

disturbance. EML would monitor these sites on an annual basis for at least three years after treatment to ensure effectiveness.

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.2.3.3-2a is designed to address the specific spring or surface water that is affected, which enhances the effectiveness of the mitigation. In addition, a variety of approaches to mitigation can be used within these measures to achieve the objective. These mitigation measures are expected to be effective because the mitigation measures are specifically intended to directly address the impact by restoring or enhancing surface flows, and because the measures would be reviewed and addressed by the BLM. Mitigation Measure 3.11.3.5-3 would reduce impacts to the loss of riparian vegetation during Project activities. Replacement with local cuttings, plugs, or seeds would ensure no long-term impacts to the loss of riparian vegetation.

3.11.3.7.1 Residual Adverse Impacts

Following completion and reclamation, residual adverse impacts to wetland and riparian zones from the Slower, Longer Project Alternative would consist of a gradual return of flows to those springs, seeps, and perennial streams that experienced reduced flows from the ground water pumping. In addition, up to 0.22 acre of riparian vegetation within the Project Area would be removed through Project activities.

3.12 Livestock Grazing and Production

3.12.1 Regulatory Framework

BLM Standards and Guidelines for Livestock Grazing

The BLM has established Standards and Guidelines approved by the Secretary of the Interior (43 CFR 4180). The purpose of these Standards and Guidelines is to ensure that BLM administration of grazing helps preserve currently healthy conditions and restores healthy conditions of rangelands (BLM 2001).

BLM Resource Management Plan

The RMP that covers the Project Area includes rangeland programs that authorize livestock grazing on public lands (43 CFR 1601.0-5(b) and CFR 4100.08). The regulations require that the BLM manage livestock grazing on public lands under the principles of multiple use and sustained yield. To accomplish this, rangeland has been broken down into controllable land areas called allotments to manage both short- and long-term objectives for livestock grazing. Allotments are leased to permittees for a defined period of time. **BLM MLFO allotments are managed to achieve Northeast Great Basin Resource Advisory Council standards and guidelines.** They are evaluated periodically by the BLM to determine whether management goals are being met (BLM 2001).

3.12.2 Affected Environment

3.12.2.1 Study Methods

This section includes a discussion of existing grazing allotments, types and classes of livestock, and active grazing preferences, as well as the current grazing practices and management strategies within the Project Area.

3.12.2.2 Existing Conditions

The Project Area is located within six BLM grazing allotments: Lucky C; Roberts Mountain; Romano; Ruby Hill; Shannon Station; and 3 Bars (Figure 3.12.1). Although not located within the Project Area footprint, the Santa Fe/Ferguson Allotment is located within the maximum extent ten-foot ground water drawdown contour and is included in Table 3.12-1 below. **Associated with each of these seven allotments are private lands that are used for livestock grazing and production.** Season of use and type of livestock permitted on the seven allotments are detailed in Table 3.12-1.

Table 3.12-1: Livestock Grazing Permits for the Grazing Allotments Located within the Project Area and Ten-foot Ground Water Drawdown Contour

Grazing Allotment	Type of Livestock	Season of Use	Active Preference (AUMs)
Lucky C	Cattle	4/15 through 2/28	3,054
Subtotal			3,054
Roberts Mountain	Cattle	3/01 through 2/28	7,314
	Sheep	4/10 through 10/15	2,310
Subtotal			9,624
Romano	Cattle	5/01 through 12/31	2,887
Subtotal			2,887
Ruby Hill	Cattle	3/16 through 8/29	275
	Sheep	5/1 through 9/30	1,011
Subtotal			1,286
Shannon Station	Cattle	4/1 through 2/28	2,520
Subtotal			2,520
3 Bars	Cattle	3/1 through 2/28	4,111
	Sheep	3/1 through 2/28	1,729
Subtotal			5,840
Santa Fe/Ferguson	Cattle	3/1 through 12/1	2,767
	Sheep	3/1 through 12/1	1,227
Subtotal			3,994
TOTAL			29,205

The Lucky C Allotment includes approximately 108,666 acres of public land. The active grazing preference for the allotment is 3,054 animal unit months (AUMs) for cattle, or approximately

36 acres per AUM and is under a rotational grazing system. An AUM is the amount of forage **necessary for the sustenance of one cow or its equivalent for a period of one month**. A total of **909.5** acres of the Lucky C Allotment are located in the powerline portion of the Project Area. **In addition, the ten-foot drawdown contour overlaps with the phreatophytes located within this allotment (Figure 3.12.1). According to Figure 3.12.1, this area would cover 3,143 acres (2.89 percent of this allotment).**

The Roberts Mountain Allotment includes approximately 151,060 acres of public land. The active grazing preference for the allotment is 9,624 AUMs for cattle and sheep, or on average approximately 16 acres per AUM. The allotment is currently under a rotation grazing system. A total of 7,954 acres of the Roberts Mountain Allotment are located in the fenced portion of the Project Area (of this, 1,365 acres are located in the Henderson pasture and 6,589 acres in the Nichols pasture).

The Romano Allotment consists of 76,070 acres of public lands with an active grazing preference of 2,887 AUMs for cattle, or approximately 26 acres per AUM (although AUMs/acre vary depending on pastures). This allotment is currently under a rotation grazing system. A total of 6,252 acres of the Romano Allotment are located in the fenced portion of the Project Area.

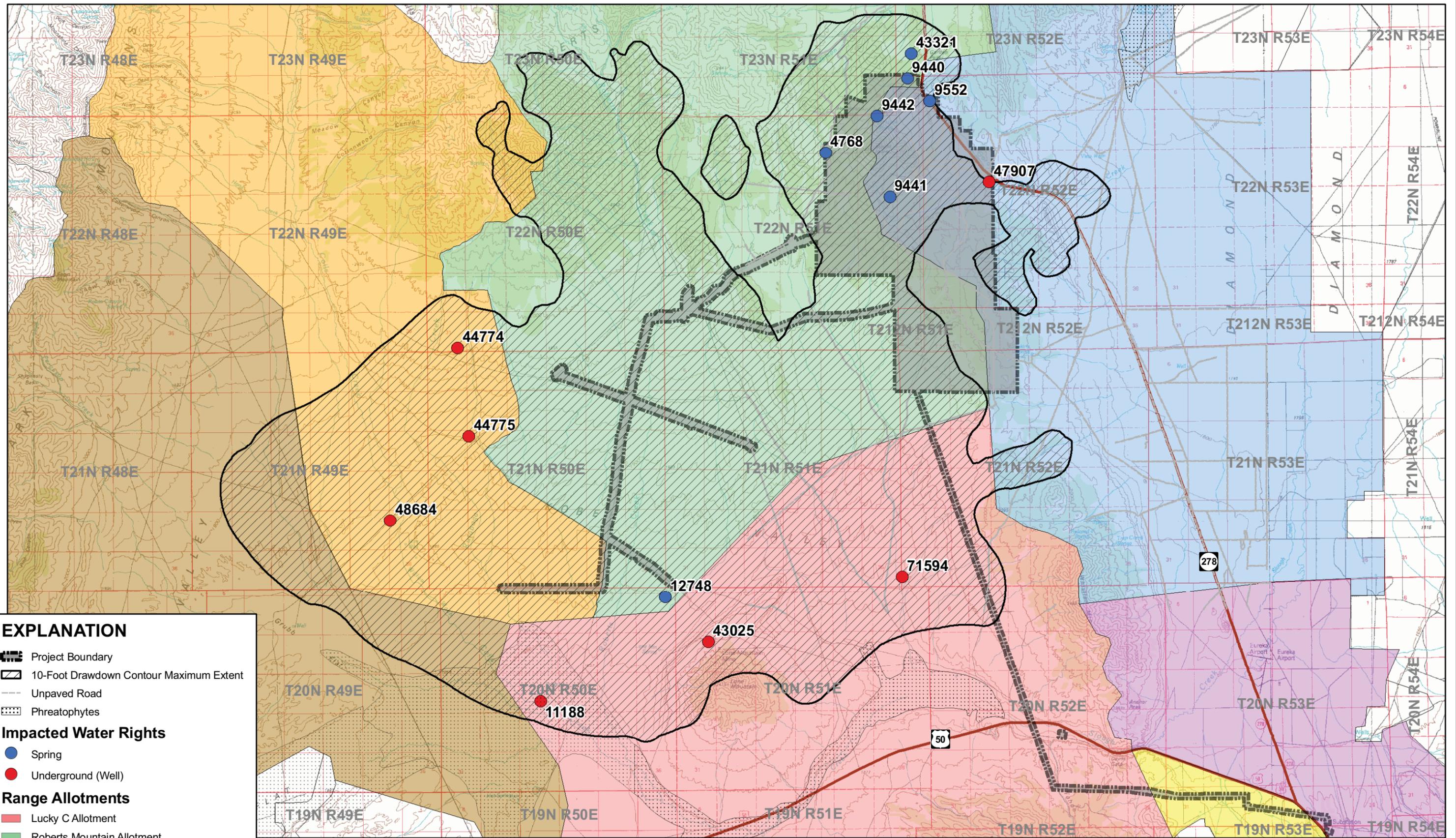
The Ruby Hill Allotment includes approximately 14,659 acres of public land. The active grazing preference for the allotment is 1,286 AUMs for cattle and sheep, or approximately 11 acres per AUM. A total of **317.7** acres of the Ruby Hill Allotment are located in the powerline portion of the Project Area.

