that would greatly reduce the likelihood of dark kangaroo mouse habitat and individual mice being destroyed. Impacts to dark kangaroo mouse would be short-term and negligible.

General Wildlife

Small Mammals, Predatory Mammals, and Reptiles

Common small mammals (i.e., cottontail, jackrabbit, and ground squirrel), common predators (i.e., coyote, fox, and badger), and common reptiles (i.e., western fence lizard and sagebrush lizard) known to occur throughout the project area could be displaced into adjacent undisturbed habitat during operations, maintenance, and reclamation activities. However, some smaller and less mobile wildlife species could potentially be killed or injured during these activities. Impacts

to these species from operations, maintenance and reclamation activities would be long-term and minor.

Mule Deer

Occupied mule deer habitat is present throughout the project area although this habitat is of low to moderate value and mule deer are found in low densities. Noise and increased human activity in the project area would likely displace mule deer to adjacent habitat during operations, maintenance, and reclamation. Impacts to mule deer resulting from mining activities would be short-term and negligible.

Pronghorn Antelope

Occupied pronghorn antelope habitat is present throughout the project area and adjacent. Noise and increased human activity in the project area would likely displace pronghorn antelope to adjacent habitat during operations, maintenance, and reclamation. Impacts to pronghorn antelope resulting from mining activities would be short-term and negligible.

4.8.2.1 Mitigation

Greater Sage-Grouse

In order to minimize the possibility of impacting greater sage-grouse breeding, wintering, nesting and brood rearing, Midway would potentially employ the following measures:

- Modified transmission line structures, including all H-braces, line strike diverters, and perch deterrents , would be used for transmission lines constructed within two miles of known greater sage-grouse leks and within PPH designated Habitat as described in the Pan Mine Project Mitigation Plan (Appendix 4A); and

- Off-site mitigation would occur for impacted PPH and PGH. This mitigation would be implemented within habitat associated with the impacted population, the Diamond PMU, as described in the Pan Mine Project Mitigation Plan (Appendix 4A).

Ambient noise levels will be measured at the lek sites during spring of 2013. If modeled dB(A) values exceed the actual ambient noise plus 10 dB(A) levels, Midway would employ the following measures, where determined necessary by the BLM:

- Restrict traffic through areas within two miles of greater sage-grouse leks from March 1 through May 15 from one hour before sunrise until three hours after;

- Restrict construction activities during the period from March 1 through May 15 within two miles of active greater sage-grouse leks;

- Reduce vehicle speed limits on the access road during the period from March 1 through May 15;

- Create barriers along access road;

- Restrict the use of engine brakes on the access road: and

- Other appropriate mitigation measures that reduce noise levels at leks.

Pygmy Rabbit

- Pre-construction clearance surveys would occur prior to any surface disturbance. As pygmy rabbits are known to be active above ground throughout the year, these surveys would be required regardless of the season. If pygmy rabbit habitat is identified during pre-construction clearance surveys and occupied or unoccupied burrows are found, new disturbance would not occur within 200 feet of the areas. If disturbance of these areas is determined to be unavoidable, consultation with the appropriate BLM and NDOW wildlife biologists would occur to develop avoidance strategies and mitigation techniques.

Golden Eagle

- In Utah, Romin and Muck (1999) recommend habituating raptors to noise and other disturbance activities associated with a project. Specifically, these authors state that "beginning land use, human activities, or construction prior to the breeding season will allow a pair of raptors to "choose" whether the nest site is still acceptable considering the disturbance. Warning sirens at regular intervals have also been used to alert raptor pairs to potentially startling noises such as blasting. This technique has generally been used where there is no acceptable alternative to the proposed action. While loss of the nest site may occur, the goal of this technique is to avoid the loss of eggs or young and allow the adults an opportunity to select an alternate nesting site." These habituation techniques would be applicable to the Proposed Action. If activities such as blasting were to begin during early spring and summer, birds potentially nesting in proximity to the project area would either become habituated to the disturbance or seek another location for nesting. Pre-disturbance signals such as sounding sirens prior to blasting may be effective in limiting negative raptor responses to blasting. As sounding sirens prior to a blast is a standard safety practice at most mine sites, this technique would be implemented to reduce impacts; and

- Midway would fully implement and adhere to the construction techniques, design standards, and avian mortality reporting set forth in the BBCS for the Proposed Action.

Western Burrowing Owl

- Pre-construction clearance surveys for western burrowing owl would occur prior to any surface disturbance occurring from March 15 through August 31. If occupied western burrowing owl nesting territories are encountered, Midway would avoid the area within 0.25 miles of the active territory until a qualified biologist has determined the young have fledged and the nesting territory abandoned; and

- Midway would fully implement and adhere to the construction techniques, design standards, and avian mortality reporting set forth in the BBCS for the Proposed Action.

Other Raptors

- Midway would fully implement and adhere to the construction techniques, design standards, and avian mortality reporting set forth in the BBCS for the Proposed Action.

Migratory Birds

- Midway would fully implement and adhere to the construction techniques, design standards, and avian mortality reporting set forth in the BBCS for the Proposed Action.

Dark Kangaroo Mouse

- Pre-construction trapping for kangaroo mice would occur prior to any surface disturbance in areas determined to have potentially suitable habitat. If kangaroo mice exist, new disturbance would not occur within 200 feet of those areas. If disturbance of these areas is determined to be unavoidable, consultation with the appropriate BLM and NDOW wildlife biologists would occur to develop avoidance strategies and mitigation techniques..

4.8.2.2 Unavoidable Adverse Impacts on Wildlife Resources

The Proposed Action would permanently impact wildlife habitat throughout the project area. A permanent loss of 452 acres of rangeland would result from the unreclaimed portions of the Proposed Action (North Pan Pit, South Pan Pit, the process pond, and stormwater control facilities) (Figure 2.3-11). Although reclaimed areas would present wildlife habitat post-mining, 452 acres would still be permanently impacted. However, this change, and in some cases loss, of habitat would be small as compared to the available undisturbed wildlife habitat within the project area.

Some long-term unavoidable adverse effects on wildlife populations would potentially occur as a result of mortalities during construction and operation activities.

4.8.2.3 Irreversible and Irretrievable Commitments of Resources

An irreversible commitment of resources occurs if the commitment cannot be changed once made and once a resource is used, consumed, destroyed, or degraded during project construction, operation, and maintenance it cannot be reused or recovered for the life of the project or beyond. Both protected and general wildlife species within the project area may be subject to irretrievable commitment of resource with regard to the following types of disturbance: disquieting and excessive noise; increased human disturbance, habitat loss and fragmentation; and increased roads and vehicle traffic, for the life of the Proposed Action and beyond.

4.8.2.4 Relationship of Short-Term Uses and Long-Term Productivity

Temporary disturbance and loss of habitat used by numerous species of wildlife could be considered short-term. Most impacts to wildlife resources would initially result from construction activities and be temporary in duration, but some would persist for the operational life of the Proposed Action.

4.8.3 Waste Rock Disposal Site Design Alternative

The Waste Rock Disposal Site Design Alternative would result in the same types of impacts as described under the Proposed Action for construction and maintenance with the slight variations in the habitat types (vegetation community types) as shown in Table 4.7-2. However, the footprint of the waste rock disposal site alternative and the acreage of disturbed land would be 79 acres less.

4.8.3.1 Mitigation

Additional mitigation measures are not required.

4.8.3.2 Unavoidable Adverse Impacts on Wildlife

Unavoidable adverse impacts on wildlife would be 79 acres less than that described under the Proposed Action.

4.8.3.3 Irreversible and Irretrievable Commitments to Resources

Irreversible and irretrievable commitments to resources would be 79 acres less than that described under the Proposed Action.

4.8.3.4 Relationship of Short-Term Uses and Long-Term Productivity

Short-term uses and long-term productivity would be 79 acres less than that described under the Proposed Action.

4.8.4 Southwest Power Line Alternative

The Southwest Power Line Alternative would result in the same types of impacts to wildlife resources as described under the Proposed Action with the exception of slight variations in habitat types (community types) disturbed and impacts to greater sage-grouse, golden eagle, and western burrowing owl.

Greater Sage-Grouse

The Southwest Power Line Alternative would avoid the East Blackpoint lek by approximately 3.3 miles and Southwest Pancake Summit lek by approximately 4.29 miles.

The impacted habitat for greater sage-grouse includes the fenced area within the project area, the access road, as well as those areas within 600 meters of the proposed transmission line (Figure 4.8-1). Existing and refined impacted sage-grouse habitat acreages associated with the Southwest Power Line Alternative are shown Table 4.8-3.

Table 4.8-3 Southwest Power Line Alternative Greater Sage-Grouse Impacted Habitat

	PPH (acres)	PGH (acres)		PGH Net Difference (acres)
		Existing Mapping	Refined Mapping	
Impacted Habitat Associated with Southwest Power Line Alternative	1,211	3,058	2,469	589

Impacts to greater sage-grouse PPH and PGH associated with the Southwest Power Line Alternative would be the same as those associated with the Proposed Action. Impacts to greater sage-grouse from this alternative would be long-term and moderate, however slightly less significant than the Proposed Action because the transmission line and access road would not pass between two active greater sage-grouse leks and would impact approximately 1,441 fewer acres of PPH.

Golden Eagle

The impacts to golden eagles would be similar as those outlined under the Proposed Action, with the exception of impacting four additional golden eagle nesting territories within a five-mile

buffer of the transmission line. These impacts would be long-term and are not expected to exceed a moderate level.

Western Burrowing Owl
The impacts to western burrowing owls would be similar as those outlined under the Proposed Action, with the exception of impacting two known nesting territories within the survey area (400 feet of the center line). Owls would be avoided during construction (Section 4.8.3.1) and any unoccupied nesting territories that were impacted outside of the breeding season would displace owls during the following season to new or alternate burrows for that season. Impacts to western burrowing owl would be short-term and are not expected to exceed a minor level.

Operation, Maintenance, and Reclamation
No additional impacts to wildlife would occur as the result of ongoing operation and maintenance of mining facilities and as the result of ongoing operations and maintenance of transmission facilities.

4.8.4.1 Mitigation
Mitigation measures for the Southwest Power Line Alternative would be the same as those described under the Proposed Action.

4.8.4.2 Unavoidable Adverse Impacts on Wildlife Resources
Unavoidable adverse impacts on wildlife resources would be similar to that described under the Proposed Action.

4.8.4.3 Irreversible and Irretrievable Commitments to Resources
Irreversible and irretrievable commitments to wildlife resources would be similar to that described under the Proposed Action except for the loss of approximately 68 acres of additional wildlife habitat associated with the transmission line and the associate maintenance road.

4.8.4.4 Relationship of Short-Term Uses and Long-Term Productivity
Short-term uses and long-term productivity would be similar to that described under the Proposed Action.

4.8.5 No Action Alternative
Under the No Action Alternative, the Proposed Action would not be constructed and there would be no associated project impacts on wildlife resources excluding the previously authorized exploration activities (Section 2.2). Potential impacts to wildlife and special status species from the No Action Alternative are discussed below.

The prior access road to the project passes through the East Black Point sage-grouse lek. There are ongoing impacts to this lek from vehicle disturbance, noise, and fugitive dust. Currently, Midway, oil companies, cattle ranchers, and recreationists utilize this access road.

As part of the previously approved 2011 exploration POO and EA, Midway was granted permission for a new access road that lies approximately 1.6 miles east of the East Black Point lek and is 0.98 miles west of the Southwest Pancake Summit lek. The natural topography shelters the lek from view of the road. This new access road was constructed in November of 2012. Until the greater sage-grouse breeding season of 2013 occurs improvements to the existing impacts to greater sage-grouse from this new access road cannot be fully evaluated.

Impacts to wildlife and special status species from the No Action Alternative can be described in terms of the acreage disturbed. The No Action Alternative approved disturbance of 100 acres. This acreage represents approximately 0.007 percent of the NDOW Management Unit 131. Impacts would be discontinuous over the remaining areas. Further, impacts would be temporary because behavior patterns of big game species avoid human disturbance areas; however, big game species are expected to return when human disturbance ceases. Impacts to wildlife as a result of the No Action Alternative would be short-term and are not expected to exceed a negligible to minor level.

4.9 Range Resources

4.9.1 Indicators

Impacts to range resources were evaluated by considering the following:

- Number of livestock allotments that occur within the project area, and the AUMs supported by the allotments, or livestock currently approved to use these areas;
- Acres of rangeland to be affected by the project;
- Acres of land within an allotment to be affected by the project;
- Percentage of each allotment within the fenced portion of the project area that would be affected; and
- Estimated number of AUMs lost in each affected allotment.

4.9.2 Proposed Action

The project area includes approximately 13,454 acres of three allotments (Newark, South Pancake, and Duckwater allotments) (Figure 3.9-1; Table 4.9-1). Access to water sources for livestock would not be an issue as the available water sources are outside the project area. Anticipated environmental impacts to livestock and grazing resources include the loss of forage due to ground disturbance and restricted access to active mining areas for security and safety reasons. The anticipated impacts are described below.

Table 4.9-1 Grazing Allotments within the Project Area

Allotment	Total Allotment Acres*	Total Active AUMs in Allotment	Allotment Acres within Project Area	Number of AUMs in Project Area*	Allotment Acres in Fenced Mine Site Area plus Access Road	Percent of Allotment within Fenced Mine Site Area plus Access Road	Number of AUMs within Fenced Mine Site Area plus Access Road *
Newark	218,105	9,709	10,139	253	119	<1	3
South Pancake	31,088	1,155	2,593	65	2,633	8.5	66
Duckwater	822,329	2,814	722	18	0	0	0
Total		**13,678**	**13,454**	**336**	**2,752**	**8.7**	**69**

Source: (BLM, 2012g)
*Based on 40 acres per AUM

Construction

The primary impact on rangeland resources resulting from the Proposed Action would be a potential reduction in stocking rates because of access restrictions and the loss of vegetation/forage in disturbed areas for the life of the project. Approximately 2,752 acres of the Newark and South Pancake allotments would be within the fenced portion of the project area. This total includes 119 acres of the Newark allotment (less than one percent) and 2,633 acres of the South Pancake allotment (8.7 percent). Assuming that 40 acres is needed to support one AUM, the maximum potential impact would be a temporary loss of 69 AUMs (66 AUMs in South Pancake and three AUMs in Newark allotments) (Table 4.9-1), or about six percent of the active grazing preference. This would reduce the active grazing preference for the life of the mine. The actual stocking rate would also depend on other factors such as range condition. This would be a long-term negligible to minor loss of rangeland and would temporarily displace livestock during construction and operations of the Proposed Action.

Operations, Maintenance, and Reclamation

A permanent loss of 452 acres of rangeland would result from the unreclaimed portions of the Proposed Action (North Pan Pit, South Pan Pit, the process pond, and stormwater control facilities) (Figure 2.3-11). The permanent loss would be less than one percent of the allotment areas. Successful reclamation of and increased forage productivity associated with the WRDAs may partially compensate for the permanent loss of 11.3 AUMs. Under the Proposed Action, after reclamation impacts to range resources would be long-term and minor.

4.9.2.1 Mitigation

Additional mitigation measures are not required.

4.9.2.2 Unavoidable Adverse Impacts on Range Resources

The project would result in a loss of rangeland available to livestock for grazing. Reclamation of disturbed land can result in poorer vegetation productivity than the native rangeland. In areas

that are already degraded by noxious and invasive, non-native weeds, seeding efforts completed for disturbed areas could result in improved forage values.