The Shannon Station Allotment includes approximately 32,888 acres of public land. The active grazing preference for the allotment is 2,520 AUMs for cattle, or approximately 13 acres per AUM. The allotment is currently under a rotation grazing system. A total of **65.1** acres of the Shannon Station Allotment is located in the powerline portion of the Project Area.

The 3 Bars Allotment includes approximately 76,740 acres of public land. The active grazing preference for the allotment is 5,840 AUMs for cattle and sheep, or approximately 13 acres per AUM. The allotment is currently under a rotation grazing system. A total of 1,157 acres of the 3 Bars Allotment is located in the well field portion of the Project Area. **In addition, the ten-foot drawdown contour overlaps with the phreatophytes located within this allotment (Figure 3.12.1). According to Figure 3.12.1, this area would cover five acres (0.007 percent of this allotment).**

In addition to the six allotments discussed above, the ten-foot drawdown contour **overlaps with the phreatophytes located in** a seventh allotment, the Santa Fe/Ferguson Allotment (Figure 3.12.1). **According to Figure 3.12.1, this area would cover 974 acres (1.2 percent of the allotment).** The Santa Fe/Ferguson Allotment includes approximately 84,375 acres of public land. The active grazing preference for the allotment is 3,994 AUMs for cattle and sheep, or approximately 21 acres per AUM. The allotment is currently under a rotation grazing system.

The following BLM range improvements have been authorized within Sections affected by the entire Project Area: one well; one fence; one fence/cattleguard; one pipeline/trough; one pipeline; two seeding projects; one seeding tank; two spring developments; and one reservoir dam.



EXPLANATION

- Project Boundary
- 10-Foot Drawdown Contour Maximum Extent
- Unpaved Road
- Phreatophytes

Impacted Water Rights

- Spring
- Underground (Well)

Range Allotments

- Lucky C Allotment
- Roberts Mountain Allotment
- Romano Allotment
- Ruby Hill Allotment
- Santa Fe/Ferguson Allotment
- Shannon Station Allotment
- 3 Bars Allotment



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



IF THE ABOVE BAR DOES NOT SCALE 1 INCH, THE DRAWING SCALE IS ALTERED

BATTLE MOUNTAIN DISTRICT OFFICE
 Mount Lewis Field Office
 50 Bastian Road
 Battle Mountain, Nevada 89820

DESIGN: EMLLC	DRAWN: CVD/GSL	REVIEWED: RFD
CHECKED: -	APPROVED: RFD	DATE: 07/31/2012
FILE NAME: p1635_Fig3-12-1_RangeAllotments.mxd		

BUREAU OF LAND MANAGEMENT
MOUNT HOPE PROJECT

DRAWING TITLE:

Range Allotments
Figure 3.12.1

The consequences of weather and climate change on livestock grazing, and grassland use can be subtle and complex. The projected changes in climate – increases in temperature, reductions in soil moisture, and more intense rainfall events – may require changes in livestock management. The availability of feed and water for livestock grazing is extremely vulnerable to drought; hence the carrying capacity of land may influence livestock management.

3.12.3 Environmental Consequences and Mitigation Measures

3.12.3.1 Significance Criteria

Impacts to livestock grazing and production would be considered significant if the Proposed Action or alternatives would result in any of the following:

- Change in forage availability that measurably affects livestock grazing;
- Change in access to water that measurably affects livestock grazing;
- Change in number of AUMs available before, during, and after mining; or
- Undue harassment that adversely affects livestock grazing.

3.12.3.2 Assessment Methodology

Environmental consequences to livestock grazing and production within the Project Area were evaluated using authorized AUMs, pasture/use area acres, and Project disturbance acres. The pasture/use area acres were divided by the total AUMs by pasture (acres/AUM). The Project disturbance within each pasture was then divided by the acres/AUM to determine the total AUMs impacted. Where an allotment did not have pastures or use areas, the total acres and authorized AUMs were utilized for the calculation. **The analysis of effects to livestock grazing and production from the ground water drawdown, utilizes the acreage of phreatophytes within allotments affected by the ten-foot drawdown contour.**

3.12.3.3 Proposed Action

Project-related activities could result in direct impacts to livestock from traffic accidents or other mine-related activities. In order to minimize these impacts, a perimeter fence would be constructed during Project activities that would enclose 14,204 acres in the Mine and Process Area, which includes the open pit, WRDFs, and TSFs. The constructed fence would exclude livestock grazing during mine operations and reclamation for approximately 70 years. The open pit would result in the permanent loss of approximately 734 acres (644 acres within the Romano Allotment and 90 acres within the Roberts Mountain Allotment). **A total of 32 AUMs in the Romano and Roberts Mountain Allotments would be lost in perpetuity as a result of the open pit.** As described in the Proposed Action, the fence would be monitored on a regular basis and repairs made as needed.

When an area of **BLM administered land is devoted to a single public purpose**, such as mineral production, AUMs are adjusted to reflect the area withdrawn from multiple use. These AUMs are lost until such time mining has ceased and reclamation has been successfully completed. At that time, the area will be evaluated to determine if the AUMs can be returned.

In addition to the AUMs permanently lost as a result of the open pit, a total of 490 AUMs in the Roberts Mountain Allotment would be lost for approximately 70 years as a result of

7,954 acres being excluded by the Project fence. This would reduce the active grazing preference to 9,134 AUMs in the allotment from 9,624 AUMs (Table 3.12-2). The loss of AUMs represents five percent of the active grazing preference in the Roberts Mountain Allotment.

In addition to the AUMs permanently lost as a result of the open pit, a total of 291 AUMs in the Romano Allotment would be lost for approximately 70 years as a result of 6,252 acres being excluded by the Project fence. This would reduce the active grazing preference to 2,596 AUMs in the allotment from 2,887 AUMs (Table 3.12-2). The loss of AUMs represents ten percent of the active grazing preference in the Romano Allotment.

Table 3.12-2: Grazing Capacity within the Project Area and Area Affected by Ten-Foot Water Drawdown Contour Before and During Project Activities

Allotment	Active Grazing Capacity (AUMs)	
	Before the Proposed Action	During the Proposed Action
Lucky C	3,054	3,054
Roberts Mountain	9,624	9,134
Romano	2,887	2,596
Ruby Hill	1,286	1,286
Shannon Station	2,520	2,520
3 Bars	5,840	5,840
Santa Fe/Ferguson	3,994	3,994
Total	29,205	28,424

The grazing and agricultural service sectors of the Eureka County economy would be marginally affected by the reduction in AUMs associated with the Proposed Action due to the construction of the fence around 14,204 acres of the Project Area. The fence would exclude access to portions of the Roberts Mountains and Romano Allotments and result in a reduction of 781 AUMs for approximately 70 years **and 32 AUMs permanently from the development of the open pit.** According to the Nevada Grazing Statistics Report and Economic Analysis for Federal Lands in Nevada (Resource Concepts, Inc. 2001), the **total economic impact associated with each AUM equals \$53.40 (1999 dollars) (\$73.75 in 2012 dollars) annually. This value specifically estimates the direct, indirect, and induced impacts of industry output and added value of grazing in Nevada. Applying this value to the AUMs permanently and temporarily displaced under the Proposed Action, the total economic impact could be an annual reduction of \$41,705 (1999 dollars) (\$57,597 in 2012 dollars). This would be a \$15,539 (1999 dollars) (\$21,460 2012 dollars) impact resulting from displaced Romano Allotment AUMs and a \$26,166 (1999 dollars) (\$36,137 2012 dollars) impact resulting from displaced Roberts Mountain Allotment AUMs. While the impact may not be significant to the ranching community, the impact may be meaningful to individual ranch operations. However, it is important to note that this impact reflects the total economic impact, not lost revenue for specific operators. The subsequent two paragraphs describe in greater detail the economic impact to grazing investigated in the Nevada Grazing Statistics Report and Economic Analysis for Federal Lands in Nevada Report.**

The direct industry impacts to Nevada’s economy from one AUM are estimated to be \$24.40 based on the total production value of grazing divided by the total AUMs. Indirect and induced impacts to the industry, estimated at \$16.00 per AUM, occur throughout the economy as a result

of providing goods and services to the livestock industry and include other industrial sectors such as crops, construction, manufacturing, transportation, communication, utilities, and trade and services. Induced impacts include those caused by household consumption as a result of the direct and indirect impacts. In total, industry impacts were estimated to equal \$40.40 per AUM (1999 dollars).

The labor income impact estimates (total \$7.40 per AUM) are based on the wages and salaries of workers and proprietors' income. Total value-added impacts (\$13.00 per AUM) include impacts to wages and salaries, proprietors' income, other property income (i.e., interest, rent, royalties), and indirect business taxes (1999 dollars). Employment impacts based on \$24.40 direct industry impacts are too small to have any impact based on one AUM.

Based on the estimated direct, indirect, and induced economic impacts of one AUM (\$53.40), the economic value of the 781 AUMs reduced during the life of the Project equates to \$41,705.40 per year, or in sum \$2,919,378.00 over approximately 70 years. This represents approximately 2.7 percent of the economic value of all the allotments affected by the Project. The permanent loss of 32 AUMs (valued at \$1,708.80 annually **in 1999 dollars**) represents less than one percent of all allotments affected by the Project and, therefore, is considered a minor impact on the long-term Eureka County grazing economy.

Table 3.12-2 includes the active preference before and during the Project for the affected allotments. The loss of 781 AUMs represents 2.7 percent of the active grazing preference for the allotments in the Project Area.

- **Impact 3.12.3.3-1: Project development and operation under the Proposed Action would result in the permanent loss of 32 AUMs and the loss of 781 AUMs for approximately 70 years from allotments within the fenced Project Area.**

Significance of the Impact: The impact is considered potentially significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures. Also see Section 3.26 for suggested mitigation outside of the BLM's jurisdiction.

The 14,204-acre enclosure would not impact AUMs within the 3 Bars, Santa Fe/Ferguson, or Lucky C Allotments; however, portions of these allotments could **sustain** potential impacts to AUMs due to the possible impacts to forage in the phreatophyte vegetation community related to ground water drawdown. **Figure 3.12.1 illustrates the location of phreatophytes relative to the allotments within the Project Area boundary and the ten-foot drawdown contour. There are no phreatophytes on private land within the ten-foot drawdown.**

Ground water drawdown could result in a change from phreatophytes to another vegetation community composed of plant species that do not have long roots that reach down to the water table that would still provide forage for livestock. **Impacts are not expected to other vegetation communities that do not rely on the direct connection to ground water.** Additionally, reseeding mitigation proposed in Section 3.11.3 would ensure the availability of forage for livestock in areas identified by the BLM. **Following reseeding, the BLM would evaluate and determine if there is a need to suspend livestock grazing for two years or until the objectives of the seeding are met. The BLM would utilize rangeland standards as a goal**

following reseeding and revegetation. Impacts to other vegetation communities as a result of drawdown are not expected. Therefore, impacts to overall AUM availability within the allotments as a result of the drawdown are not expected.

- **Impact 3.12.3.3-2: Phreatophyte vegetation would potentially experience a change in species composition and percent cover due to the predicted water table drawdown associated with ground water pumping and subsequent recovery of the water table. Although the lowering of the water table in the area of phreatophytes is not expected to result in a net loss of vegetation in these communities, it is possible that the changes in phreatophyte community would result in a loss of forage productivity. Impacts to other vegetation communities as a result of drawdown are not expected.**

Significance of the Impact: The impact is considered potentially significant. The following mitigation has been identified for this impact.

- **Mitigation Measure 3.12.3.3-2: The BLM would monitor for changes to forage productivity as a result of ground water drawdown associated with Project-related ground water pumping. If the BLM detects a loss of forage productivity attributed to the Project, the BLM would develop and provide EML with a list of appropriate seed mixes for those areas within and outside the Project Area impacted by water table drawdown that should be seeded. The nature of the seed mix may vary depending on the conditions encountered as a result of the drawdown. If the BLM determines reseeding to be necessary, the BLM would coordinate the conditions for reseeding (including a possible two-year grazing closure) with local permittees in order to reduce impacts to AUMs. Mitigation for the potential loss of water available for livestock from stock water rights and other surface waters are described in the Water Resources - Water Quantity impacts discussion (Mitigation Measures 3.2.3.3-2 and 3.2.3.3-3). Mitigation for loss of water available would also mitigate the loss of vegetation (livestock forage).**
- **Effectiveness of Mitigation and Residual Effects: Mitigation measure 3.12.3.3-2 would reduce potential impacts to local permittees from changes in vegetation species composition and percent cover as a result of water table drawdown during Project activities. Monitoring vegetation and possible reseeding with an appropriate seed mix, as well as BLM coordination with local permittees following reseeding, would reduce the long-term impacts to AUMs, although short-term impacts may occur while any reseeding effort is implemented. If a two-year suspension is required, impacts would persist until the suspension is lifted, in an amount proportionate to the amount of AUMs temporarily suspended.**

Mine dewatering, ground water pumping, **and** subsequent recovery of the water table is expected to draw down the ground water table in an area surrounding the open pit. As discussed in Section 3.2, modeling results show that significant water table drawdown in the aquifer would occur in an area measuring approximately 232 square miles around the Project Area, including the northeast quadrant of Kobeh Valley and the southernmost fringe of Roberts Mountains. Stock water resources within the ten-foot drawdown contour from Proposed Action pumping include water rights within the Romano, Lucky C, Roberts Mountain, 3 Bars, and Santa Fe/Ferguson Allotments. Eighteen existing stock water rights occurring within the ten-foot drawdown area

may experience negative impacts including a reduction in available water or complete water loss as a result of ground water drawdown associated with the Proposed Action (Figure 3.12.1). Table 3.2-7 in the Water Resources - Water Quantity Section identifies the water rights associated with stock water that would be located within the ten-foot drawdown contour from the Proposed Action activities. Twenty-two springs and two segments of perennial streams are also located within the area predicted to be impacted by the ground water drawdown. Livestock that utilize those sources of water could be affected. Springs predicted to be impacted are shown on Figure 3.2.9.