4.9.2.3 Irreversible and Irretrievable Commitments of Resources

The project would result in a long-term commitment of 452 acres of rangeland resources that would no longer be available to livestock due to the areas not subject to reclamation.

4.9.2.4 Relationship of Short-Term Uses and Long-Term Productivity

Most impacts to range resources would result from short-term mining activities, although long-term impacts from the project would persist until successful reclamation was achieved. The impacts from mining activities are minor and would not affect long-term productivity.

4.9.3 Waste Rock Disposal Site Design Alternative

Construction

Impacts under the Waste Rock Disposal Site Design Alternative would be similar to the Proposed Action.

Operations, Maintenance, and Reclamation

The Waste Rock Disposal Site Design Alternative would result in the same types of range impacts as described under the Proposed Action, except, the area of long-term disturbance would be 79 acres less than that of the Proposed Action (Section 2.4.1; Figure 2.4-1).

4.9.4 Southwest Power Line Alternative

Construction

Construction impacts under the Waste Rock Disposal Site Design Alternative would be similar to the Proposed Action, except there is a loss of acres of 6.68 acres of forage in the Newark allotment and 17.6 acres in the Duckwater allotment.

Operations, Maintenance, and Reclamation

The Southwest Power Line Alternative would result in the same types of impacts to range resources as described under the Proposed Action except the impacts to range resources would include an additional 68 acres of disturbance associated with construction of the power line and its associated maintenance road. These 68 acres would be within the Duck Water allotment. Again, assuming that 40 acres is needed to support one AUM, this would represent 1.7 AUMs of the Duckwater allotment. This would be a long-term, negligible impact to range resources. This alternative is shown by vegetation type in Table 4.7-2.

4.9.5 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be constructed and there would be no associated project impacts on range resources excluding the previously authorized exploration activities (Section 2.2). Previously permitted exploration activities would result in the disturbance of 100 acres of rangeland (Figure 2.2-1) and the loss of less than three AUMs, based on an average stocking rate of 40 acres per AUM. This would be a long-term, negligible impact. This alternative is shown by vegetation type in Table 4.7-3.

4.10 Wild Horses

4.10.1 Indicators

Impacts to range resources were evaluated by considering the following:

- Number of horses currently approved to use these areas;
- Acres of land within a HMA to be affected by the project; and
- Loss of forage.

4.10.2 Proposed Action

Disturbance associated with the project would affect forage resources within the fenced portion of the project area for the short-term with long-term loss of forage in areas not reclaimed. The fenced area encompasses approximately 3,204 acres of the Pancake HMA. However, approximately 62 acres of this area that would be disturbed by the mine site was previously disturbed. Impacts to water resources within the project area are described in Section 4.2.

Construction

Impacts to wild horses within the Pancake HMA are expected to be minor. Potential impacts to wild horses from the Proposed Action include reduction in forage, displacement, and potential for collisions with vehicles. The anticipated habitat loss would be a long-term (i.e., for the life of the mine) impact to available forage, until reclamation is completed. The Proposed Action includes fencing 3,204 acres of the project area. This would be a short-term loss of habitat and would temporary displace wild horses. Impacts from mine blasting, equipment operation, and increased human presence in the project area would also temporarily displace wild horses. The location of project components (e.g., access road and fencing around the project) could intersect with daily movement routes between foraging areas. Impact to water resources is discussed in Section 4.2. Permanent impacts (i.e., those areas not reclaimed) would be long-term but negligible (452 acres, much less than one percent of the HMA) as the wild horses associated with the Pancake HMA would likely utilize forage throughout the remainder of the 855,000 acre area.

Operations, Maintenance, and Reclamation

Mining operations would displace wild horses into adjacent areas. It is anticipated that managing wild horses within the AML would minimize the potential for direct conflicts between mine activities and wild horses within the project area.

The EPMs outlined in Section 2.3.14 would be implemented to help minimize mortality to wild horses due to potential vehicular collisions.

4.10.2.1 Mitigation

Additional mitigation measures are not required.

4.10.2.2 Unavoidable Adverse Impacts on Wild Horses

The project would result in a short-term loss of 3,204 acres of rangeland and a long-term loss of 452 acres of rangeland available to wild horses for grazing. Reclamation of disturbed land can result in poorer vegetation productivity than the native rangeland. In areas already degraded by weeds, reclamation efforts could result in improved forage values following closure of the mine.

4.10.2.3 Irreversible and Irretrievable Commitments of Resources

The project would result in long-term commitment of 452 acres of rangeland resources available to wild horses from the mining facilities that are not subject to reclamation (Section 2.3.13).

4.10.2.4 Relationship of Short-Term Uses and Long-Term Productivity

Most impacts to range resources available for wild horses would result from short-term mining and reclamation activities, although a fair amount of long-term impacts from the project would persist until successful reclamation was achieved. The impacts from mining activities are negligible to minor and would not affect long-term productivity.

4.10.3 Waste Rock Disposal Site Design Alternative

The Waste Rock Disposal Site Design Alternative would result in the same types of wild horse impacts as described under the Proposed Action. Assuming that successful reclamation can be achieved on both WRDAs, long-term impacts to wild horses would be negligible.

4.10.3.1 Unavoidable Adverse Impacts on Range Resources

Unavoidable adverse impacts on range resources would be the same as for the Proposed Action.

4.10.3.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of range resources for wild horses would be the same as for the Proposed Action.

4.10.3.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term uses and long-term productivity of range resources would be the same as for the Proposed Action.

4.10.4 Southwest Power Line Alternative

The Southwest Power Line Alternative would result in the same types of impacts to wild horses as described under the Proposed Action as well as the addition of approximately 68 acres of short-term impacts associated with construction of the power line and associated maintenance road under the Southwest Power Line.

4.10.4.1 Unavoidable Adverse Impacts on Range Resources

Unavoidable adverse impacts on range resources would be the same as for the Proposed Action.

4.10.4.2 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of range resources for wild horses would be the same as for the Proposed Action.

4.10.4.3 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term uses and long-term productivity of range resources would be the same as for the Proposed Action.

4.10.5 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be constructed and there would be no associated project impacts on rangeland resources excluding the previously authorized exploration activities (Section 2.2). Existing authorized activities include up to 100 acres of disturbance and would result in short-term negligible impacts from displacement and loss of forage.

4.11 Cultural Resources

4.11.1 Indicators

The term "historic property" is defined in the NHPA as “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the NRHP”; such term includes artifacts, records, and remains which are related to such district, site, building, structure, or object. 16 U.S.C. Section 470(w)(5).

The following indicators were considered when analyzing potential impacts to historic properties (i.e., NRHP-eligible cultural resources):

- The number of NRHP-eligible sites impacted;
- The projected number of acres of NRHP-eligible site area impacted;
- Known historic features in or adjacent to project components; and
- The number of historic resources within the viewshed potentially impacted indirectly by the project.

No TCPs, as defined in Section 3.8, have been identified in the project area. Therefore, discussion of TCPs is not being carried forward in the impact analysis.

Assessment of potential effects or impacts on cultural resources is based on the NHPA regulations that define an effect as a direct or indirect alteration to the characteristics of a “historic property” that qualify it for inclusion in the NRHP. Adverse effects diminish the integrity of a property’s location, setting, design, materials, workmanship, feeling, or association.
As defined in 36 CFR 800.5, adverse effects on historic properties include, but are not limited to:

(i) Physical destruction of or damage to all or part of the property;

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;

(iii) Removal of the property from its historic location;

(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

(v) Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;

(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

(vii) Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

In accordance with the Programmatic Agreement (Section 3.11 and Appendix 3B), BLM, in consultation with the Nevada SHPO, would to the extent practicable ensure that effects to historic properties be avoided through project design, redesign, or relocation of facilities where feasible. When avoidance is not feasible an appropriate treatment plan would be designed, in consultation with SHPO, to lessen or mitigate project-related effects to historic properties.

4.11.2 Proposed Action

Potential impacts to cultural resources that are common to the Proposed Action and action alternatives include the following and are described below.

- Direct impacts to prehistoric and historic sites;
- Discovery of unanticipated finds during operations;
- Discovery of human remains during operations; and
- Access road impacts.

Construction

Prehistoric and historic sites eligible for listing in the NRHP are distributed throughout the project area. Direct impacts to NRHP-eligible prehistoric and historic sites, including surface or subsurface disturbance incurred during project construction would occur within the project area. These potential impacts would occur during the construction phase.

As stated in the Programmatic Agreement (Appendix 3B), all sites would be avoided where practicable by project design. If avoidance is not feasible, further mitigation must be taken by Midway in accordance with the Programmatic Agreement. A historic properties treatment plan has been developed that includes testing and/or mitigation of sites determined to be adversely affected. During construction activities, any unanticipated cultural resources discovered would

require that all work within a 100-meter area cease immediately and the BLM Authorized Officer be notified immediately. BLM would then evaluate the discovery in coordination with other consulting parties in order to determine and implement appropriate treatment, if necessary.

There are 75 NRHP-eligible cultural resource sites (i.e., historic properties) known to be within the project area (Table 3.11-1). These include 67 historic sites, one prehistoric site, and seven multi-component sites. Impacts could potentially be avoided through construction design modification or mitigated through data recovery studies. The segment of Lincoln Highway within the project area would be directly impacted as it would be rerouted outside of the project area. Impacts to cultural resources would be minor to moderate and long-term (Figure 3.11-11).

Operation, Maintenance, and Reclamation

No additional direct impacts to NRHP-eligible cultural resources from operations, reclamation, and reclamation would be anticipated after construction.

Increased public access into the general area increases the potential for unauthorized artifact collection and vandalism at nearby sites, which could result in indirect impacts.

4.11.2.1 Mitigation

Adverse impacts to NRHP-eligible cultural resources would be mitigated as directed by the Programmatic Agreement.

Mitigation for the segment of the Lincoln Highway includes:

- Video documentation of existing condition and route; and
- Reroute segment of Lincoln Highway.

4.11.2.2 Unavoidable Adverse Impacts on Cultural Resources

Unavoidable or residual adverse impacts to NRHP-eligible cultural resource sites would include compromised site integrity and loss of data due to physical damage to the sites. Impacts would be mitigated to the extent possible through data recovery or other appropriate treatment prior to any construction or operation activities through the approved treatment plan. The presence of upgraded public access roads could lead to increased casual visitation to nearby site locations resulting in greater vulnerability to site disturbance, unauthorized artifact collection, and vandalism following closure of the mine.

4.11.2.3 Irreversible and Irretrievable Commitments of Resources

Any loss of context or destruction of NRHP-eligible or unevaluated cultural resource sites would constitute an irreversible commitment of that resource. This loss would be site-specific, as well as a loss of cumulative data on the local and regional level. Mitigation of impacts through data recovery would also constitute an irreversible commitment of that resource.

4.11.2.4 Relationship of Short-Term Uses and Long-Term Productivity

The short-term use of the area during project activities would result in adverse effects to cultural resource sites located within the project area. These impacts would be mitigated to the extent

possible through data recovery or other appropriate treatment. The potential for inadvertent damage or destruction of cultural sites during construction, operation, maintenance, or associated activities, could result in the loss of significant information. Further, information and data retrieved through mitigation measures (i.e., data recovery) would represent short-term use of cultural resources at the expense of future research opportunities. Therefore, long-term productivity would be lost.

4.11.3 Waste Rock Disposal Site Design Alternative

Construction

Impacts under the Waste Rock Disposal Site Design Alternative would be essentially the same as the Proposed Action, except it would result in approximately 79 fewer acres of disturbance.

Operations, Maintenance, and Reclamation

Impacts would be to the same as those described under the Proposed Action, except it would result in approximately 79 fewer acres of disturbance.

4.11.4 Southwest Power Line Alternative

Construction

If the Southwest Power Line Alternative is selected cultural resource surveys would be conducted prior to construction and appropriate mitigation measures would be implemented.

Operations, Maintenance, and Reclamation

Impacts would be essentially the same as those described under the Proposed Action.

4.11.5 No Action Alternative

Under the No Action Alternative, the project would not be constructed and there would be no associated project impacts on NRHP-eligible cultural resource sites (historic properties) or historic resources.

4.12 Native American Concerns

4.12.1 Indicators

The analysis of potential impacts to Native American Concerns and Traditional Values is based on a review of known tribal interests, traditional cultural places, trust assets/treaty rights resources, and consultation with the potentially affected Tribes (Section 3.12).

There are no known potential places of cultural and/or geographic interest to the Tribes within or near the project area. No formal or informal issues or concerns have been raised to date by the various Tribes regarding any religious or traditional cultural property concerns for the Pan Mine Project.

Impacts to prehistoric cultural resource sites are disclosed in Section 4.11. Consultation with the Tribes regarding impacts to NRHP-eligible prehistoric cultural resource sites is required under Section 106 of the NRHP.

4.12.2 Proposed Action

Various Tribes have been consulted or informed of the proposed project, and no specific concerns have been raised to date by these various tribes regarding any religious site, sacred site, or traditional cultural property. If Native American concerns emerge through consultation, BLM will consult with the appropriate Tribe(s) and individuals to obtain information about those concerns, the importance of the resource, and what mitigation measures might be appropriate, such that BLM can determine an appropriate course of action taking that information into account.

No TCPs or EO 13007 (Executive Order on the Indian Sacred Sites) sites have been identified within the project area that might be impacted by the Proposed Action. Therefore, no impacts to Native American religious concerns are anticipated from the Proposed Action.

4.12.2.1 Mitigation

Additional mitigation measures are not required.

4.12.2.2 Unavoidable Adverse Impacts on Native American Concerns

There would be no unavoidable adverse impacts on Native American Concerns.

4.12.2.3 Irreversible and Irretrievable Commitments of Resources

There would be no irreversible or irretrievable commitments of resources of Native American Concerns or Traditional Values.

4.12.2.4 Relationship of Short-Term Uses and Long-Term Productivity

In the short-term, there would be no impacts to known Native American Concerns or Traditional Values. There would not be impacts to long-term productivity.

4.12.3 Waste Rock Disposal Site Design Alternative

Impacts would be to the same as those under the Proposed Action, except it would result in approximately 79 fewer acres of disturbance.

4.12.4 Southwest Power Line Alternative

Impacts would be to the same as those under the Proposed Action.

4.12.5 No Action Alternative

Under the No Action Alternative, there would be no impacts to Native American Concerns or Traditional Values as a result of the project as the mine and associated facilities would not be constructed. Tribes were consulted during the Pan Exploration EA and no concerns were expressed.

4.13 Land Use and Access

4.13.1 Land Use Plans and Policies

The Ely District RMP favors a balanced approach to land management that protects fragile resources but doesn't overly restrict the development of other resources for economic goods and services. None of the alternatives analyzed in this DEIS conflict with the management goals and objectives of the current RMP.

4.13.2 Land Use and Ownership

The dominant land uses in the project area are livestock grazing/ranching, mining, hunting, and dispersed recreation. The public lands administered by the BLM are managed for multiple-use. Impacts of the project to BLM grazing allotments are discussed under Range Resources in Section 3.9. Impacts of the project to recreation and hunting as a form of recreation are discussed in Section 3.15.