Livestock require water year long to satisfy physiological requirements. The reduction or loss of existing water sources could impact livestock in the Project Area. A reduction in surface water could **also** affect the amount of foraging habitat for livestock, **as discussed previously**.

- **Impact 3.12.3.3-3:** Livestock dependent on existing water sources in the Project Area would potentially experience water stress due to the water table drawdown associated with ground water pumping and subsequent recovery of the water table. Lowering of the water table could result in reduced water available for use in rangeland management.

Significance of the Impact: The impact could be potentially significant. **The following mitigation has been identified for this impact.**

- **Mitigation Measure 3.12.3.3-3:** Mitigation for the potential loss of water availability for livestock from stock water rights and other surface waters are described in the Water Resources - Water Quantity impacts discussion (Mitigation Measures 3.2.3.3-2 and 3.2.3.3-3). **Implementation of any of the specific mitigation outlined in these measures for springs located on private land would be subject to the authorization of the private land owner. Mitigation for loss of water available would also mitigate the loss of vegetation (livestock forage). Additionally, where livestock and wild horse use overlap those mitigation measures identified for wild horses (Mitigation Measure 3.13.3.3-1) would also benefit livestock.**
- **Effectiveness of Mitigation and Residual Effects:** Implementation of Mitigation Measures in Section 3.2.3 would effectively mitigate any reductions in water available for use in rangeland management (i.e., this includes livestock grazing), **with the exception of impacts to forage on private land associated with riparian areas. The BLM cannot require a private land owner to consent to the implementation of mitigation on their private land; therefore, there is a potential loss of forage associated with the riparian areas on private land.** Ongoing monitoring included in the mitigation measures would ensure that adequate water supplies are maintained and available for livestock.

No impacts to existing range improvements other than developed spring sites **and removal of existing fencing within the Project fence** are anticipated.

The evaluation of the potential effects of the pit lake on livestock used a screening level ecological risk assessment (SLERA). The general approach used in the preparation of the SLERA is similar to that developed by the Environmental Sciences Division and Life Sciences Division of Oak Ridge National Laboratory for the U.S. Department of Energy. In addition, the SLERA incorporated more recent toxicity reference values (TRVs) for certain inorganic

chemical constituents derived by the EPA (SRK 2009). Together, these were used to develop species-specific toxicity criteria to which the predicted constituents in the pit water were compared.

Protective criteria for the surrogate species are likely to be protective of local species occupying similar ecological niches at the Project Area. Additionally, it was assumed that the livestock receptors would consume water from the pit lake; and, that this water would constitute 100 percent of each species individual daily water requirements (i.e., no outside sources of water would be utilized over the life of the animal). This is considered an extremely conservative assumption.

The results of the assessment indicate that the most likely predicted water quality of the modeled future pit lake water at the Project Area could represent a low to moderate toxicological threat to livestock based on Nevada's beneficial use standard for livestock watering. However, since this water is not intended to be a livestock watering source **and livestock access would be restricted by the construction of the pit perimeter berm**, and the standards were based on limited toxicological information, the probable risk to livestock from the pit lake created under the Proposed Action would be low.

The majority of disturbed lands within the 14,204-acre enclosure would be reclaimed and available for future grazing. Successful revegetation of disturbed lands would increase plant cover and provide an adequate amount of forage to recover the majority of AUMs lost during the Project. Once vegetation has been successfully re-established (BLM/NDEP standards), the BLM would **re-evaluate livestock grazing** in the Project Area.

3.12.3.3.1 Residual Adverse Impacts

The Proposed Action would result in the unavoidable permanent loss of **32 AUMs from the development of the open pit and the loss of 781 AUMs for approximately 70 years from allotments within the fenced Project Area.**

3.12.3.4 No Action Alternative

Under the No Action Alternative, the proposed Project would not be developed and associated impacts to livestock grazing and production would not occur. EML would continue existing activities under previously permitted Notices, and the area would remain available for future mineral development or for other purposes as approved by the BLM.

3.12.3.4.1 Residual Adverse Impacts

There would be no residual adverse impacts to livestock grazing and production under the No Action Alternative.

3.12.3.5 Partial Backfill Alternative

Impacts to livestock grazing and production would be similar to those described for the Proposed Action; however, the Partial Backfill Alternative would involve the partial backfilling of the open pit to eliminate the pit lake, and the floor of the backfilled open pit (approximately 527 acres) would be reclaimed with growth media and seeded. **Because the pit lake would be**

eliminated, there would be no potential for adverse impacts due to livestock drinking water from the pit lake. Livestock, however, would continue to be excluded from the open pit area, and impacts under this alternative would **otherwise** be similar to those described for the Proposed Action.

- **Impact 3.12.3.5-1:** Project development and operation under the Partial Backfill Alternative would result in the **permanent loss of 32 AUMs and the loss of 781 AUMs for approximately 70 years** from allotments within the fenced Project Area.

Significance of the Impact: The impact is considered potentially significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures. Also see Section 3.26 for suggested mitigation outside of the BLM's jurisdiction.

Impacts to forage productivity as a result of the predicted water table drawdown associated with ground water pumping and subsequent recovery of the water table under the Partial Backfill Alternative would be similar to those impacts described for the Proposed Action.

- **Impact 3.12.3.5-2:** Phreatophyte vegetation would potentially experience a change in species composition and percent cover due to the predicted water table drawdown associated with ground water pumping and subsequent recovery of the water table. Although the lowering of the water table in the area of phreatophytes is not expected to result in a net loss of vegetation in these communities, it is possible that the changes in phreatophyte community would result in a loss of forage productivity. Impacts to other vegetation communities as a result of drawdown are not expected.

Significance of the Impact: The impact is considered potentially significant. The following mitigation has been identified for this impact.

- **Mitigation Measure 3.12.3.5-2:** The BLM would monitor for changes to forage productivity as a result of ground water drawdown associated with Project-related ground water pumping. If the BLM detects a loss of forage productivity attributed to the Project, the BLM would develop and provide EML with a list of appropriate seed mixes for those areas within and outside the Project Area impacted by water table drawdown that should be seeded. The nature of the seed mix may vary depending on the conditions encountered as a result of the drawdown. If the BLM determines reseeding to be necessary, the BLM would coordinate the conditions for reseeding (including a possible two-year grazing closure) with local permittees in order to reduce impacts to AUMs. Mitigation for the potential loss of water available for livestock from stock water rights and other surface waters are described in the Water Resources - Water Quantity impacts discussion (Mitigation Measures 3.2.3.3-2 and 3.2.3.3-3). Mitigation for loss of water available would also mitigate the loss of vegetation (livestock forage).
- **Effectiveness of Mitigation and Residual Effects:** Mitigation measure 3.12.3.5-2 would reduce potential impacts to local permittees from changes in vegetation

species composition and percent cover as a result of water table drawdown during Project activities. Monitoring vegetation and possible reseeding with an appropriate seed mix, as well as BLM coordination with local permittees following reseeding, would reduce the long-term impacts to AUMs, although short-term impacts may occur while any reseeding effort is implemented. If a two year suspension is required, impacts would persist until the suspension is lifted, in an amount proportionate to the amount of AUMs temporarily suspended.

- **Impact 3.12.3.5-3:** Livestock dependent on existing water sources in the Project Area would potentially experience water stress due to the water table drawdown associated with ground water pumping and subsequent recovery of the water table. Lowering of the water table could result in reduced water available for use in rangeland management.

Significance of the Impact: The impact could be potentially significant. The following mitigation has been identified for this impact.