4.13.3 Indicators

Impacts on land use and access caused by project construction or operation were evaluated by determining the potential for:

- Conflicts with existing federal, state, and local land use plans, and policies;
- Conflicts with existing BLM land use authorizations;
- Restricted access; and
- Increased traffic on roads.

4.13.4 Proposed Action

The Proposed Action is consistent with the BLM, Ely District RMP and applicable county land use plans. The Proposed Action would comply with adopted plans and policies of potentially affected governmental entities.

Access to the project area would be primarily via U.S. Highways 50 and 6, as well as Interstate 80, and SR 278, SR 379, and SR 93. The Proposed Action and the associated power line would not conflict with any existing ROWs. The Proposed Action would result in active mining areas being restricted from public access for the life of the mine for the safety of the public and to protect mine property. Approximately 3,204 acres of the mine facilities would be fenced and would be restricted during active mining and reclamation.

There would be no additional impacts to land use beyond those already presented in specific resource sections such as Sections 4.3 (Geology and Minerals), Sections 4.8 (Wildlife), 4.9 (Range), Section 4.10 (Wild Horses) and Section 4.15 (Recreation).

Operation, Maintenance, and Reclamation

No additional impacts to land use would occur as the result of ongoing operation and maintenance of mining facilities. Post-reclamation land use of most of the project area would be

returned to geology and mineral resources, wildlife habitat, livestock grazing, recreation, and wild horse habitat as approximately 2,752 acres of the total new disturbance (approximately 3,204 acres) would be reclaimed. These uses would be consistent with local and BLM land use plans and guidelines. The North Pan Pit and South Pan Pit, as well as the process pond and stormwater control facilities (Figure 2.3-11), would remain un-reclaimed, resulting in a permanent change from current uses (a reduction in approximately 452 acres available for post-mining uses). Midway has committed to constructing barriers around the un-reclaimed pits for the safety of the public.

4.13.4.1 Mitigation

Additional mitigation measures are not required.

4.13.4.2 Unavoidable Adverse Impacts on Land Use and Access

Unavoidable adverse impacts on land use and access under the Proposed Action include restricting public access for the life of the mine and any permanent or un-reclaimed disturbance areas created during mining activities.

4.13.4.3 Irreversible and Irretrievable Commitments to Resources

The irreversible and irretrievable commitments to land use resources under the Proposed Action would include permanent disturbance areas not subject to reclamation.

4.13.4.4 Relationship of Short-Term Uses and Long-Term Productivity

In the short- and long-term there would be a temporary loss of access and in the long-term there would be a loss of open space due to permanent disturbance areas not subject to reclamation.

4.13.5 Waste Rock Disposal Site Design Alternative

The Waste Rock Disposal Site Design Alternative would result in the same types of impacts as described under the Proposed Action, except it would result in approximately 79 fewer acres of disturbance.

4.13.5.1 Mitigation

Additional mitigation measures are not required.

4.13.5.2 Unavoidable Adverse Impacts on Land Use and Access

Unavoidable adverse impacts on land use and access would be similar to that described under the Proposed Action, with approximately 79 fewer acres of disturbance.

4.13.5.3 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be similar to that described under the Proposed Action, except it would result in approximately 79 fewer acres of disturbance.

4.13.5.4 Relationship of Short-Term Uses and Long-Term Productivity

Short-term uses and long-term productivity would be similar to that described under the Proposed Action, except it would result in approximately 79 fewer acres of disturbance.

4.13.6 Southwest Power Line Alternative

The Southwest Power Line Alternative would result in the same types of impacts as described under the Proposed Action except for potential granting of ROWs for construction of a power line changing the land use.

Construction and maintenance of the Southwest Power Line Alternative would be consistent with the BLM, Battle Mountain RMP and applicable county land use plans, as well as comply with adopted plans and policies of potentially affected governmental entities.

Operation, Maintenance, and Reclamation

No additional impacts to land use would occur as the result of ongoing operation and maintenance of mining facilities and as the result of ongoing operations and maintenance of transmission facilities.

4.13.6.1 Mitigation

Additional mitigation measures are not required.

4.13.6.2 Unavoidable Adverse Impacts on Land Use and Access

Unavoidable adverse impacts on land use and access would be similar to that described under the Proposed Action.

4.13.6.3 Irreversible and Irretrievable Commitments to Resources

Irreversible and irretrievable commitments to resources would be similar to that described under the Proposed Action except for the loss of existing land use of the affected power line ROW constitutes an irretrievable commitment.

4.13.6.4 Relationship of Short-Term Uses and Long-Term Productivity

Short-term uses and long-term productivity would be similar to that described under the Proposed Action except for impacts from changes in land use as a result of ROWs being granted.

4.13.7 No Action Alternative

Under the No Action Alternative, authorized exploration activities would continue as discussed in Section 2.2. There would be no change in existing impacts to land use and access.

4.14 Visual Resources

This section discusses the potential impacts that the Proposed Action and Action Alternatives would be expected to have on visual resources and their consistency with the VRM objectives.

4.14.1 Indicators

The indicators listed below were considered when analyzing the potential impact that each alternative would have on visual resources:

- Degree of contrast with established BLM VRM classes; and
- Change in scenic quality of the existing landscape from each of the KOPs.

The assessment of potential impacts on visual resources resulting from the Proposed Action and the other alternatives was completed using the BLM Visual Contrast Rating System. Under the BLM Visual Contrast Rating System, the extent of an alternative's impact is dependent on the degree of visual contrast that the proposed project would have with the existing landscape features in terms of form, line, color, and texture. A detailed description of the BLM Visual Contrast Rating System is provided in BLM Manual H-8431: Visual Resource Contrast Rating (BLM, 1986a).

A comparison of the proposed project features that would be visible under each alternative and the existing landscape features was performed for each KOP (Figure 3.14-2). Computer-generated visual simulations of the proposed project in its operational phase for each alternative were produced as an aid in visualizing the changes that would be imposed on the existing viewshed based on the three established KOPs. The computer-generated visual simulations are effectively the photograph of the existing landscape taken at each KOP, but with modifications to show the proposed project and its associated changes on the landscape on the photograph. The visual simulations were reviewed to identify the form, line, color, and texture that characterizes the proposed project. This information was compared to the form, line, color, and texture elements of the existing landscape in order to quantify the degree of contrast an alternative would be expected to have. The results of this comparison and expected degree of contrast were applied to the effect indicators listed above to determine the potential for each alternative to impact visual resources. The existing conditions photographs and the visual simulations prepared for each KOP are provided in Appendix 3C.

4.14.2 Proposed Action

Implementation of the Proposed Action would result in the construction, operation, and eventual reclamation of the proposed project. The construction of the proposed project would require surface disturbances that remove existing vegetation cover from within the project area. Removal of vegetation cover would introduce form, line, color, and texture elements that contrast with the features of the existing landscape.

Construction would also require mass-grading or reshaping of soils and landforms for the construction of roads, pits, waste rock disposal areas, heap leach pads, and other project facilities described in Chapter 2 of this EIS. Implementation of the Proposed Action would require ancillary facilities and structures to be installed, including fencing, buildings, and a new power line roughly parallel with and adjacent to U.S. Highway 50 then south following the access road. These project components and facilities would also introduce form, line, color, and texture elements that contrast with the features of the existing landscape.

Operation of the proposed project would require that most of the project components and facilities persist through the life of the project. Thus, the four visual resource elements affected by the proposed project are anticipated to last through the life of the project. Project personnel, materials, and vehicles and equipment present in the project area during construction and operation may be visible from outside the project area boundaries at times. Visibility of the project personnel, materials, and vehicles and equipment would also introduce form, line, color, and texture elements that contrast with the features of the existing landscape.

Concurrent reclamation during operation of the proposed project would reduce the degree of contrast between the existing landscape features and the proposed project. During final reclamation of the project area, all project materials and vehicles and equipment would be removed from the project area. Fencing, power lines, and other ancillary facilities and structures would be disassembled and removed from the area. Project features would be graded to contours that resemble surrounding landforms to the extent possible and then seeded to establish vegetation cover. Thus, reclamation would reduce the visibility of the proposed project and lessen the degree of contrast with the existing landscape features.

The project area and the surrounding existing landscape consist of areas that are designated as BLM VRM Class III and IV, as shown on Figure 3.14-1. Because the project area is located in these VRM classes, the form, line, color, and texture elements that would be added to the landscape during construction, operation, and reclamation of the proposed project would be as well. The changes to the scenic quality of the existing landscape at each KOP (Figure 3.14-2) as a result of the addition of these elements are discussed below. The degree of contrast that the form, line, color, and texture elements of the proposed project would have with the features of the existing landscape at each KOP is also discussed below.

The construction and operation of the proposed project during night hours would have a substantially different type of impact on visual resources than construction and operation during day hours. Most of the form, line, color, and texture elements of the proposed project and the existing landscape features would not be visible from the KOPs or elsewhere during the night. However, lights used on project equipment and vehicles during night time operations, and stationary lights positioned at various locations within the project area would be visible. Use of project lights would contribute to the illumination of night sky in an area that is largely uninhabited. The night sky over uninhabited, dark areas is optimal for viewing stars and constellations. As illumination of the night sky is increased over an uninhabited and dark area, the number of astral and stellar features that are visible from that area is reduced, and thus the night sky is adversely impacted. Illumination resulting from use of the proposed project lights would have a negligible impact on the night sky because there are very few existing light sources in the area and the ambient light level is very low.

Even though the proposed project lights would cause negligible impacts on night sky lighting, they would have a strong contrast against the black backdrop of the night when looking directly at them, as opposed to viewing the sky near them. Because there are very few existing lights

sources in the area and the ambient light level is very low, any lights used for the proposed project would be surrounded by an otherwise dark, unlit background. The brightness of the lights and darkness of the black or nearly black background would create a strong contrast, and thus make the lights readily visible. Motorists travelling on U.S. Highway 50, SR 892, and SR 379 would constitute the majority of observers in the area during night hours, and thus to whom lights used for the project would be visible. The impact would be expected to be for several minutes to passing motorists.

KOP 1

Based on the visual simulation (Appendix 3C), the proposed heap leach pad and the waste rock disposal site north of the heap leach pad would be the most readily visible components of the proposed project from KOP 1. Both of these components are located in the middle-ground area where gently rolling hills characterize the form and line elements of the existing landscape. The heap leach pad and waste rock disposal site are characterized by near horizontal and regular lines that would create moderate contrast with the irregular lines of the rolling hills and vegetation. The heap leach pad would appear gold to light orange-brown in color. This color would have a moderate contrast with the dark-brown, monotone color of the rolling hills in the surrounding middle-ground area. The waste rock disposal site would appear brown in color. The color would be lighter than, and have a minor contrast with the dark-brown color of the surrounding rolling hills. The color of both the heap leach pad and the waste rock facility would be the direct effect of an absence of vegetation cover during operation of the proposed project. The horizontal and regular lines of the heap leach pad and waste rock disposal site would have a moderate degree of contrast with line, form, and texture elements of the surrounding vegetation.

The portion of the project area where the proposed heap leach pad would be located is designated as BLM VRM Class IV. The moderate degree of contrast that the proposed heap leach pad would have with the form, line, and color elements of the features of the existing landscape conforms with the management objectives of VRM Class IV. The North waste rock disposal site would be located in an area that is designated as BLM VRM Class III. The moderate to minor degree of contrast that it would have with the existing landscape features does not conflict with the management objectives of VRM Class III. The North waste rock disposal site would attract attention, but the minor degree of contrast between its color and the color of surrounding middle-ground area would prevent it from dominating the casual observer's view from KOP 1.

The proposed widening of the existing access road between U.S. Highway 50 and the proposed heap leach pad is the only other project component that appears in the visual simulation prepared for KOP 1. The access road appears as a thin, nearly horizontal line located along the toe of slope on the rolling hills in the middle-ground area. The visible line is the result of the cut into the hillside that would be required for the placement of the road on the rolling topography. The nearly horizontal direction of line element introduced into the landscape by the access road would have a moderate degree of contrast with the line elements of features in the middle-ground area surrounding it. The line appears very light-brown to light-tan in color, and would

contrast with the dark-brown color of the middle-ground area. However, because the color element introduced by the access road would occur as a very thin line, it would have only a moderate degree of contrast with the colors of the existing landscape features.

The section of the proposed access road visible from KOP 1 would be located within an area that has been designated as BLM VRM Class III (Figure 3.14-1). The degree of contrast that the proposed access road would have with the existing landscape would not exceed moderate. The access road would attract attention but not dominate the casual observer's view from KOP 1. The proposed access road would resemble the nearly vertical lines formed by color patterns in vegetation cover in the most distant areas of the foreground. Accordingly, the visual contrast and intrusion of the proposed access road would be compliant with the management objectives of BLM VRM Class III. Impacts would be minor to moderate.

Following the active mining period (i.e., operation of the proposed project), the waste rock disposal areas would be graded to restore contours to conditions resembling natural landforms to the extent feasible, and then it and the heap leach pad would be seeded to establish vegetation. After vegetation is established, the contrast with natural surroundings would be less noticeable from KOP 1 than they appear to be in the visual simulation. Because all impacts would be visible during the operation of the project, and some after reclamation of the project, impacts would be considered long-term.

KOP 2

Based on the visual simulation (Appendix 3C), the project components that would be visible from KOP 2 include the proposed power line that would be constructed next to U.S. Highway 50, and those components that would also be visible from KOP 1.

As described above, the components that would be visible from KOP 1 include the proposed heap leach pad, the waste rock disposal site north of the heap leach lad, and the proposed access road between the heap leach pad and U.S. Highway 50. These components would appear in the middle-ground area of the landscape viewed from KOP 2, which is where they would appear when viewed from KOP 1. The form, color, and line elements of these components would also appear identical to KOP 1 from KOP 2. Accordingly, the degree of contrast that the heap leach pad and waste rock disposal sites would have with the existing landscape features would be the same as described for KOP 1. The contrast with the existing landscape resulting from the addition of either of these project components would not conflict with the objectives of BLM VRM Class III or IV.

The proposed power line would be visible in the foreground area and extend into the closer regions of the middle-ground area. The pole structures used for the power line would introduce tall, vertical lines with bold edges and a smooth texture to the foreground area. The color of the poles would be light-brown to brown, and non-reflective. The overhead conductor wires would be introduced thin, curvilinear lines that have no distinguishable texture to the foreground area. The wires would appear gray in color, and become increasingly lighter gray with distance from the KOP location. The power poles would also become increasingly lighter brown in color with distance from the KOP location. There are several power pole structures in the existing

landscape that are located in the foreground area that contribute line, color, and texture elements that are similar to those that would be introduced from the power line. There are also road signs and several trees visible in the foreground, which contribute tall, vertical lines to the foreground area. The addition of the proposed power line would only increase the quantity and frequency of which these elements appear in the foreground. The degree of contrast would be moderate because of the increased quantity and frequency of tall, vertical lines, and the addition of thin, subtle curvilinear lines. The power line would not be expected to dominate the view of the casual observer, but may attract their attention. The visual contrast resulting from the proposed power line would be in compliance with the objectives of BLM VRM Class III, which is the designation of the foreground area.

The components of the proposed project that would be visible from KOP 2 as a result of implementation of the Proposed Action would contrast with the existing landscape features. The degree of contrast would be moderate to strong for the brief period that the proposed project would be visible to the casual observer. The scenic quality of the existing landscape would be altered, but generally retained as the project components would not be expected to dominate the view of the casual observer. Thus, impacts on visual resources during construction and operation would be moderate.

Following the active mining period (i.e., operation of the proposed project), the waste rock disposal areas would be graded to restore contours to conditions resembling natural landforms to the extent feasible, and then it and the heap leach pad would be seeded to establish vegetation. After vegetation is established, the contrast with natural surroundings would be less noticeable from KOP 2 than they appear to be in the visual simulation. The proposed power line would be disassembled and removed from the area. Because all impacts would be visible during the operation of the project, and some after reclamation of the project, impacts would be considered long-term.

KOP 3

Based on the visual simulation (Appendix 3C), the proposed heap leach pad and the north waste rock disposal site would be the only project components that are visible from KOP 3. The color, line, and form elements of the heap leach pad and waste rock disposal site appear identical in the visual simulation for this KOP as they do in the simulation for KOP 1. Both project components are also located in the middle-ground area of the landscape viewed from KOP 3. Accordingly, the degree of contrast that the heap leach pad and waste rock disposal site would have with the existing landscape features would be the same as described for KOP 1. The contrast with the existing landscape resulting from the addition of either of these project components would not conflict with the objectives of BLM VRM Class III or IV.

The components of the proposed project that would be visible from KOP 3 as a result of implementation of the Proposed Action would contrast with the existing landscape features. The degree of contrast would not exceed moderate. The scenic quality of the existing landscape would be altered, but generally retained as the project components would not be expected to

dominate the view of the casual observer. Thus, impacts on visual resources during construction and operation would be minor to moderate at KOP 3.

KOP 4

A visual simulation was not prepared for KOP 4. Based on the position of the KOP relative to the proposed project components and existing topography of the landscape, the proposed access road from U.S. Highway 50 into the project area and the proposed power line next to the access road would be visible. Existing topography would be expected to prevent the proposed heap leach pad, waste rock facilities, or other major project components from being visible at KOP 4.

The proposed access road and adjacent power line would appear in the foreground area of the landscape. Based on the visual simulation prepared for KOP 2, the pole structures used for the power line would introduce tall, vertical lines with bold edges and a smooth texture to the foreground area. The color of the poles would be light-brown to brown, and become increasingly lighter brown in color with distance from the KOP location. The overhead conductor wires would introduce thin, curvilinear lines that have no distinguishable texture to the foreground area. The wires would appear gray in color, and become increasingly lighter gray with distance from the KOP location. The power line would have a moderate degree of contrast with the features in the existing landscape because there are very few vertical lines, and any that do occur are generally not tall. There are other bold lines in the foreground area associated with the edge of pavement on U.S. Highway 50, and road signs next to the highway. The visibility of these lines would be expected to prevent the proposed power line from dominating the view of the casual observer at KOP 4.

The proposed access road would introduce form and line elements similar to those associated with U.S. Highway 50. The form and line elements associated with the proposed access road would appear more subtle from than the those associated with the highway when viewed from the KOP of other distant locations because the proposed road would not be paved or include road striping. However, these elements would not appear any less subtle to casual observers travelling on U.S. Highway 50. The form and line elements associated with the proposed access road would attract the attention and be readily apparent to these casual observers. Vegetation would be removed within the roadway width, and natural soils or gravel would be applied to the surface. This would create colors and texture that contrast with the existing vegetation that would remain on either side of the road. The degree of contrast would be moderate near the location of the KOP, and moderate to negligible farther from the KOP. The presence of U.S. Highway 50 and several other paved and unpaved roads in the distant foreground and middle-ground area would be expected to prevent the proposed access road from dominating the view of the casual observer.

Although it is expected that the proposed heap leach pad, waste rock facilities, or other major project components would not be visible from KOP 4, it is unknown whether existing topography would obstruct the views of minor project components, specifically the proposed ancillary facilities. If any ancillary facilities are visible, the exterior surfaces of these facilities would be

anticipated to introduce color elements adversely contrasting with the color elements common to the characteristic landscape. Colors introduced by the proposed project would be anticipated to have an adverse contrast because the characteristic landscape does not contain any existing buildings or other structures constructed of materials similar to those that would be used for the proposed ancillary facilities. The contrasting color of the ancillary facilities may intensify the contrast that form, line, and texture elements introduced by the facilities have with the characteristic landscape. Mitigation measures would be employed to reduce the visual contrast associated with, or the result of the color, of any proposed ancillary facilities visible from KOP 4. Recommended mitigation measures are described in Section 4.14.2.1.

The sections of the proposed power line and access road visible from KOP 4 would be located in areas that are designated as BLM VRM Class III. Any proposed ancillary facilities visible from KOP 4 would also be located in areas that are designated as BLM VRM Class III. The visual contrast resulting from their addition to the landscape would not exceed moderate, and would be compliant with the management objectives of BLM VRM Class III. The scenic quality of the existing landscape may be altered, but generally retained as the project components would not be expected to dominate the view of the casual observer with mitigation measures employed. Thus impacts on visual resources during construction and operation would be moderate to minimal at KOP 4.

4.14.2.1 Mitigation

The exterior surfaces of any ancillary facilities visible from KOP 4 should be painted with non-reflective *shale green* if located in pinyon-juniper vegetation or *shadow gray* if located in shrublands or other open areas. Other non-reflective colors of paint, as determined by the BLM, may be used in place of *shale green* or *shadow gray*.

4.14.2.2 Unavoidable Adverse Impacts on Visual Resources

During construction and operation of the proposed project, unavoidable adverse impacts to visual resources would include the visibility of construction equipment and personnel, and possible fugitive dust emissions from disturbed areas within the project area. Project components and facilities visible during operation of the proposed project visible from one or more KOPs are required for the operation of the project, and the visibility of these components is unavoidable.

4.14.2.3 Irreversible and Irretrievable Commitment of Resources

The form, line, color, and texture elements created by the proposed mining pits that would remain open after reclamation of the proposed project would represent irreversible and irretrievable commitment of visual resources. However, mining pits would not be visible from any of the KOPs based on the visual simulations. Reclamation of some project components, such as the waste rock disposal site and the heap leach pad would lessen the contrast these components would have, but not eliminate the contrast entirely.

4.14.2.4 Relationship of Short-Term Uses and Long-Term Productivity

There are no known short-term uses of visual resources that would adversely affect the maintenance and enhancement of long-term productivity.

4.14.3 Waste Rock Disposal Site Design Alternative

The impacts associated with the construction, operation, and reclamation of the Waste Rock Disposal Site Design Alternative would be the same, only smaller, than those described for the Proposed Action. The project components that would be visible from each of the KOPs under implementation of this alternative are the same components that would be visible from the KOPs under the Proposed Action. However, the proposed north waste rock disposal site would be split into two. Approximately half of the facility would be located out of view from the KOPs, to the east and behind a ridge. The north waste rock disposal site would appear slightly smaller (79 acres smaller) from KOP 1, KOP 2, and KOP 3 under this alternative. It would not be visible from KOP 4. Thus, the contrast it would have with the existing landscape features would be slightly less than the contrast it would have under the Proposed Action at each KOP. However, the slight variation in size and contrast would not change the overall impact that this alternative would have on visual resources. Like the Proposed Action, the Waste Rock Disposal Site Design Alternative would be in conformance with the objectives of the BLM VRM Class III and IV, and have a moderate impact on visual resources.

4.14.3.1 Mitigation

Mitigation measures are the same as those described for the Proposed Action in Section 4.14.2.1.

4.14.3.2 Unavoidable Adverse Impacts on Visual Resources

Unavoidable adverse impacts on visual resources caused by the Waste Rock Disposal Site Design Alternative would be the same only smaller than those described for the Proposed Action.

4.14.3.3 Irreversible and Irretrievable Commitment of Resources

Irreversible and irretrievable commitments of visual resources would be the same only smaller than those described for the Proposed Action.

4.14.3.3 Relationship of Short-Term Uses and Long-Term Productivity

There are no known short-term uses of visual resources that would adversely affect the maintenance and enhancement of long-term productivity.

4.14.4 Southwest Power Line Alternative

The impacts associated with the construction, operation, and reclamation of the Southwest Power Line Alternative would be the same as those described for the Proposed Action, except for the associated with the power line and associated maintenance road. Under the Southwest Power Line Alternative the proposed power line would be constructed to follow U.S. Highway 50 and SR 379. This alignment would result in impacts related to the power line extending for approximately 25 miles longer into an area where there are no existing power lines. Following

the U.S. Highway 50 and SR 379 alignment, the proposed power line would appear in the foreground areas of KOP 1 and KOP 3.The proposed power line would not be visible from KOP 2 or KOP 4 under the Southwest Power Line Alternative. All other project components that would be visible from each of the KOPs under the Proposed Action would be visible under implementation of this alternative. The visual impacts associated with each KOP are described in detail below.

KOP 1

Based on the visual simulation (Appendix 3C), the project components that would be visible from KOP 1 include the proposed heap leach pad, waste rock disposal site north of the heap leach pad, and the power line that would be constructed next to U.S. Highway 50 near its intersection with SR 379. The color, line, and form elements of the heap leach pad and waste rock disposal site would appear identical to the Proposed Action. Like the Proposed Action, both of these project components would also be located in the middle-ground area of the landscape at KOP 1. Accordingly, the degree of contrast that the heap leach pad and waste rock disposal site would have with the existing landscape features would be the same as described for KOP 1. The contrast with the existing landscape resulting from the addition of either of these project components would not conflict with the objectives of BLM VRM Class III or IV.

The proposed power line would appear in the foreground area of the landscape at KOP 1 under the Southwest Power Line Alternative. Based on the visual simulation prepared for KOP 1, the pole structures used for the power line would introduce tall, vertical lines with bold edges and a smooth texture to the foreground area. The color of the poles would be light-brown to brown, and become increasingly lighter brown in color with distance from the KOP location. The overhead conductor wires would introduce thin, curvilinear lines that have no distinguishable texture to the foreground area. The wires would appear gray in color, and become increasingly lighter gray with distance from the KOP location. The power line would have a moderate degree of contrast with the features in the existing landscape because there are no vertical lines in the foreground area. There are other bold lines in the foreground area associated with the edge of pavement on U.S. Highway 50, but these lines are curvilinear and not vertical. The line and form associated with U.S. Highway 50 tends to dominate the view within the context of the foreground area. The highway would be expected to continue to dominate the foreground view after the proposed power line has been constructed.

The components of the proposed project that would be visible from KOP 1 as a result of implementation of the Southwest Power Line Alternative would contrast with the existing landscape features. The degree of contrast would not exceed moderate. The scenic quality of the existing landscape may be altered, but generally retained as the project components would not be expected to dominate the view of the casual observer. Thus impacts on visual resources during construction and operation would be moderate to minimal at KOP 1.

KOP 2

The degree of contrast and impacts associated with the proposed project would be the same for the Southwest Power Line Alternative as described for the Proposed Action for KOP 2.

However, the contrast and impacts related to the proposed power line that would be visible from this KOP under the Proposed Action would not apply under implementation of the Southwest Power Line Alternative. The proposed power line would be constructed to follow the southwest alignment along U.S. Highway 50 and SR 379 under the Southwest Power Line Alternative, and would not be visible from KOP 2.

The degree of contrast would not exceed moderate and would be compliant with the objectives of BLM VRM Class III and IV. The scenic quality of the existing landscape may be altered, but generally retained as the project components would not be expected to dominate the view of the casual observer. Thus impacts on visual resources during construction and operation would be moderate to minimal.

KOP 3

Based on the visual simulation (Appendix 3C), the project components that would be visible from KOP 3 include the proposed heap leach pad, waste rock disposal site north of the heap leach pad, and the power line that would be constructed next to U.S. Highway 50 near its intersection with SR 379. Under this alternative, the color, line, and form elements of the heap leach pad and waste rock disposal site would appear identical to the Proposed Action. Like the Proposed Action, both of these project components would also be located in the middle-ground area of the landscape at KOP 3. Accordingly, the degree of contrast that the heap leach pad and waste rock disposal site would have with the existing landscape features at KOP 3 under this alternative would be the same as described for the Proposed Action. The contrast with the existing landscape resulting from the addition of either of these project components would not conflict with the objectives of BLM VRM Class III or IV.

The proposed power line would appear in the foreground area of the landscape at KOP 3 under the Southwest Power Line Alternative. Based on the visual simulation prepared for KOP 3, the pole structures used for the power line would be vertical forms that extend above the surrounding vegetation. The overhead conductors that would span between the pole structures would also not be visible from KOP 3. The power line would contrast with the features in the existing landscape because there are no vertical lines visible from the KOP that are similar to those that would be introduced by the proposed pole structures. Although the vertical lines would be taller than surrounding vegetation, they would be viewed against much taller landforms. The landforms are generally various shades of brown in color. Because the proposed pole structures would be viewed against much taller components of the landscape that appear similar in color, the degree of contrast resulting from their addition would be minor.

The degree of contrast would not exceed moderate and would be compliant with the objectives of BLM VRM Class III and IV. The scenic quality of the existing landscape may be altered, but generally retained as the project components would not be expected to dominate the view of the casual observer. Thus impacts on visual resources during construction and operation would be moderate to minimal at KOP 3.

KOP 4

The degree of contrast and impacts associated with the proposed project would be the same for the Southwest Power Line Alternative as described for the Proposed Action for KOP 4. However, the contrast and impacts related to the proposed power line that would be visible from this KOP under the Proposed Action would not apply under implementation of the Southwest Power Line Alternative. The proposed power line would be constructed to follow the southwest alignment along U.S. Highway 50 and SR 379 under the Southwest Power Line Alternative. This alignment would not be visible from KOP 4.

The degree of contrast would not exceed moderate and would be compliant with the objectives of BLM VRM Class III and IV. The scenic quality of the existing landscape may be altered, but generally retained as the project components would not be expected to dominate the view of the casual observer. Thus impacts on visual resources during construction and operation would be moderate to minimal with mitigation measures employed.

4.14.4.1 Mitigation

Mitigation measures are the same as those described for the Proposed Action in Section 4.14.2.1.

4.14.4.2 Unavoidable Adverse Impacts on Visual Resources

Unavoidable adverse impacts on visual resources caused by the Waste Rock Disposal Site Design Alternative would be the same as those described for the Proposed Action.

4.14.2.3 Irreversible and Irretrievable Commitment of Resources

Irreversible and irretrievable commitments of visual resources would be the same as those described for the Proposed Action.

4.14.4.4 Relationship of Short-Term Uses and Long-Term Productivity

There are no known short-term uses of visual resources that would adversely affect the maintenance and enhancement of long-term productivity.

4.14.5 No Action Alternative

Under the No Action Alternative, the proposed project would not be constructed and there would be no associated project impacts on visual resources excluding those impacts that are the result of actions previously approved under the Midway Gold Pan Project Exploration Amendment Environmental Assessment (BLM, 2011b). This EA amended an existing Environmental Assessment (BLM, 2004c) that was approved in 2004. The amendment authorized an additional 75 acres of disturbance to develop a new access road, new drill pads, and new drill roads for a total of 100 acres of approved disturbance.

Impacts on visual resources from this approved action have been the result of visual disruption to the natural landscape resulting primarily from the construction of roads and pads. Impacts related to the construction of exploration roads and pads would be reduced once these areas

are reclaimed. Several years after reclamation has been completed, the visual impacts would be expected to be negligible if not eliminated entirely.