- **Mitigation Measure 3.12.3.5-3:** Mitigation for the potential loss of water availability for livestock is described in the Water Resources - Water Quantity impacts discussion (Mitigation Measures 3.2.3.3-2 and 3.2.3.3-3). **Implementation of any of the specific mitigation outlined in these measures for springs located on private land would be subject to the authorization of the private land owner. Mitigation for loss of water available would also mitigate the loss of vegetation (livestock forage). Additionally, where livestock and wild horse use overlap those mitigation measures identified for wild horses (Mitigation Measure 3.13.3.3-1) would also benefit livestock.**
- **Effectiveness of Mitigation and Residual Effects:** Implementation of Mitigation Measures in Section 3.2.3 would effectively mitigate any reductions in water available for use in rangeland management, **with the exception of impacts to forage on private land associated with riparian areas. The BLM cannot require a private land owner to consent to the implementation of mitigation on their private land; therefore, there is a potential loss of forage associated with the riparian areas on private land.** Ongoing monitoring included in the mitigation measures would ensure that adequate water supplies are maintained and available for livestock.

3.12.3.5.1 Residual Adverse Impacts

Residual impacts for livestock grazing and production under the Partial Backfill Alternative would be the loss of **32 AUMs from the development of the open pit and the loss of 781 AUMs for approximately 70 years from allotments within the fenced Project Area.**

3.12.3.6 Off-Site Transfer of Ore Concentrate for Processing Alternative

Although the Off-Site Transfer of Ore Concentrate for Processing Alternative would result in approximately 20 acres less surface disturbance compared to the Proposed Action, impacts to livestock grazing and production from this alternative would be similar to those for the Proposed Action since the acreage would decrease by only 0.2 percent.

- **Impact 3.12.3.6-1:** Project development and operation under the Off-Site Transfer of Ore Concentrate for Processing Alternative would result in the **permanent loss of 32 AUMs**

and the loss of 781 AUMs for approximately 70 years from allotments within the fenced Project Area.

Significance of the Impact: The impact is considered potentially significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures. Also see Section 3.26 for suggested mitigation outside of the BLM's jurisdiction.

Impacts to forage productivity as a result of the predicted water table drawdown associated with ground water pumping and subsequent recovery of the water table under the Off-Site Transfer of Ore Concentrate for Processing Alternative would be similar to those impacts described for the Proposed Action.

- **Impact 3.12.3.6-2:** Phreatophyte vegetation would potentially experience a change in species composition and percent cover due to the predicted water table drawdown associated with ground water pumping and subsequent recovery of the water table. Although the lowering of the water table in the area of phreatophytes is not expected to result in a net loss of vegetation in these communities, it is possible that the changes in phreatophyte community would result in a loss of forage productivity. Impacts to other vegetation communities as a result of drawdown are not expected.

Significance of the Impact: The impact is considered potentially significant. The following mitigation has been identified for this impact.

- **Mitigation Measure 3.12.3.6-2:** The BLM would monitor for changes to forage productivity as a result of ground water drawdown associated with Project-related ground water pumping. If the BLM detects a loss of forage productivity attributed to the Project, the BLM would develop and provide EML with a list of appropriate seed mixes for those areas within and outside the Project Area impacted by water table drawdown that should be seeded. The nature of the seed mix may vary depending on the conditions encountered as a result of the drawdown. If the BLM determines reseeding to be necessary, the BLM would coordinate the conditions for reseeding (including a possible two-year grazing closure) with local permittees in order to reduce impacts to AUMs. Mitigation for the potential loss of water available for livestock from stock water rights and other surface waters are described in the Water Resources - Water Quantity impacts discussion (Mitigation Measures 3.2.3.3-2 and 3.2.3.3-3). Mitigation for loss of water available would also mitigate the loss of vegetation (livestock forage).
- **Effectiveness of Mitigation and Residual Effects:** Mitigation measure 3.12.3.6-2 would reduce potential impacts to local permittees from changes in vegetation species composition and percent cover as a result of water table drawdown during Project activities. Monitoring vegetation and possible reseeding with an appropriate seed mix, as well as BLM coordination with local permittees following reseeding, would reduce the long-term impacts to AUMs, although short-term impacts may occur while any reseeding effort is implemented. If a two year suspension is

required, impacts would persist until the suspension is lifted, in an amount proportionate to the amount of AUMs temporarily suspended.

- **Impact 3.12.3.6-3:** Livestock dependent on existing water sources in the Project Area would potentially experience water stress due to the water table drawdown associated with ground water pumping and subsequent recovery of the water table. Lowering of the water table could result in reduced water available for use in rangeland management.

Significance of the Impact: The impact could be potentially significant. **The following mitigation has been identified for this impact.**

- **Mitigation Measure 3.12.3.6-3:** Mitigation for the potential loss of water availability for livestock is described in the Water Resources - Water Quantity impacts discussion (Mitigation Measures 3.2.3.3-2 and 3.2.3.3-3). **Implementation of any of the specific mitigation outlined in these measures for springs located on private land would be subject to the authorization of the private land owner. Mitigation for loss of water available would also mitigate the loss of vegetation (livestock forage). Additionally, where livestock and wild horse use overlap those mitigation measures identified for wild horses (Mitigation Measure 3.13.3.3-1) would also benefit livestock.**
- **Effectiveness of Mitigation and Residual Effects:** Implementation of Mitigation Measures in Section 3.2.3 would effectively mitigate any reductions in water available for use in rangeland management, **with the exception of impacts to forage on private land associated with riparian areas. The BLM cannot require a private land owner to consent to the implementation of mitigation on their private land; therefore, there is a potential loss of forage associated with the riparian areas on private land.** Ongoing monitoring included in the mitigation measures would ensure that adequate water supplies are maintained and available for livestock.

3.12.3.6.1 Residual Adverse Impacts

The Off-Site Transfer of Ore Concentrate for Processing Alternative would result in the unavoidable permanent loss of **32 AUMs from the development of the open pit and the loss of 781 AUMs for approximately 70 years from allotments within the fenced Project Area.**

3.12.3.7 Slower, Longer Project Alternative

Impacts under the Slower, Longer Project Alternative would be of the same type as the impacts under the Proposed Action, but would last for approximately 115 years.

The number of AUMs lost would be the same as the Proposed Action. However, the potential for resumption of livestock grazing within the fenced Project Area would be prolonged (115 years compared to 70 years). **Based on the longer Project duration, the economic impact to livestock grazing as a result of this alternative would be approximately \$1,876,743 more than the impact under the Proposed Action.**

The 14,204-acre enclosure would not impact AUMs within the 3 Bars, Santa Fe/Ferguson, or Lucky C Allotments but could potentially impact AUMs due to possible impacts to forage and habitat related to water level drawdown.

- **Impact 3.12.3.7-1:** Project development and operation under the Slower, Longer Project Alternative would result in **permanent loss of 32 AUMs and the loss of 781 AUMs for approximately 115 years** from allotments within the Project Area.

Significance of the Impact: The impact is considered potentially significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures. Also see Section 3.26 for suggested mitigation outside of the BLM's jurisdiction.

Impacts to forage productivity as a result of the predicted water table drawdown associated with ground water pumping and subsequent recovery of the water table under the Slower, Longer Project Alternative would be similar to those impacts described for the Proposed Action, but of a longer duration.

- **Impact 3.12.3.7-2:** Phreatophyte vegetation would potentially experience a change in species composition and percent cover due to the predicted water table drawdown associated with ground water pumping and subsequent recovery of the water table. Although the lowering of the water table in the area of phreatophytes is not expected to result in a net loss of vegetation in these communities, it is possible that the changes in phreatophyte community would result in a loss of forage productivity. Impacts to other vegetation communities as a result of drawdown are not expected.

Significance of the Impact: The impact is considered potentially significant. The following mitigation has been identified for this impact.