4.15 Recreation

4.15.1 Indicators

Impacts on recreation resources were evaluated by determining the potential for an alternative to result in:

- Conflicts with existing federal, state, and local recreation management plans and policies;
- Changes in access to existing recreation opportunities or areas; and
- Changes in levels of use of existing recreation areas.

For all alternatives, short-term impacts to recreation resources were considered those impacts that would occur throughout the life of the project (Section 2.3). Long-term impacts are those impacts that would occur beyond the life of the project.

According to Section 3.15, wilderness areas do not occur within or near the area of analysis for any of the alternatives. Impacts to wilderness areas would not be expected to result from implementation of any of the alternatives analyzed in this EIS, and are not discussed further.

4.15.2 Proposed Action

The Proposed Action would not conflict with the existing management objectives that are stated in the *Ely Proposed Resource Management Plan/Final Environmental Impact Statement* (BLM, 2007a). There would be no known conflicts with any state or local land use or recreation management plans and policies that are known to exist.

The Proposed Action would result in access restrictions to the entire project area, thus negatively affecting members of the public who would otherwise use the approximately 3,204 acres within the project area boundary for recreation. The impact would change the area available for dispersed recreational uses, but have no impact on developed recreation sites or facilities because they do not exist within the project area. The project area does not offer unique recreational opportunities that are not found elsewhere in the vicinity. There are large areas of public lands, BLM-administered or otherwise, that are located in the BLM Ely District but outside of the project area that provide the types of dispersed recreation opportunities found within the project area. The Proposed Action would have only slight changes in the area accessible for dispersed public recreation, and public access to the project area would be restored once reclamation is complete. Accordingly, the impact on recreation resources resulting from restricted access to the project area would be short-term and minor.

A certain percentage of the recreational users unable to access desired resources or opportunities within the project area would be anticipated to utilize other areas within the Ely District for dispersed recreation. The displacement of recreational users onto public lands outside of the project area would have an adverse impact on other recreational users that currently use these lands for dispersed recreation. Recreation users seeking recreation experiences of isolation and solitude while engaging in dispersed recreation would be most sensitive to increased levels of use in these areas. Public access to the project area would be permissible again once reclamation of the proposed project is complete. Changes in the level of use of public lands outside of the project area would be negligible because: 1) there are ample dispersed recreation opportunities elsewhere in the vicinity; 2) unique opportunities do not occur within the project area; and 3) relatively few users would be displaced onto nearby public lands. Accordingly, the impact on recreation resources related to displacement of users from within the project area would be negligible and short-term for the life of the project.

The portion of the area of analysis located within approximately four miles of U.S. Highway 50 is located within the Loneliest Highway SRMA (Figure 3.14-1). As stated above, public access would be restricted to the entire project area, which would therefore include the portion within the Loneliest Highway SRMA. The recreation destinations and attractions noted to be of particular popularity, such as Cold Creek Reservoir and the Garnet Hill rock hounding area (BLM, 2007a), are not located within the portion of the SRMA that the area of analysis occurs within. Public access to the project area would be restored once reclamation is complete. The impact of the Proposed Action on the Loneliest Highway SRMA would be short-term and negligible because changes in the accessible area or the level of use would not be easily measureable.

The quality of dispersed recreation on neighboring lands within proximity to the project area may be adversely affected by the visual disruption (Section 4.14) of the physical presence of the project within the landscape. Visual disruptions during the life of the project would change the area accessible to users that desire more primitive recreational experiences with little to no evidence of human modification to the natural landscape. Reclamation of the surface disturbance within the area of analysis would reduce the visual disruption that the Proposed Action would have beyond the life of the project. However, some components of the proposed project would remain somewhat visibly evident after reclamation is completed, such as the mine pits and the ET cells. Visual disruption that persists beyond the life of the proposed project would affect users within the project area as well, since the access would only be restricted for the life of the project. Human modifications to the natural landscape resulting from the Proposed Action would occur within a landscape that contains existing human modifications. The area of analysis either contains, or is located within close proximity to U.S. Highway 50, numerous unpaved roads, power lines, and several ranch structures. One or more of these existing modifications are visible from many areas of the neighboring lands that are located within close proximity to the area of analysis and from within the area of analysis. There are large areas of public lands located elsewhere in the BLM Ely District that are accessible for dispersed recreation uses and that provide primitive recreational experiences. The short-term and long-term impact that visual disruptions would have on recreation resources would be negligible

because changes in the area that are accessible for dispersed recreation opportunities would be minimal. Changes in the area that are accessible to users that seek primitive recreational experiences from dispersed recreation uses would also be minimal because the Proposed Action would occur within a landscape containing existing human modifications.

The quality of dispersed recreation on neighboring lands within proximity to the project area may also be adversely affected by increased noise levels during the life of the project. Increased noise levels would result from operation of project equipment and vehicles, and the active construction, operation, and reclamation of the proposed project. Increased noise from the Proposed Action would occur during the life of the project only. Much like the visual disruption of the proposed project, increased noise would reduce the area that is accessible to recreation users that desire more primitive recreational experiences with little to no sights or sounds of humans evident. As described above, the project area and surrounding lands are within close proximity to U.S. Highway 50 and numerous existing unpaved roads. Travel on these roads, particularly U.S. Highway 50, contribute to the existing ambient noise in the area. Therefore, existing ambient noise in the area is partially comprised of sounds from human activities. The Proposed Action would increase the volume of the ambient noise in the area, and increase the percentage comprised of sounds from human activities. The areas that would be affected by increased noise levels would be limited to those within closest proximity to the project area because project noise would attenuate as users move further from the project area. There are large areas of public lands located elsewhere in the BLM Ely District that are accessible for dispersed recreation uses and that provide primitive recreational experiences with little to no sounds of humans. Changes in the area that are accessible to users seeking primitive recreational experiences from dispersed recreation uses would be minimal because the lands within close proximity to the project area contain noise sources related to human activities, and because the existing landscape contains evidence of human modifications. The impact would be short-term and negligible.

Increased human activity and noise levels would likely displace mule deer, pronghorn antelope, and other game species from use of the project area and areas within close proximity to the project area. Displacement of wildlife from these areas would affect recreation resources by reducing the overall area available for hunting, which is the most common recreational use of the area. Displacement of game and non-game wildlife species would affect other recreation opportunities that are related to the presence of wildlife, such as bird-watching or photography. Public access to the project area would be restricted, which would also prevent hunting or any other recreational activities from occurring within the area. The impact that wildlife displacement and restricted access would have on hunting and other recreation activities related to wildlife would be short-term and negligible because: 1) the project area represents only a minor portion of the area open to hunting within Hunt Area 13; and 2) the displacement would not be expected to reduce the population sizes of game species that can be sustained in Hunt Area 13. Following reclamation, the project area would be accessible for recreation uses, including hunting. Reclamation vegetation would provide wildlife habitat, but it may differ from the types of habitat that existed prior to the proposed project. Thus, the wildlife species that use the project area after reclamation and their pattern of use within the project area may change. This change

would be a long-term impact on recreation resources that is negligible. See Section 4.8, Wildlife, for more detailed information pertaining to the potential impacts on wildlife and wildlife habitat.

4.15.2.1 Mitigation

Additional mitigation measures are not required.

4.15.2.2 Unavoidable Adverse Impacts on Recreation

Adverse impacts from the Proposed Action would include the direct short-term loss of public access to the approximately 3,204 acres and the dispersed recreation opportunities it provides. In addition, there would be an indirect adverse impact to other recreational users from the displacement of recreational users, directly affected by restricted access, onto adjacent public lands. Following reclamation, public access to the project area would be restored, and recreational use of the area would return to existing conditions.

The visual disruption of the placement of the proposed project within the landscape and increased noise levels from operation of the proposed project would have an indirect adverse impact on recreation resources. The impact resulting from the visual disruption of the proposed project would affect the recreation opportunities and uses on lands within proximity to the area of analysis for the life of the project. The impact resulting from increased noise would affect areas within proximity to the area of analysis during construction of the proposed project, and areas within proximity to the project area during operation of the proposed project. Impacts resulting from increased noise would persist during the life of the project; noise levels would return to existing conditions following reclamation activities. The visual disruption would be less apparent following reclamation, but would also affect the recreation resources within the project area.

4.15.2.3 Irreversible and Irretrievable Commitment of Resources

Irreversible and irretrievable commitments of recreation resources would not be expected as a result of the Proposed Action.

4.15.2.4 Relationship of Short-Term Uses and Long-Term Productivity

Most impacts on recreation resources would be short-term for the life of the project, but impacts resulting from the visual disruption would persist beyond the life of the project. Reclamation measures would be applied to areas affected by the proposed project and would reduce the intensity of the impacts related to the visual disruption of the proposed project. The impacts that would persist following reclamation would be negligible and the long-term productivity of the area of analysis to provide dispersed recreation opportunities would not be diminished.

4.15.3 Waste Rock Disposal Site Design Alternative

The impacts associated with the construction, operation, and maintenance of the Waste Rock Disposal Site Design Alternative would be the same as those described for the Proposed Action, except it would result in approximately 79 fewer acres of disturbance.

4.15.3.1 Mitigation

Additional mitigation measures are not required.

4.15.3.2 Unavoidable Adverse Impacts on Recreation

Unavoidable adverse impacts on recreation resources caused by the Waste Rock Disposal Site Design Alternative would be the same as those described for the Proposed Action, except it would result in approximately 79 fewer acres of disturbance..

4.15.3.3 Irreversible and Irretrievable Commitment of Resources

Irreversible and irretrievable commitments of recreation resources would not be expected as a result of the Waste Rock Disposal Site Design Alternative.

4.15.3.4 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term uses and long-term productivity associated with the Waste Rock Disposal Site Design Alternative would be the same as the relationship described for the Proposed Action.

4.15.4 Southwest Power Line Alternative

Although this alternative would require placement of the new transmission line in areas where the Proposed Action would otherwise not. However, the project area and proposed project would be visible from these areas under either alternative. Accordingly, the adverse effects to the quality of dispersed recreation related to the visual disruption of the physical presence of the project within the landscape would be the same under the Southwest Power Line Alternative as described for the Proposed Action. The Southwest Power Line Alternative would be expected to result in impacts on recreation resources that are the same as those described for the Proposed Action.

4.15.4.1 Mitigation

Additional mitigation measures are not required.

4.15.4.2 Unavoidable Adverse Impacts on Recreation

Unavoidable adverse impacts on recreation resources caused by the Southwest Power Line Alternative would be the same as those described for the Proposed Action.

4.15.4.3 Irreversible and Irretrievable Commitment of Resources

Irreversible and irretrievable commitments of recreation resources would not be expected as a result of the Southwest Power Line Alternative.

4.15.4.4 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term uses and long-term productivity associated with the Southwest Power Line Alternative would be the same as the relationship described for the Proposed Action.

4.15.5 No Action Alternative

Under the No Action Alternative, the proposed project would not be constructed and there would be no associated project impacts on recreation resources excluding those impacts that are the result of actions previously approved under the Midway Gold Pan Project Exploration Amendment Environmental Assessment (BLM, 2011b). This EA amended an existing Environmental Assessment (BLM, 2004c) that was approved in 2004. The amendment authorized an additional 75 acres of disturbance to develop a new access road, new drill pads, and new drill roads for a total of 100 acres of disturbance.

Impacts to recreation resources from this approved action have been the result of visual disruption to the natural landscape, increased noise levels during drilling and construction of roads and pads, and restriction of public access from drilling pads during active drilling. Impacts related to increased noise and access restrictions would not persist following reclamation of the areas affected by this approved action. Following reclamation, the intensity of the impact resulting from the disruption of this approved action would be reduced.

4.16 Socioeconomics

4.16.1 Indicators

This section presents an analysis of the potential socioeconomic impacts associated with the two phases of Midway construction, and operations, maintenance, and reclamation. The analysis considered impacts of the Proposed Action on White Pine County, Eureka County (with specific detail given to the town of Eureka), and the Duckwater Shoshone Reservation in Nye County. These areas (hereafter referred to as the "affected area") were selected for in-depth analysis of social and economic impacts, as most of the construction, operations, and maintenance employees, as well as supporting industries, would be located in these areas. Although Duckwater is in Nye County, it was included as part of the affected area, as there are limited opportunities for jobs in that community and a mine within a reasonable commuting distance would provide a viable source of jobs for Duckwater residents.

The social and economic characteristics of the affected area were analyzed to determine the potential effects of the Proposed Action and the alternatives on employment, population, income, housing, and services. Fiscal impacts were determined using information from Midway. Where possible, the economic and social effects of the Proposed Action were quantified. When quantification was not possible, the analysis included a qualitative discussion of possible effects and potential issues.

The economic impacts of constructing and operating the mine were estimated using Regional Industrial Multiplier System (RIMS II), an input-out model developed by the BEA, a division of the United States Department of Commerce. These types of regional economic models are standard approaches to: (1) measuring linkages between businesses, households and

institutions, and; (2) providing estimates of the multiplier effects that are associated with a direct stimulus or investment.

RIMS II multipliers are the sum of direct, indirect and induced effects divided by the direct impacts. These impact types are defined below:

> **Direct Impacts:** The initial investment or spending within a geographic region is defined as the direct effect. During the construction phase, the direct effects include construction employment, and local spending for construction-related services, supplies and materials.
>
> **Indirect Impacts:** The inter-industry impacts that measure the economic effects associated with the directly impacted industries selling and purchasing goods and services to and from other industries are the indirect impacts or effects. The indirect impacts associated with construction include industries located in the counties within the affected area that support the construction activity such as engineering design and architectural services, wholesale and retail trade purchases.
>
> **Induced Impacts:** The effects of increased consumer and household spending that result from the direct and indirect income changes are the induced impacts.

This analysis estimated the total economic impacts (direct, indirect, and induced) associated with constructional and operational phases of the Midway Gold Mine. The construction analysis included the impact of construction worker spending in the affected area, as well as construction purchases for supplies and materials made from local businesses. The operations phase analysis was based on wages paid to mine employees. The effects that were measured for both phases of the project include employment (full-time and part-time jobs) and labor income (wages, salaries, and bonuses) paid to these workers. Information used in developing the estimates was provided by Midway.

4.16.2 Proposed Action

4.16.2.1 Economic Impacts

Construction

Project construction would take between six and nine months, depending on weather conditions, and would require approximately 160 skilled and unskilled workers over the construction period. The number of workers at the job site would be expected to grow slowly, peaking within the final two months of the construction period.

To the extent possible, the staffing for the construction phase would draw from the existing construction workforce in the affected area; however, Midway expects that a large share of skilled trades (electricians, plumbers, heavy equipment operators) would be drawn from outside the affected area, most likely from Elko but possibly from as far away as Las Vegas. These workers would be hired through trade groups, and would stay in the affected area for short periods in temporary housing.

General labor needed for the project would be supplied by the construction contractor and would include a combination of local residents and workers residing outside of the affected area. Midway estimates that 20 percent of the construction labor force (32 jobs) would be supplied locally with the remaining workers (128) traveling from outside of the area. These workers would either relocate temporarily or stay in temporary housing in Ely, Ruth, McGill, Lund or Eureka. It is not anticipated that migrant construction workers would stay on the Duckwater Shoshone Reservation.

Construction employees would work a 10-day on, 4-day off shift. The total cost of construction for the Proposed Action is estimated to be approximately $70 million. Material and equipment purchases are expected to be $57.2 million, of which, seven percent would be spent locally (primarily in White Pine County). Labor-related costs would total almost $12.7 million, which includes per diem and living allowances. Midway estimates that 40 percent of this amount would be spent in the affected area.

The economic impacts generated by construction spending in the affected area during the construction period are summarized in Table 4.16-2.

Table 4.16-1 Economic Impacts of Midway Gold Mine Construction

	Total Spending	Local Spending	Job Impacts	Labor Income Impacts
Material/Equipment	$57,237,365	$4,006,616	18.3	$911,905
Labor-related Spending	$12,681,335	$5,072,534	58.4	$3,327,963
Total	**$69,918,700**	**$9,079,150**	**76.7**	**$4,239,898**

Note: RIMS II employment impacts include both full-time and part-time employment.

During the construction period, spending in the affected area would support almost 77 jobs and generate $4.2 million in income for area residents. The top industries benefitting from the increased employment and spending would be construction, retail trade, food services, drinking establishments, and accommodations.

Construction employment and the income generated by construction would have a beneficial, major, and short-term impact for residents and businesses located in the affected area. The project would be beneficial for area residents because it would provide new construction jobs, as well as support jobs in other industry sectors in the area. The effects to businesses and local governments would be beneficial, moderate and short-term. Businesses would benefit from purchases made by construction workers, and material and equipment purchases made by Midway.

Operations, Maintenance, and Reclamation

The annual operations and maintenance workforce for the Proposed Action would consist of 150 full-time employees over the 13-year active mining period. Reclamation and post-closure monitoring would extend the life of the project to approximately 28 years; however, reclamation

and post-closure employment would be substantially lower than during the active mining period. The impacts of reclamation and post-closure have not been quantified.

Total annual payroll for the Proposed Action is projected to be $11.5 million and includes benefits and incentive pay in addition to wages and salaries. Hiring for operations would run concurrent with construction. Initial employment would include 30 people who are currently Midway employees; 25 of these people already live in the affected area.

Midway would begin hiring and training workers for operations at the onset of construction and expects to be fully staffed when construction is complete. Midway intends to target as many employees as possible from the affected area and expects to fill all unskilled trades with people already living in the area. Some number of workers could be hired from residents of the Duckwater Shoshone tribe living on the Duckwater Reservation. Although there is no unemployment rate for the Reservation, Tribal Council Member Sanchez believes there are current residents who would welcome a job at the Mine and some tribal members living off the reservation who may relocate to the Reservation if mining jobs were available. However, the low unemployment in Eureka and White Pine counties combined with the area's small population base would require Midway to recruit some workers from outside of the affected area. Midway estimates that about 48 percent of the mine's operation workforce would come from outside of the area, with the remaining 52 percent coming from Ely, Ruth, McGill, Lund, Eureka and the Duckwater Reservation.

At full operation, Midway anticipates that 75 percent of mine employees (113 employees) would reside in White Pine County, Eureka County (primarily in Eureka) and the Duckwater Reservation. These employees would receive an estimated $7.9 million annually in wages and salaries. The remaining 37 mine employees would live outside of the affected area and would either commute to the job site on a daily basis or maintain a residence outside of the affected area and stay in temporary housing during their shifts.

Employment estimates were run through the RIMS II model to generate the direct, indirect and induced impacts of the operations on the affected area. The RIMS II model estimated that the project operations would support or create 176 jobs and generate almost $12.1 million annually in labor income for residents in the affected area. This includes 113 direct jobs held by residents of White Pine County, Eureka County, and the Duckwater Reservation and 63 indirect and induced jobs in other businesses located in the affected area. Given the amenities and business structure in the affected area, most of these indirect and induced jobs would likely by in White Pine County.

Table 4.16-3 summarizes these RIMS II-estimated increases in annual jobs and annual income that would result from mining operations. The impacts on jobs and income are conservative estimates as they are based solely on the wages paid to workers who live in the affected area. Although some of the wages paid to non-resident workers would likely be spent in the affected area, the amount of that spending is unknown and was not included in the analysis.

Table 4.16-2 Annual Economic Impacts of Midway Gold Mine Operations

Impact Type	Jobs	Labor Income*
Direct	113	$7,940,132
Indirect	46	$3,564,325
Induced	17	$595,510
Total	**176**	**$12,099,967**

Note: RIMS II employment impacts include both full-time and part-time employment.
*2012 dollars

It is not possible to determine whether the portion of the workforce that immigrated to the affected area during the operations and maintenance of the mine would relocate or remain in the area upon being terminated due to the closure and abandonment of the mine.

The Midway Mine operations would create major, long-term positive impacts on the economies of White Pine and Eureka counties and the Duckwater Reservation. Mine operations would result in beneficial, long-term impacts for individuals seeking stable employment as the mine would provide long-term employment and income throughout the life of the Proposed Action.

4.16.2.2 Social Impacts

Population

Construction

It is anticipated that 20 percent of the construction workforce would be drawn from the affected area. Most of the skilled trades would commute to the jobsite from outside the affected area and stay in surrounding communities for very short periods. Other skilled and unskilled workers would be drawn from outside the area. A few of these workers would be hired by Midway and trained for operations jobs. The remaining construction workers would likely remain transient; that is, commuting to the jobsite, staying in temporary housing and returning to their residences outside the affected area when their work is complete.

Given the short duration of the construction period, Midway does not expect that non-resident construction workers would relocate to the affected area unless they are subsequently hired by Midway for operations. Thus, any impacts on population during the construction period are expected to be negligible and short-term, and are addressed in the operations analysis.

Operations, Maintenance, and Reclamation

Mining operations would affect the population within the affected area. The Proposed Action would require a total of 150 workers, some of whom would relocate to White Pine or Eureka counties. To the extent possible, Midway would hire local residents to work at the mine. The current expectation is that 52 percent of the operations employees would be drawn from the affected area and 48 percent recruited from other communities.

When the mine is fully operational, Midway expects that 75 percent of its employees (113 people) would reside in the affected area and 25 percent (37 people) would commute from

outside of that area. This includes daily commuters (workers who live in communities outside of the affected area and travel to the mine each day) and weekly commuters (workers who maintain a residence outside the affected area, live in temporary housing during the week and return home at the end of their shift). The number of commuters may diminish over time depending on the availability of housing and other amenities in the area.

Although the household characteristics of the operations and maintenance workforce migrating to the affected area are not known, the prospect of long-term employment might attract some share of married workers who choose to relocate their spouses and children to the area. The possibility of work at the mine may also result in some population increase on the Duckwater Reservation as tribal members relocate to the Reservation when mining jobs become available.

The upper-bound population effects have been estimated using the national average family size to calculate the number of additional family members that might accompany direct in-migrating workers. Based on the 2010 Census, the average family size in the United States in 2010 was 3.14. Assuming that all in-migrating workers bring families and the average family size is 3.14, the total direct effect on population would be an increase of 116 people. It is expected that most of the migrating families would locate in either White Pine County or Eureka; however, some of the population increase could result from members of the Shoshone Tribe who are currently living elsewhere, moving the Duckwater Reservation to take advantage of job opportunities presented by mining operations.

The immigration of 116 people to the area during the operations and maintenance phase of the Proposed Action would increase the population of the affected area by less than 1.0 percent. This would be the upper-bound estimate. The lower-bound estimate assumes that all 37 workers who relocate to the area would be single-status workers.
The operations and maintenance phases of the Proposed Action would result in a slight increase in population under the upper-bound assumption and a negligible increase under the lower-bound assumption. The impacts under both assumptions would be long-term, but it is unknown whether these impacts would be eliminated upon mine closure and abandonment due to the relocation of terminated mine employees.

Housing

Construction

Based on construction workforce estimates and residency assumptions described above, 128 workers would commute to the affected area during construction. The majority of these would be transient, single-status workers. These workers would require temporary housing during their stay. Temporary housing accommodations could include hotels, motels, recreational vehicles, mobile homes, or apartment rentals. Currently, the availability of all such resources in the affected area is limited. During peak summer travel and during the work week, hotels, motels, and RV parks in the affected area routinely report full or near full occupancy (Damele, 2012; Garza, 2012).

Housing demand generated by an influx of construction workers could exceed the temporary housing resources in the area, potentially causing an increase in temporary housing costs and creating a hardship on renters with fixed incomes.

Occupancy of hotel rooms during construction could also impact tourism in White Pine and Eureka, both of which have put considerable resources into developing a tourism and recreation sector. Tourists and recreationists may choose not to visit the area if accommodations are unavailable or are considered too expensive.

It is unlikely that housing in Duckwater would be affected during construction. Duckwater's distance from the project area and virtual lack of rental property would likely deter temporary construction workers from seeking temporary housing in that community.

The degree of construction impacts on the affected area ranges from minor to moderate, and impacts could be both beneficial and adverse. Price increases might be perceived as beneficial for property owners, but be perceived as adverse by recreationists and renters living on fixed incomes. The impacts would be temporary, ending in six to nine months when the construction phase is complete.

Operations, Maintenance, and Reclamation

Given the 13-year mine life, and 15-year project life, including construction and reclamation, of the Proposed Action, operations workers are likely to prefer conventional housing resources (single-family homes, multifamily residences, and apartments). Although the population impacts are small (37 direct employees), there is a housing shortage in both White Pine and Eureka counties. At present, the housing stock on the Duckwater Reservation is sufficient to meet the needs of the Tribe's population (Sanchez, 2012).

Based on a recently completed housing study for White Pine County, there is a current housing gap of 137 units in the county. Area employers have raised concerns about the lack of adequate housing for new employees and the corresponding impact on their ability to recruit and retain workers (Section 3.16). Contractors in the area have expressed interest in developing housing in the Ely area but no construction is underway (Garza, 2012).

Until recently, the housing situation in Eureka was similar to that in White Pine County. Despite the large number of unoccupied units reported in the 2010 Census, there were few units available for purchase or rent in southern Eureka County. Very few rental properties have been available and those that become available are generally filled quickly. Many of the vacant properties in the area are not listed for sale or rent and the owners have chosen not to rent or sell (Damele, 2012; Mears, 2012).

Eureka County has recently taken measures to increase housing in Eureka Township. The county is working with various entities to develop the Eureka Canyon subdivision, a 164-acre residential community located off U.S. Highway 50, south of the Eureka County Fair Grounds. This subdivision would initially offer 50 multifamily units and 30 single-family lots. Future

development in the subdivision is possible but would be dependent on future demand. It is reasonably foreseeable that more housing would become available in Eureka within the near future which would accommodate the relocation of mining employees.

Housing on the Duckwater Reservation is available and sufficient to meet the needs of tribal members living there.. Given Duckwater's remote proximity to the project area, its limited inventory of amenities, and its lack of housing, it is not anticipated that the migrating operations employees would relocate to Duckwater unless they are members of the Shoshone Tribe who want to live on the reservation. A likely scenario would be that employees who are current residents of Duckwater would commute to the mine on a daily basis. Any increased demand for housing would be addressed by the Tribe through available housing programs (Sanchez, 2012).

The operations and maintenance phases of the Proposed Action would result in some increased demand for housing in the affected area, most likely in either Ely or Eureka. While adequate housing may be available with the development of units in Eureka Canyon, it is impossible to determine whether mine employees would choose to live there.

The impact of operations and maintenance on housing would be minor to moderate since the number of workers that are expected to relocate to the area is small. If this migration fuels development of additional housing, the effect could be potentially beneficial depending on the level of investment and economic opportunities generated in response to housing demand. These effects would be long-term; however, they may be annulled if the immigrating employees choose to leave the affected area upon abandonment of the mine.

Community Services

Effects to community services are described in this section. Although most county functions and community services would experience some increase in demand during the construction and operations, it is likely to be focused on key services including law enforcement and emergency response, fire protection, health and social services, water supply, solid waste, and education.

Law Enforcement and Emergency Response

Construction

Workforce commuting, combined with a temporary influx of construction workers and potential increase in crime in the area, could create a temporary increase in demand for traffic control, law enforcement and accident response during construction.

The White Pine County Sheriff's Office is responsible for law enforcement throughout the county, which would include the mine site. White Pine County has seen an increase in the crime rate during construction activities which drop sharply when the construction workforce leaves the county. However, a large share of the construction workforce would be only in the affected area for short periods of time, which would reduce the number of incidents requiring law enforcement intervention. It is not anticipated that law enforcement services provided by the Duckwater Reservation's Sheriff Department would increase during either the construction or operations and maintenance phases of the project.

Calls for emergency response could increase over current levels during the construction phase as workers travel to the mine. Midway would add an ambulance to their incident management plan to help deal with the potential increased need for emergency services. In addition, Midway would have a trained mine rescue team at the site to minimize delays in extrication, recovery, and transportation of personnel injured at the mine.

Operations, Maintenance, and Reclamation
As operations begin, the demand on law enforcement would be similar to current demand as the impact on population would be negligible. However, increased traffic on U.S. Highway 50 from Ely or Eureka Township to the project area and on SR 379 could require increased traffic enforcement and accident response from providers in both White Pine and Eureka counties.

Calls for emergency response could also increase over current levels during the operations and maintenance phase but would drop to current levels upon mine abandonment if immigrated workers choose to relocate.

Fire Protection
Construction
Fire protection services in White Pine County and Eureka County are staffed with a combination of paid firefighters and volunteers. Duckwater Reservation has a volunteer fire department. The closest fire station to the project area is in Eureka, which may be called to respond to fire incidents and accidents at the mine. As an all-volunteer fire department, an increase in the number of incidents would likely strain the resources of the fire station in Eureka and potentially the Duckwater Reservation.

Fires at the mine site have the highest likelihood of increasing the need for fire protection services. Midway would install a fire-suppression water system to provide service to buildings, and would have fire-suppression equipment on-site. The company may also equip the mine water truck with equipment to serve as a fire truck.

Operations, Maintenance, and Reclamation
The impacts on fire protection services during the operations and maintenance phase of the Proposed Action would be the same as the impacts during the construction phase.

Health Care and Social Services
Construction
Health care and emergency services are available at the William Bee Ririe Hospital (which includes an out-patient clinic) in Ely, the Eureka Medical Clinic in Eureka Township and medical clinic on the Duckwater Reservation. Transient construction workers are most likely to use the facilities in Ely and Eureka for minor emergencies and urgent care, while seeking service in their home communities for elective and routine care. It is not anticipated that the transient construction workforce would utilize medical services on the Duckwater Reservation.

Minor emergency services and urgent care needed by the construction workforce could be provided at the Eureka Medical Clinic or William Bee Ririe Hospital/Clinic without additional staffing. All facilities exceed the rural health care staffing standard of one physician per 1,500 people. Routine medical care associated with the construction workforce would not pose a problem.

The availability of construction jobs could attract job seekers to the affected area, some of whom may arrive with few resources. Midway would attempt to recruit workers from the White Pine County and Eureka area, but cannot control the flow of interested job applicants into the area. Social service providers in White Pine County and Eureka could see an increase in indigent individuals seeking assistance during the construction phase of the project. Additional social services staff might be needed during the construction period. This demand would likely diminish soon after construction ends.