- **Mitigation Measure 3.12.3.7-2:** The BLM would monitor for changes to forage productivity as a result of ground water drawdown associated with Project-related ground water pumping. If the BLM detects a loss of forage productivity attributed to the Project, the BLM would develop and provide EML with a list of appropriate seed mixes for those areas within and outside the Project Area impacted by water table drawdown that should be seeded. The nature of the seed mix may vary depending on the conditions encountered as a result of the drawdown. If the BLM determines reseeding to be necessary, the BLM would coordinate the conditions for reseeding (including a possible two-year grazing closure) with local permittees in order to reduce impacts to AUMs. Mitigation for the potential loss of water available for livestock from stock water rights and other surface waters are described in the Water Resources - Water Quantity impacts discussion (Mitigation Measures 3.2.3.3-2 and 3.2.3.3-3). Mitigation for loss of water available would also mitigate the loss of vegetation (livestock forage).
- **Effectiveness of Mitigation and Residual Effects:** Mitigation measure 3.12.3.7-2 would reduce potential impacts to local permittees from changes in vegetation species composition and percent cover as a result of water table drawdown during Project activities. Monitoring vegetation and possible reseeding with an appropriate seed mix, as well as BLM coordination with local permittees following reseeding, would reduce the long-term impacts to AUMs, although short-term impacts may occur while any reseeding effort is implemented. If a two year suspension is

required, impacts would persist until the suspension is lifted, in an amount proportionate to the amount of AUMs temporarily suspended.

The majority of disturbed lands within the 14,204-acre enclosure would be reclaimed and available for future grazing. Successful revegetation of disturbed lands would increase plant cover and provide an adequate amount of forage to recover the majority of AUMs lost during the Project. Once vegetation has been successfully re-established (BLM/NDEP standards), the BLM would evaluate livestock resumption within the Project Area.

The open pit would result in the permanent loss of approximately 734 acres (644 within the Romano Allotment and 90 acres within the Roberts Mountain Allotment).

As discussed in the Proposed Action, 18 existing stock water rights occurring within the ten-foot drawdown area may experience negative impacts including a reduction in available water or complete water loss as a result of ground water drawdown associated with the Slower, Longer Project Alternative. Livestock require water year long to satisfy physiological requirements. The reduction or loss of existing water sources could impact livestock in the Project Area. A reduction in surface water would affect the amount of foraging habitat for livestock.

- **Impact 3.12.3.7-3:** Livestock dependent on existing water sources in the Project Area would potentially experience water stress due to the water table drawdown associated with ground water pumping and subsequent recovery of the water table. Lowering of the water table could result in reduced water available for use in rangeland management.

Significance of the Impact: The impact could be potentially significant. **The following mitigation has been identified for this impact.**

- **Mitigation Measure 3.12.3.7-3:** Mitigation for the potential loss of water availability for livestock from stock water rights and other surface waters is described in the Water Resources - Water Quantity impacts discussion (Mitigation Measures 3.2.3.3-2 and 3.2.3.3-3). **Implementation of any of the specific mitigation outlined in these measures for springs located on private land would be subject to the authorization of the private land owner. Mitigation for loss of water available would also mitigate the loss of vegetation (livestock forage). Additionally, where livestock and wild horse use overlap those mitigation measures identified for wild horses (Mitigation Measure 3.13.3.3-1) would also benefit livestock.**

- **Effectiveness of Mitigation and Residual Effects:** Implementation of Mitigation Measures in Section 3.2.3 would effectively mitigate any reductions in water available for use in rangeland management), **with the exception of impacts to forage on private land associated with riparian areas. The BLM cannot require a private land owner to consent to the implementation of mitigation on their private land; therefore, there is a potential loss of forage associated with the riparian areas on private land.** Ongoing monitoring included in the mitigation measures would ensure that adequate water supplies are maintained and available for livestock.

No impacts to existing range improvements **other than developed spring sites and removal of existing fencing within the Project fence** are anticipated.

The probable risk to livestock from the pit lake created under the Slower, Longer Project Alternative is the same as for the Proposed Action and would be low.

3.12.3.7.1 Residual Adverse Impacts

The Slower, Longer Project Alternative would result in the unavoidable permanent loss of **32 AUMs from the development of the open pit.**

3.13 Wild Horses

3.13.1 Regulatory Framework

Under the FLPMA, wild horses and burros are one of the multiple uses that the BLM must manage in combination to best meet the public's present and future needs. The FLPMA included the approval for the use of helicopters for gathers and required that a current inventory of wild horses and burros be maintained. The Public Rangelands Improvement Act of 1978 defined excess horses, mandated research, and provided guidance for titles of adopted horses and the adoption process.

3.13.1.1 Wild Free-Roaming Horses and Burros Act

The Wild Free-Roaming Horses and Burros Act of 1971 (WFRHBA) (Public Law 92-195) protects wild free-roaming horses and burros from capture, branding, harassment, or death. This Act also defines the ecological and multiple-use role of the management of wild horses and burros on federal lands and their historical and cultural value. The Act applies to all unbranded and unclaimed horses and burros on public lands administered by the BLM (43 CFR 4700) (BLM 2000). In accordance with the WFRHBA, wild horses are to be managed so as to maintain a thriving natural ecological balance on the range, and protect the range from the deterioration associated with overpopulation.

Herd Management Areas (HMAs) are identified in Land Use Planning for long-term management of wild horses and are designated "Special Management Areas" on public lands. The BLM maintains and manages wild horses **and burros** in HMAs and in Nevada wild horses and burros are found in approximately 100 HMAs, totaling approximately 15,249,265 acres (BLM 2011a). Establishment of HMAs must take into consideration the Appropriate Management Level (AML) for the herd, the habitat requirements of the animals, and the relationships with other uses of public land. The objective of the management of wild horses and burros is to limit the animals' distribution to the Herd Areas (HAs), which are limited to areas of public lands identified as being habitat used by wild horses and burros at the time of the passage of the WFRHBA (43 CFR 47000-5(d)). A herd is defined as one or more stallions and his mares. Management strategies include monitoring, inventory, and removal of excess wild horses or burros through periodic gathers, with an emphasis to limit management activities to the minimal feasible level (BLM 2000).

Wild horse and burro herds increase at relatively high rates because they **have virtually no** natural predators (BLM 2000). The majority of wild horse foals are born between March 1 and July 1, annually. Throughout the HMAs, populations increase by ten to 22 percent annually. AMLs have been established by the BLM's MLFO. According to the WFRHBA, when population inventory, monitoring data, and other data indicate that an over population of wild

horses exists, a gather would be planned to remove excess wild horses and achieve the AML. Other population controls such as fertility control may also be implemented to slow population growth rates and maintain a thriving natural ecological balance on the range and protect the range from the deterioration associated with overpopulation. The BLM prepares the horses and burros for adoption through permanent adoption centers. The BLM is also guided by the Nevada Northeastern Great Basin Resource Advisory Council to promote healthy rangelands through implementation of standards and guidelines for maintaining healthy wild horse and burro herds on HMAs.

3.13.2 Affected Environment

3.13.2.1 Study Methods

This section includes a discussion of wild horse movement, gathers, and existing HMAs within the Project Area. The predicted ten-foot ground water drawdown would also impact the Fish Creek HMA and Kobeh Valley HA. The Roberts Mountain, Whistler Mountain, and Fish Creek HMAs and Kobeh Valley HA are managed jointly by the BLM as a Wild Horse Complex.

3.13.2.2 Existing Conditions

The Project is located within the Roberts Mountain and Whistler Mountain HMAs.

Roberts Mountain HMA

The Roberts Mountain HMA is located 30 miles northwest of Eureka, Nevada, in Eureka County west of SR 278. The HMA consists of 99,990 acres and is 17 miles long by ten miles wide. The HMA shares the eastern boundary with the Whistler Mountain HMA.