Operations, Maintenance, and Reclamation
The additional population associated with the mine's operations would increase demand for health care services in the affected area; however, the projected increase in population is insufficient to warrant the addition of health care workers or support staff at any of the facilities. Mine employees would have health insurance which would offset the cost of services and generate revenue for indigent health care in the area.

Given the relatively high wages anticipated for mine operations workers, combined with the small population impact and the fact that operations workers would have health insurance, the operations phase of the Proposed Action is not expected to significantly increase the caseloads of social service providers in the area.

Water and Solid Waste
Construction
The mine would satisfy its water needs through wells located at the job site. Adequate water rights have been secured to meet these needs. Therefore, water demands generated from the construction of the mine and from construction labor would not impact existing community water systems.

Waste generated during construction and operations at the mine would be disposed of by Midway in landfills it would construct and maintain. No waste from the project would be taken to the Whiskey Flats Landfill in Eureka County, or the Regional Landfill in White Pine County.

During construction, Midway expects that workers would stay in existing developed housing (hotels, motels, private residences, trailers, and apartments) and RV parks, which have established water supplies.

Operations, Maintenance, and Reclamation
Sufficient water supply exists in Ely and Eureka Township to serve a larger population. The effects of mine operations on population range from negligible to minor, so existing capacities of

the water utilities in Ely and Eureka would be adequate to meet the slight increase in demand. The water resources of the Duckwater Reservation are adequate to serve existing needs of the Tribal population and could accommodate modest population increases.

Education

Construction

An estimated 128 non-resident workers would commute to the affected area for short periods of time over the six- to nine-month construction period. The majority of these workers would be transient, maintaining permanent residences elsewhere and traveling without families, therefore, there would be little, if any burden on the local school systems in either county.

Operations, Maintenance, and Reclamation

More than half of the operations employees are expected to be local residents. Their children would already be enrolled in the local schools. Workers with families relocating to the Duckwater Reservation could impact the school system in the town Eureka as some school children from the Reservation commute to schools in Eureka. Although some workers who relocate to the area may bring school age children, the estimated population effects are minor; therefore, it is unlikely that measureable numbers of additional school age children would join the community as a result of operations. Operation of the mine would have a negligible, long-term impact on local schools.

Mine construction would have a short-term, negligible to minor effect on community services within the affected area. Mine operations, maintenance, and reclamation would also have a negligible to minor effect on community services within the affected area; however, these effects would be repealed if workers relocate after mine abandonment.

4.16.2.3 Fiscal Impacts

The estimates presented in this analysis are based on information provided by Midway. As such, they are subject to change as the project proceeds and commodity prices fluctuate. However, the estimates are a reasonable assessment of the tax revenues that would flow from the project.

Sales Tax Receipts

Both the construction and the operation, maintenance, and abandonment phases of the mine would generate an increase in sales and use tax receipts. Purchases of equipment, supplies and construction materials needed by the Proposed Action would be subject to sales tax as would consumer purchases by the construction workforce.

Detailed estimates of the taxable purchases made in the affected area by the mine and construction workforce cannot be quantified at this time, but Midway has estimated it would pay a total of $15.1 million in sales and use tax during construction and operations. Some portion of this amount would accrue to White Pine County and Eureka County school districts located in those counties, and other taxing entities in each county. Midway could also purchase some goods and services from businesses located on the Duckwater Reservation.

Property Taxes

Property taxes paid by Midway would be a function of capital investments in plant and equipment, and would accrue to taxing entities in White Pine County. Based on current tax rates, general property tax revenues have been estimated by Midway to be $9.8 million over the first eight years of operation. The expected distribution of those property taxes, by taxing entity, is shown in Table 4.16-4.

Table 4.16-3 Estimated Property Tax Liabilities for the Pan Mine

Taxing Entity	Tax Rate	Allocated Property Tax
General Fund	1.5508	$4,152,415
Emergency Medical Service	0.0350	$93,716
Senior Citizen Center	0.0500	$133,880
Accident Indigent	0.0150	$40,164
Agriculture District #13	0.0350	$93,716
Agriculture Extension	0.0100	$26,776
China Springs Youth Facility	0.0052	$13,923
County Indigent	0.1000	$267,760
State of Nevada Indigent	0.1000	$267,760
Capital Improvements	0.0500	$133,880
Total County	**1.9510**	**$5,223,989**
White Pine School District – Operating Fund	0.7500	$2,008,197
White Pine School District – Debt	0.2490	$666,721
Total School	**0.9990**	**$2,674,918**
Hospital	0.5400	$1,445,902
State	0.1700	$455,191
Total	**0.7100**	**$1,901,093**
GRAND TOTAL COUNTY	**3.6600**	**$9,800,000**

Source: Midway, 2012

New residential and commercial development built to accommodate growth in the affected area resulting from the operation of the mine would also contribute to the area's tax base. However, projections of such revenues cannot be reasonably quantified due to uncertainties regarding housing type, values, and location of the developments.

Net Proceeds Taxes

Ad valorem taxes would be levied on the net proceeds of mining (NPM), which are a function of production, costs of recovery and processing, market prices and variable tax rate. Projected NPM taxes over the life of the mine have been estimated by Midway based on two gold price assumptions. At $1,200 per ounce, projected NPM taxes total $18.1 million over the life of the project. An estimated $13.3 million of this total would accrue to White Pine County. At $1,550 per ounce, projected NPM taxes total $28.9 million over the life of the project. An estimated $21.2 million would accrue to White Pine County. The estimates shown here are based on specific commodity prices and would change with fluctuations in the price of gold.

The Proposed Action would result in substantial long-term increases in revenues in the affected area, the largest share of which would accrue to White Pine County and taxing entities within the county.

Payments in Lieu of Taxes

Under the Proposed Action, Midway would utilize BLM land. Because there would be no transfer of federal land, there would be no direct effect on the amount of land used in estimating PILT for White Pine County.

Construction of the mine would have a major, positive, short-term fiscal effect on the entities within the affected area.

The operation and maintenance of the mine would also have a major, positive effect. This effect would be long-term, but would cease upon mine closure and abandonment.

4.16.2.4 Mitigation

Additional mitigation measures are not required.

4.16.2.5 Unavoidable Adverse Impacts on Socioeconomic Resources

During the construction phase, there would be a temporary influx of construction workers. The temporary impacts caused by a small increase in population of the affected area would subside once the construction is complete and most of the workers leave.

The operations phase of the project would result in long-term, but negligible population growth in the project area. This population growth could strain existing housing resources in White Pine and Eureka counties and potentially the Duckwater Reservation.

4.16.2.6 Irreversible and Irretrievable Commitments of Socioeconomic Resources

Under the Proposed Action, the social and economic structure of White Pine and Eureka counties and the community of Duckwater would not be significantly altered.

4.16.2.7 Relationship of Short-Term Uses and Long-Term Productivity

Under the Proposed Action, short-term uses would involve labor and purchases of construction materials and services from local businesses. Because these uses would be temporary, they do not interfere with the long-term economic and social stability of the area.

4.16.3 Waste Rock Disposal Site Design Alternative

4.16.3.1 Economic and Social Effects

The Waste Rock Disposal Site Design Alternative would result in the same types of impacts as described under the Proposed Action.

4.16.3.2 Mitigation

Additional mitigation measures are not required.

4.16.3.3 Unavoidable Adverse Impacts on Socioeconomics

Unavoidable adverse impacts on socioeconomics would be similar to those described under the Proposed Action.

4.16.3.4 Irreversible and Irretrievable Commitments to Socioeconomic Resources

Irreversible and irretrievable commitments to socioeconomic resources would be similar to those described under the Proposed Action.

4.16.3.5 Relationship of Short-Term uses and Long-Term Productivity

Short-term uses and long-term productivity would be similar to that described under the Proposed Action.

4.16.4 Southwest Power Line Alternative

4.16.4.1 Economic and Social Effects

Under the Southwest Power Line Alternative, all economic and social effects in the affected area would be the same as the Proposed Action with the exception of effects related to construction. Construction of additional miles of transmission line could result in additional construction costs and a longer construction period which could exacerbate the construction-related social and economic impacts described under the Proposed Action.

4.16.4.1 Operations, Maintenance and Reclamation

The impacts of operations, maintenance and reclamation under the Southwest Power Line Alternative are the same as those under the Proposed Action.

4.16.4.2 Unavoidable Adverse Impacts on Socioeconomics

Unavoidable adverse impacts on socioeconomics would be similar to those described under the Proposed Action.

4.16.4.3 Mitigation

Mitigation for the Southwest Power Line Alternative would be similar to that of the Proposed Action.

4.16.4.4 Unavoidable Adverse Impacts on Socioeconomics

Unavoidable adverse impacts from the Southwest Power Line Alternative would be the same as for the Proposed Action.

4.16.4.5 Irreversible and Irretrievable Commitments of Socioeconomic Resources

The irreversible and irretrievable commitments of socioeconomic resources under the Southwest Power Line Alternative would be the same as for the Proposed Action.

4.16.4.6 Relationship of Short-Term Uses and Long-Term Productivity

The relationship of short-term uses and long-term productivity for the Southwest Power Line Alternative would be the same as for the Proposed Action.

4.16.5 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be built. The social and economic effects discussed in this EIS would not occur. However, Midway is currently authorized to conduct up to 75 acres of additional surface disturbance to develop a new access road and construct additional drill pads and drill roads. These activities would continue.

4.17 Environmental Justice

4.17.1 Indicators

Each of the alternatives considered in this EIS was analyzed for its potential to result in an adverse impact on environmental justice. An alternative was considered to have an adverse impact on environmental justice if it would result in:

- Disproportionately high and adverse human health or environmental effects on minority populations or low-income populations;
- Increased risk or rate of exposure to an adverse environmental hazard by a minority population or low-income population that appreciably exceeds the risk or rate of exposure to the general population; or
- Health and safety hazards that disproportionately affect children.

The following factors were considered to determine whether the potential environmental effects of an alternative are disproportionately high and adverse:

- Whether an impact would be likely on the natural or physical environment that significantly and adversely affects a minority population or low-income population; and
- Whether environmental effects would have a significant adverse impact on minority populations, low-income populations, or children that would appreciably exceed those on the general population.

Impacts relating to environmental justice were evaluated in terms of intensity and context; however, there is no standard set of criteria established for evaluating environmental justice impacts. The No Action Alternative would represent a continuation of the current environmental justice issues that exist within the area of analysis. Accordingly, the No Action Alternative was used as the basis of comparison for categorizing the intensity of the potential impacts of the other alternatives that were analyzed. The intensity of potential impacts of the other alternatives was interpreted in terms of either "major", "moderate", "minor", or "negligible" based on a comparison with the No Action Alternative. The following are standard definitions for these terms:

- A negligible impact is at the lower level of detection, and the only change to environmental justice issues relative to the No Action Alternative would be of no consequence;

- A minor impact is slight but detectable, and changes to environmental justice issues relative to the No Action Alternative would be of small magnitude;

- A moderate impact is readily apparent, and there would be a permanent measurable change to environmental justice issues relative to the No Action Alternative; and

- A major impact would be highly noticeable, and there would be a permanent measurable change to environmental justice issues relative to the No Action Alternative.

Impacts were analyzed in context with the population residing within the area of analysis, which includes Eureka County and White Pine County, Nevada. Impacts were also analyzed in context with populations of the Eureka Census Designated Place (i.e., town of Eureka) and the city of Ely because these are the major population centers nearest to the project area. Short-term and long-term impacts were analyzed. Data provided by the U.S. Census Bureau (2011a and 2011b) was used to quantify and identify the populations within these contexts.

4.17.2 Proposed Action

The area within the immediate vicinity of the project area is sparsely inhabited with residents of several scattered ranches being the only population. The nearest population center to the project area is the town of Eureka, which is located approximately 16 road miles northwest of the area. According to Section 3.17 of this EIS, the population of the town of Eureka is not comprised of an unusually high percentage of persons considered to be of a minority or low-income population.

The next nearest population center is the city of Ely, which is located approximately 60 miles east of the project area. Per Section 3.17 of this EIS, the population of the city of Ely is not considered a minority population or a low-income population. Additionally, the environmental effects that typically extend to the farthest distances from mining activities, such as effects on air quality, would be anticipated to disperse between the project area and the city of Ely. Thus, the population within the city of Ely would not be disproportionately affected by any environmental effects. The effects would instead impact the collective population of White Pine County approximately equally, without regard to race, ethnicity or income level.

According to Section 3.17 of this EIS, the populations of Eureka and White Pine counties are not considered minority populations per the conditions specified in the *Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses* (EPA, 1998). Additionally, Section 3.17 of this EIS indicates that the population of each county is not considered to be a low-income population.

No traditional cultural properties or EO 13007 sites (i.e., Indian Sacred Sites) have been identified within the project area, according to Section 3.17 of this EIS. To date, no specific concerns about the proposed project have been raised by any of the Native American Tribes that were invited to enter into consultation for the Proposed Project. Therefore, there are no known impacts associated with the Proposed Action on traditional Native American concerns.

The Proposed Action would not result in a disproportionate effect on a minority population or a low income population. The Proposed Action is unlikely to place an undue burden on children because the area surrounding the project area is remote and few, if any, children live or have reason to congregate in the area. Because there is no disproportionate effect on an identified minority or low-income population, or on children that would be expected as a result of the Proposed Action, impacts on environmental justice issues would not be anticipated.

4.17.2.1 Mitigation

Additional mitigation measures are not required.

4.17.2.2 Unavoidable Adverse Impacts on Environmental Justice

There would be no unavoidable disproportionate impacts on minority or low-income populations.

4.17.2.3 Irreversible and Irretrievable Commitments of Resources

There would be no irreversible and irretrievable commitments of resources.

4.17.2.4 Relationship of Short-Term Uses and Long-Term Productivity

Short-term uses would not impact long-term economic or social stability of minority or low-income populations in the area of analysis.

4.17.3 Waste Rock Disposal Site Design Alternative

The impacts of the Waste Rock Disposal Site Design Alternative would be the same to those described for the Proposed Action. Thus, this alternative would not be expected to have any impact on environmental justice issues.

4.17.3.1 Mitigation

Additional mitigation measures are not required for the Waste Rock Disposal Site Design Alternative because impacts on environmental justice issues would not be anticipated to occur.

4.17.3.2 Unavoidable Adverse Impacts on Environmental Justice

There would be no unavoidable disproportionate impacts on minority or low-income populations as a result of the Waste Rock Disposal Site Design Alternative.

4.17.3.3 Irreversible and Irretrievable Commitments of Resources

There would be no irreversible and irretrievable commitments of resources as a result of the Waste Rock Disposal Site Design Alternative.

4.17.3.4 Relationship of Short-Term Uses and Long-Term Productivity

Short-term uses would not impact long-term economic or social stability of minority or low-income populations in the area of analysis.

4.17.4 Southwest Power Line Alternative

The impacts of the Southwest Power Line Alternative would be the same to those described for the Proposed Action. For this reason, the Southwest Power Line Alternative would not be expected to have any impact on environmental justice issues.

4.17.4.1 Mitigation

Additional mitigation measures are not required for the Southwest Power Line Alternative because impacts on environmental justice issues would not be anticipated to occur.

4.17.4.2 Unavoidable Adverse Impacts on Environmental Justice

There would be no unavoidable disproportionate impacts on minority or low-income populations as a result of the Southwest Power Line Alternative.

4.17.4.3 Irreversible and Irretrievable Commitments of Resources

There would be no irreversible and irretrievable commitments of resources.

4.17.4.4 Relationship of Short-Term Uses and Long-Term Productivity

Short-term uses would not impact long-term economic or social stability of minority or low-income populations in the area of analysis.

4.17.5 No Action Alternative

Because there is no disproportionate effect on an identified minority or low-income populations, or on children from current operations, no further environmental justice analyses are required for the No Action Alternative.

4.18 Hazardous and Solid Waste

4.18.1 Indicators

The following indicators were considered when analyzing potential impacts to resources from hazardous materials and solid waste:

- Tons or pounds per year of hazardous wastes, and by-products;
- Amount and type of hazardous materials transported and stored at the project site;
- Location and type of solid or hazardous waste disposal sites/systems; and
- Existing risk assessments of effects of hazardous compounds.

4.18.2 Proposed Action

The Proposed Action would result in the use of hazardous materials and waste management practices for mine production, with the potential to affect the air, water, soil, and biological resources from an accidental release of hazardous materials and/or solid and hazardous waste during transportation to and from the project area, or during storage and use on the project site.

Access to the project area would be via the proposed access road approximately five miles long, authorized under a BLM ROW that intersects U.S. Highway 50 approximately 17 miles southeast of Eureka, Nevada (Figure 2.3-1). Bulk process chemicals, fuels, and supplies would be transported to the project area by truck along the highways in the region, using the routes identified in Section 3.18 (Figure 3.18-1). Primary fuels and reagents that would be transported to and utilized on the mine are listed in Table 2.3-5. Trucks would also transport small quantities of hazardous waste on an infrequent basis.

It is anticipated that the Proposed Action would result in the classification of a Large Quantity Generator of hazardous waste as defined by the EPA (more than 220 pounds or 100 kilograms per month). Used lubricants and solvents would be characterized according to Resource Conservation and Recovery Act (RCRA) requirements and would be stored appropriately. Midway would institute a waste management plan that would identify the wastes generated at the project area and their appropriate means of disposal. The project area would temporarily store the hazardous wastes on a covered and sealed concrete pad with secondary containment until removal and transport to an authorized recycler or disposal facility. Employees who deal with these wastes would be trained in their proper handling, storage, and emergency procedures relevant to their responsibilities; the firm selected to transport and dispose of these materials would be certified by NDOT and NDEP, as required.

Non-hazardous, solid waste would be managed on-site in a Class III landfill that complies with NAC 444.731 through 444.747. This facility would be constructed as a trench within an active lift of the North WRDA and in the Syncline Pit, and managed in accordance with all applicable state regulatory requirements. The landfill would be covered weekly and its location surveyed and documented. Alternatively, the Syncline Pit would be filled with waste rock. Solid waste would be covered with the waste rock as it is being filled.

The project area has an existing Spill Contingency/Emergency Response Plan (Midway, 2012) that addresses the response to hazardous material spills (including hazardous waste), notification procedures, and spill cleanup procedures for on- and off-site incidents. The purpose of this plan is to establish responsibilities and guidelines for the actions to be taken by mine personnel in the event of a spill at the mine. The guidelines are to help assist personnel and responsible parties to make a timely decision and take positive action to resolve issues.

Construction

Solid waste streams generated during construction of the Proposed Action would include industrial solid waste, sewage, construction debris, nonhazardous regulated wastes, and small quantities of hazardous wastes. Sewage would be collected in portable sanitary facilities and removed by a contractor for off-site treatment and disposal at a permitted treatment facility.

Non-hazardous construction debris would be generated during construction consisting of concrete, wood, scrap metal, and waste packaging materials. Industrial solid waste would be recycled or disposed of on-site in the Class III landfill.

Hydrocarbon or hazardous wastes may be generated from maintenance of heavy equipment in the field. These wastes would include used oil and grease, antifreeze, solvents, and rags. These wastes would be properly contained, labeled, and recycled or disposed of off-site in existing permitted facilities.

Wastes produced during construction would be managed in compliance with state and federal regulations and recycled or disposed of in existing, permitted facilities. These management practices would therefore produce negligible environmental impacts.

Operations, Maintenance, and Reclamation

Operation and maintenance of the Proposed Action would utilize large quantities of hazardous materials and would generate minor amounts of industrial waste, which would be taken to the on-site Class III landfill. The landfill would be permitted and opened to accommodate non-hazardous waste generated by the Proposed Action. Antifreeze, lead-bearing wastes, waste oil, and used solvent would be recycled at approved off-site facilities. These management practices would therefore produce negligible environmental impacts.

Process chemicals and fuel would be transported by truck along the highways in the region, and the proposed access road as identified in Section 3.18 (Figure 3.18-1). Trucks would transport small quantities of hazardous waste on an infrequent basis. Transporters would comply with all applicable state and federal regulations governing the transportation of hazardous materials and waste. Reagent storage would be located at the process plant west of the heap leach pad, between the process ponds. Management of all operations utilizing cyanide would be in accordance with the BLM Nevada Cyanide Management Plan (BLM, 1991).

Explosive agents would be transported, stored, and used in accordance with the Bureau of Alcohol, Tobacco, and Firearms, Department of Homeland Security provisions, Mine Safety and Health Administrations (MSHA) regulations, and other applicable federal, state, or local legal requirements. All explosives, blasting agents, boosters, and blasting caps would be stored within a secured area northeast of the South Pan Pit.

Fuel storage would be in aboveground double-lined tanks with secondary containment structures capable of containing 110 percent of the volume of the largest tank or combined tanks in series. Engineering controls would help to reduce exposure to potential hazards through containment of fuel and chemicals during storage and use, in addition to actions included in the Spill Contingency Plan/Emergency Response Plan (Midway, 2012) to reduce the risk of an on-site chemical or fuel release. Midway would have a trained response team at the project area 24 hours a day, seven days a week to manage potential spills of regulated materials at the project area, thereby reducing potential environmental impacts. Therefore, the risk of chemical or fuel release to the environment would be more likely during transportation operations to and from the project area. The fuel storage area would be located on the south end of the truck shop area with a small amount of storage north of the truck shop.

Petroleum-contaminated soils generated from hydrocarbon spills or leaks in the project area would be placed in a dedicated dumpster located on a concrete pad at a soils storage area and handled in accordance with NDEP guidelines and the Petroleum-Contaminated Soils Management Plan that would be submitted as a requirement of the Water Pollution Control Permit. The petroleum-contaminated soils storage area would be located near the truck shop on the north end of the project area.

Small quantities of hazardous waste would be stored according to state, federal, and local regulations on a covered and sealed concrete pad with secondary containment berms near the truck shop until removal and disposal at an authorized facility. Used antifreeze and oil would also be stored at the truck shop in secondary containment. These materials would be recycled or disposed according to state, federal, and local regulations, as well as the used containers.

Probability of a Release

Process chemicals, fuel, and waste materials could be accidentally released during transport to and from the project area. The Proposed Action would require transport to the project area of the chemicals and quantities described in Table 2.3-5.

The probability of a truck accident involving hazardous materials was analyzed using national accident statistics for truck shipments of hazardous materials (FMCSA, 2001). The primary emphasis in this analysis has been placed upon the release of liquid material that could pose an immediate human health hazard or an off-site contaminant hazard. The estimated deliveries of off-road diesel fuel, sodium cyanide, sodium hydroxide, and hydrochloric acid have therefore been included in this analysis, as the other chemicals that would be used in large quantities are solids, not liquids.

The probability of a truck accident that would result in the release of the selected hazardous materials was calculated using the national rate of releases per mile traveled. Two main travel route distances were assumed for this analysis: 130 miles for the Elko/Eureka route, and 60 miles for the Ely route. The assumed life-of-mine truck deliveries are as follows: off-road diesel fuel – 3588; and hydrochloric acid – 312. The release probability was calculated over a mine life of 13 years. Table 4.18-1 shows the release probability information calculated for both travel routes. A majority of the chemicals would potentially be transported from Elko, based on the railroad hubs located in Elko, as well as the numerous active mines in the Elko area.

The analysis shows that the probability of a release for each chemical would be as follows: diesel fuel – probability of 231.4 in 1,000 for the Elko/Eureka route and 106.8 in 1,000 for the Ely route; sodium cyanide - probability of 23.3 in 1,000 for the Elko/Eureka route and 10.8 in 1,000 for the Ely route; sodium hydroxide - probability of 2.1 in 1,000 for the Elko/Eureka route and 1 in 1,000 for the Ely route; and hydrochloric acid – probability of 5.4 in 1,000 for the Elko/Eureka route and 2.5 in 1,000 for the Ely route. These results indicate a fairly high probability of an accidental release of diesel fuel, but a low probability of an accidental release of sodium cyanide, sodium hydroxide, and hydrochloric acid to the environment during the estimated life of the Proposed Action. National accident statistics for flammable and combustible

materials (diesel fuel) indicate a higher incident of release per mile of travel than the other categories used in this analysis. The probability of a release to the environment in a populated area is estimated to be approximately 30 times less for the Elko/Eureka route than the estimates shown in Table 4.18-2 due to the fact that approximately four miles of this route is located within developed area. There are minor developed areas on the Ely route. Based upon the small quantities of hazardous waste that would be generated by the Proposed Action, an accident resulting in a release to the environment during transportation off the project area is not anticipated.

Table 4.18-1 Hazardous Material National Accident Rate per Mile

Hazardous Material Category	Hazmat Miles	Total Hazmat Accidents	Hazmat Accident Rate Accident/Mile
3 – Flammable & Combustible	2,778,000,000	1,379.02	4.96E-07
6.1- Toxic	218,000,000	50.00	2.30E-07
8 – Corrosive	1,945,000,000	257.00	1.32E-07

Source: Federal Motor Carrier Safety Administration, Comparative Risks of Hazardous Materials and Non-Hazardous Materials Truck Shipment Accidents/Incidents, March 2001

Table 4.18-2 Hazardous Material Probability of Transportation Release

Hazardous Material	Number of LOM Truck Deliveries	Loaded Truck Haul Distance per Trip	Accidents Per Mile[1]	Release Probability
Diesel Fuel (3)	3,588	Elko/Eureka-130	4.96E-07	0.2314
		Ely-60		0.1068
Sodium Cyanide (6.1)	780	Elko/Eureka-130	2.30E-07	0.0233
		Ely-60		0.0108
Sodium Hydroxide (8)	125	Elko/Eureka-130	1.32E-07	0.0021
		Ely-60		0.0010
Hydrochloric Acid (8)	312	Elko/Eureka-130	1.32E-07	0.0054
		Ely-60		0.0025

[1]The rate is based upon the Haz Mat Category of the Chemical shown in Table 4.18-1.

Perennial water sources along the proposed transportation routes are displayed on Figure 3.18-1. These water sources are either parallel or directly cross the potential transportation routes. A release into these areas is possible due to the percentage of the routes paralleling or crossing waterways; however, this is unlikely.

Effects of a Release

The environmental effects of a release would depend on the substance, quantity, timing, and location of the release. The potential for off-site releases during transportation is calculated for hazardous substances only and does not indicate a volume or location. The event could range from a minor oil spill on the project site where cleanup equipment would be readily available to a large fuel or chemical spill during transportation. Some of the chemicals could have immediate adverse effects on water quality and aquatic resources if a spill were to enter a flowing stream or wetland area. Considering the transport routes, the probability of a spill of these materials impacting a wetland or other waterway is possible, though not very likely.

Hydrochloric acid spills which occur on the ground or in water would have the potential to impact local populations of aquatic and terrestrial life through the oxidizing action which destroys plant and animal cells. An acid spill into a waterway would have the potential to migrate from the initial spill site. Rapid response to any spills and subsequent cleanup actions would result in no long-term damage to the environment.

A release of diesel fuel to the ground would have the potential to impact vegetation and could ignite, causing a range fire. A spill into a waterway would cause contamination of water and soil, likely affecting local aquatic populations. With rapid response and cleanup actions, diesel contamination would not result in a long-term increase in hydrocarbons in soils, surface water, or groundwater.

Public Safety

Any large-scale release of these chemicals could have implications for public health and safety. The location of the release would again be a primary factor in determining its importance. However, the probability of a release is low and the probability of a release in a populated area or waterway is low. Therefore, it is not anticipated that a release involving a severe effect to human health or safety would occur during the life of the project.

In the event of a release during transport, the commercial transportation company would be responsible for first response and cleanup. Local and regional law enforcement and fire protection agencies also may be involved to secure the site and protect public safety. In the event of an accident involving hazardous substances, the carrier must notify local emergency response personnel as described in Section 3.18. The release of a reportable quantity of a hazardous substance must be reported to the appropriate state and federal agencies within the specified time frames. The Pan Project Spill Contingency/Emergency Response Plan (Midway, 2012) includes a plan for the response of mine resources to off-site transportation hazardous material releases if requested by an agency; however, Midway anticipates that local and regional agencies would maintain sole responsibility for response to incidents outside of the project area.

4.18.2.1 Mitigation

Additional mitigation measures are not required.

4.18.2.2 Unavoidable Adverse Impacts due to Hazardous Materials

Wastes produced by the Proposed Action would be managed according to all applicable regulations in permitted waste management facilities to minimize environmental impacts. These wastes would contribute to the environmental impacts allowed by the waste management facility permits.

4.18.2.3 Irreversible and Irretrievable Commitments of Resources

Wastes produced during construction and operation of the facilities would be disposed of off-site in existing permitted facilities and would permanently consume some of the waste storage capacity at those facilities.

4.18.2.4 Relationship of Short-Term Uses and Long-Term Productivity

The use of hazardous materials and generation of solid and hazardous wastes in the construction of the Proposed Action (short-term) would consume some capacity, but not significantly impact the productivity of off-site waste management facilities in the long-term.

4.18.3 Waste Rock Disposal Design Alternative

The types of wastes managed and the applicable management practices applied for the Waste Rock Disposal Design Alternative would be the same as for the Proposed Action. The environmental impacts of these practices for the Waste Rock Disposal Design Alternative would therefore be the same as the Proposed Action.

4.18.3.1 Mitigation

Mitigation measures due to hazardous materials would be the same as described for the Proposed Action.

4.18.3.2 Unavoidable Adverse Impacts due to Hazardous Materials

Unavoidable adverse impacts due to hazardous materials would be the same as described for the Proposed Action.

4.18.3.3 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources would be the same as described for the Proposed Action.

4.18.3.4 Relationship of Short-Term Uses and Long-Term Productivity

Relationship of short-term uses and long-term productivity would be the same as described for the Proposed Action.

4.18.4 Southwest Power Line Alternative

The types of wastes managed and the applicable management practices applied for the Southwest Power Line Alternative would be the same as for the Proposed Action. The environmental impacts of these practices for the Southwest Power Line Alternative would therefore be the same as the Proposed Action.

4.18.5 No Action Alternative

The No Action Alternative would result in the Proposed Action not being constructed or operated, and therefore, no hazardous materials would be used in the project area and solid or hazardous wastes would not be generated.

This alternative would include approximately 100 acres of existing and authorized surface disturbance of the 2011 exploration project area, which consists of drill road construction, drill pad construction, trench excavation for bulk metallurgical samples and soil samples, construction and monitoring of groundwater wells, development of a staging area for temporary

storage of drilling materials and equipment, and provision for temporary portable sanitation facilities. Pre-2004 disturbance includes 60.2 acres.