The AML for the Roberts Mountain HMA is 150 wild horses. **The 2012 post-foaling population is 273.** Many of the horses in the Roberts Mountain HMA are distributed into the lower elevations of Kobeh Valley during both summer and winter. Several water sources appear to be key in influencing movement patterns. Figures 3.2.2 and 3.2.3 identify known surface water sources available to wild horses within and adjacent to the HMA. Wild horses also move back and forth into the Whistler Mountain HMA and outside of HMA boundaries into the Kobeh Valley HA and the northern portion of the Fish Creek HMA.

Wild horses travel throughout the Roberts Mountain HMA with few impediments to the movement. There are several pasture fences and drift fences throughout the two allotments included within the HMA, but the horses know where the fences are located and travel through open gates and around drift fences. During summer months, horses may move into the higher elevations and foothills that support piñon-juniper and contain springs and ponds. A primary water source used by horses in summer is Mud Springs, a water filled depression that holds water until late summer. During winter months, wild horses often move down to the lower elevations in the southern portion of the HMA as snow accumulates in the mountains. During the winter months, wild horses from the Roberts Mountain HMA have been documented moving south out of the HMA into the northwest portion of Kobeh Valley and joining with wild horses from the Whistler Mountain and Fish Creek HMAs.

The wild horses within the Roberts Mountain HMA are known to be moderate to large in size with good to excellent confirmation. Colors include many buckskins, palominos, roans, and duns in addition to the typical colors of bay, brown, and black (Personal Communication, Shawna Richardson, BLM Wild Horse Specialist, March 20, 2007). Genetic variability of this herd is high and this is likely due to both the past large population size and mixing with other herds. Genetic similarity results suggest a herd with mixed ancestry that is primarily North American which is consistent with the appearance of the horses.

A total of approximately **12,114** acres of the Project is located within the Roberts Mountain HMA. **Approximately 19 percent of the Project Area (excluding the portion of the HMA that occurs within the fenced portion of the Project Area) is located within this HMA.**

Whistler Mountain HMA

The Whistler Mountain HMA is located ten miles northwest of Eureka, Nevada, in Eureka County. The eastern boundary of the Whistler Mountain HMA lies along SR 278. The Whistler Mountain HMA consists of 43,247 acres and is 16 miles long and seven miles wide. The Whistler Mountain HMA shares its western boundary with the Roberts Mountain HMA and wild horses frequently move between the two HMAs. Additionally, no fence exists on the western boundary of the Whistler Mountain HMA in Kobeh Valley, allowing wild horse movement into the valley.

The AML for the Whistler Mountain HMA has been set for 14 to 24 wild horses. **The 2012 population** The AML for the Whistler Mountain HMA was developed with consideration of the movement patterns of the wild horses to ensure that their year round needs are met, and that over-utilization of the vegetation does not occur. The AML was also set at a level to ensure that wild horses are successful in drought years when forage and water may be limited.

The wild horses using the Whistler Mountain HMA and the Kobeh Valley area are strongly associated with the Roberts Mountain HMA. Fencelines separate the Roberts Mountain, Romano, and Lucky C Allotments; however, wild horses have found places to cross the fence by taking advantage of open gates and travel back and forth between the areas. Throughout the year, wild horses move back and forth into the Roberts Mountain HMA, as a result of changes in water supply, presence of livestock, and changes in forage condition and climate. In summer months, it is likely that the wild horses from the Whistler Mountain HMA move west into the Roberts Mountain HMA to access water sources and cooler, higher elevations. Figures 3.2.2 and 3.2.3 identify known surface water sources available to wild horses within and adjacent to the HMA.

In recent years, many wild horses have been observed in the Mount Hope vicinity especially in the spring; however, there may be a number of year-round wild horse residents in certain years. As many as 80 wild horses were estimated to be using the Mount Hope area in the spring of 2001. As many as 76 wild horses were observed both inside and outside of the Whistler Mountain HMA in 1994. During a 1992 population inventory flight, 87 wild horses were observed in the Romano Allotment portion of the Whistler Mountain HMA. Numbers observed in population inventory flights since that time have been low, with the exception of 1998 when 44 wild horses were observed. The population levels and distribution of the horses are also influenced by the Roberts Mountain HMA, which was gathered in 1987, 1995, 2001, and 2008.

A total of approximately 8,943 acres of the Project are located within the Whistler Mountain HMA. **Approximately 12 percent of the Project Area (excluding the portion of the HMA that occurs within the fenced portion of the Project Area) is located within this HMA.**

Fish Creek HMA

The Fish Creek HMA is located a few miles south of Eureka, Nevada, in the Antelope and Little Smoky Valleys and in the Antelope and Fish Creek Mountains. The area is approximately 252,739 acres in size and is 25 miles wide and 28 miles long. However, a small portion of the HMA exists north of U.S. Highway 50, which is separated by highway ROW fences. This portion of the HMA is only 19,300 acres and is managed with the Whistler Mountain and Roberts Mountain HMAs.

The AML for the Fish Creek HMA was established through the **Final Multiple Use Decision (FMUD)** issued by the MLFO September 27, 2004, following the analysis of monitoring data and completion of the Fish Creek Complex Evaluation and Rangeland Health Assessment and Environmental Assessment (EA) #NV062-EA04-69. The total AML for the HMA was established as a range of 107 to 180 wild horses year round.

The portion of the Fish Creek HMA north of U.S. Highway 50 is located within the Kobeh Valley HA and neither the HMA nor the HA are extensively utilized by wild horses. Little water exists within HMA boundaries, and as a result, wild horses do not remain inside the HMA but move throughout Kobeh Valley and drift into the Whistler and Roberts Mountain HMAs. Figures 3.2.2 and 3.2.3 identify known surface water sources available to wild horses within and adjacent to the HMA. Due to lack of available water, a group of wild horses had to be removed from Kobeh Valley in 2001, in an emergency gather. There are no fences dividing the Fish Creek HMA from the Whistler Mountain HMA in Lucky C Allotment (northern portion). The AML for the northern portion of the Fish Creek HMA was established at six to ten wild horses, to account for the incidental use of wild horses in the area, and the lack of perennial water.

A total of approximately 333 acres of the Project are located within the Fish Creek HMA. **Approximately 1.5 percent of the Project Area (excluding the portion of the HMA that occurs within the fenced portion of the Project Area) is located within this HMA.**

Gather History

Four gathers have been completed within the Roberts Mountain HMA in 1987, 1995, 2001, and 2008. One gather was conducted between August 11 and 13, 1987, in which 120 wild horses were removed from within and outside of the HMA boundaries. The entire HMA was not gathered at that time, and the wild horses in the remainder of the HMA were left undisturbed.

The Roberts Mountain HMA was gathered between October 10 and 18, 1995. During this gather, a total of 344 wild horses were captured, and 170 were shipped to the Palomino Valley Center, on Pyramid Lake Highway approximately 20 miles north of Sparks, Nevada.

A total of 580 wild horses were captured in a gather conducted between July 13 and 23, 2001. At the end of the gather, 131 mares, foals and studs were released back to the HMA. During the 2001 wild horse gather on the Roberts Mountain HMA, 28 wild horses were removed from the Lucky C Allotment/Whistler HMA due to the lack of sufficient water (i.e., drought emergency). At the time, it was also estimated that between 60 and 80 wild horses may have moved into

Roberts Mountain HMA from the adjacent Whistler Mountain HMA and were gathered as part of the operation.

The most recent gather was completed between January 17 and 23, 2008. A total of 373 wild horses were captured in total from the Roberts Mountain HMA and Whistler Mountain HMA, with 25 mares and studs returned to the range. Most horses observed were very thin or emaciated due to limited forage and water available due to drought, compounded by deep snow throughout Kobeh Valley; only the healthiest horses were returned to the range.

Prior to 2008, no formal gathers of wild horses had been conducted within the Whistler Mountain HMA by the BLM. The population size of wild horses within the Whistler Mountain HMA is a product of gathers in adjacent areas. In 2001, 28 drought stressed horses were removed from the Whistler Mountain HMA in conjunction with the Roberts Mountain gather. The Kobeh Valley area outside the Fish Creek HMA was also gathered in 1994 at which time 129 horses were captured and 27 horses over the age of ten were released due to the selective removal policy. Gathers of the Kobeh Valley outside the Fish Creek HMA were also completed in 2008. In 2008, 30 wild horses were gathered and removed from the area.

Eleven groups of wild horses totaling 43 adults and nine foals were located during a population inventory in September 2008 in the area proposed to be fenced during the Project. The total 2011 wild horse population of the Roberts Mountain Complex, which includes Roberts Mountain, Whistler Mountain, and North Fish Creek HMAs and the Kobeh Valley HA is estimated to be 307. Population estimates for these HMAs are based on the average annual rate of increase in the HMAs of 17.5 percent.

3.13.3 Environmental Consequences and Mitigation Measures

3.13.3.1 Significance Criteria

Impacts to wild horses and burros would be considered significant if the Proposed Action or alternatives resulted in any of the following:

- Loss of acres, available forage, or water that results in substantial negative effects to the long-term health (including genetic variability) of the wild horses within the Roberts Mountain Complex; or
- Enhancement of, or interference, with the normal distribution and movement patterns of wild horses and burros within an HMA.

3.13.3.2 Assessment Methodology

The environmental consequences to wild horses in the Project Area were evaluated using available Project information. Potential impacts to the HMAs and wild horses were analyzed based on the current wild horse estimates in each of the areas, as well as the number of acres potentially affected by the Proposed Action.

In this environmental consequences discussion the Fish Creek HMA is not considered because 1) there are very few, if any, wild horses in the northern part of the Fish Creek HMA, 2) the northern end of the HMA was cut off by the U.S. Highway 50 fence, 3) there is very little water

on the northern end of the HMA, and 4) there is no direct effect of the Proposed Action to this HMA.

3.13.3.3 Proposed Action

3.13.3.3.1 Loss of Habitat, Available Forage, or Water

Approximately 14,204 acres of wild horse habitat would be directly removed as a result of the fence. Within the fenced area, approximately 13,998 acres are designated as one of two HMAs (Roberts Mountain HMA and Whistler Mountain HMA). A total of approximately 12,113.7 acres of the Project are located within the Roberts Mountain HMA, and approximately 7,836 acres would be excluded within this HMA as a result of the construction of the Project-boundary fence. A total of approximately 8,943 acres of the Project are located within the Whistler Mountain HMA, and approximately 6,162 acres would be excluded within this HMA as a result of the construction of the Project-boundary fence.

Project-related surface disturbance could also result in limiting wild horse access to developed and natural water sources located in the Project Area, and direct impacts could occur as a result of vehicular collisions along access roads. Section 3.2.3.3.1 discusses the specific affects to surface water resources.

Phreatophyte vegetation would potentially experience a change in species composition and percent cover due to the predicted water table drawdown associated with ground water pumping and subsequent recovery of the water table. Lowering of the water table in the area of phreatophytes is not expected to result in a net loss of vegetation in these communities. Additionally, reseeding mitigation proposed in Section 3.12.3 would **improve** the availability of forage for wild horses in areas identified by the BLM. Impacts to other vegetation communities as a result of drawdown are not expected. Therefore, impacts to overall wild horse forage as a result of the drawdown are not expected.

- **Impact 3.13.3.3-1:** Approximately 14,204 acres of wild horse habitat would be directly removed as a result of the fence. **Approximately 232 acres of wild horse habitat in the Project Area** would be potentially affected over the 44-year mine life and subsequent reclamation outside of the fenced portion of the Project, **excluding approximately 124 acres associated with the powerline portion of the Project Area and 50 acres associated with exploration. The location of the 50 acres of surface disturbance associated with exploration cannot be determined at this time. The location of the 124 acres of surface disturbance associated with the powerline would occur with the powerline portion of the Project Area; however, the exact location of this disturbance has not been specified yet. The exact number of acres of surface disturbance for these two Project features within each HMA cannot be calculated at this time.** Impacts to wild horses would also include a loss of access to water within the fenced portion of the Project Area. Impacts to wild horses could last approximately 70 years.

Significance of the Impact: The impact is considered significant for wild horse access to water.

- **Mitigation Measure 3.13.3.3-1:** Specific mitigation for surface water resources identified as being impacted by the Project is listed in Table 3.2-9. In order to further mitigate the loss of habitat and water sources to wild horses through the Project Area, EML would provide alternative water sources for wild horses. Six locations within the Whistler Mountain and Roberts Mountain HMAs have been identified in coordination with the BLM and would be developed as water sources for horses and could also be used by wildlife and livestock in areas historically used by wild horses (Figure 3.13.1). These sites consist of existing stock wells that are not currently functioning or do not have pumps or troughs and two new sources tapped from Project production wells. These sources would provide water where it has not been available previously or where availability has been limited. These sources would replace water sources located within the Project boundary fence that would no longer be available to wild horses. Distribution of wild horse use would also be improved. The Project's Mitigation Plan is included in this EIS as Appendix D.

The development of these six sites is detailed in Appendix D, Attachment 2. Appendix D, Attachment 2 includes a description of how each site would be developed. The sites would be owned and operated by EML. Operations would include periodic inspections and maintenance, turning water on and off, and winterizing water sources as determined through coordination with the BLM. Upon Project completion, improvements associated with the stock watering wells and spring would remain in place for the continued support of wild horses, wildlife, and livestock within the HMAs and grazing allotments. EML would implement the mitigation plan in Appendix D, Attachment 2. Should EML decide not to retain ownership of the associated water rights, agreements would be reached at that time between EML, and those associated with the current grazing privileges on the specific allotment(s), NDOW, and BLM to transfer ownership of these improvements to the appropriate parties.

The selection of new or replacement troughs and tanks would be based on design to reduce evaporation in the summer and reduce freezing in the winter. All pipelines from wellheads to the Project fenceline under this mitigation would be buried below the ground to avoid limiting wild horse movement.

If Project activities caused a water source to become unavailable to wild horses, the Authorized Officer could require a new well to be drilled or another water development to be constructed in the general area to provide adequate water for the wild horses. Should monitoring indicate that wild horses were being negatively impacted by the mining activities, the Mount Lewis Field Manager could require additional measures for the protection of wild horses such as seasonal restrictions during the peak foaling period. Mitigation could include annual, biennial, or quarterly helicopter population inventory flights of the area in addition to on the ground monitoring by BLM and Project personnel. However, the use of a helicopter below 500 feet would not occur between March 1 and June 30 in order to prevent disruption during foaling period, causing orphaned or abandoned foals.

Fences constructed around the Project Area would use white-topped steel posts. Additional reflectors may be necessary if problems with horses impacting fences occur. Fences should be continuous with no breaks (no drift fences). Horses climb steep or rocky terrain and may go around the ends of fences.

Should horses be discovered within the fenced areas, Project personnel would contact the BLM immediately to assist with the removal of the horses. Wild horses could be fence-wise and difficult to push through gates or fence openings. This often results in horses attempting to jump fences and becoming cut by barbed wire. BLM staff have materials to assist in the removal of wild horses. Project personnel would not "haze" wild horses out of fenced areas.

EML would avoid the BLM's Key Management Areas for vegetation monitoring established near Mount Hope and in Kobeh Valley.

Additional mitigation for livestock grazing and production is summarized in Appendix D.

- **Effectiveness of Mitigation and Residual Effects:** Implementation of Mitigation Measure 3.13.3.3-1 would be effective to reduce any impacts to the loss of habitat or resources within the HMA to less than significant. The Mitigation Plan would also ensure the effectiveness of this mitigation measure (Appendix D).

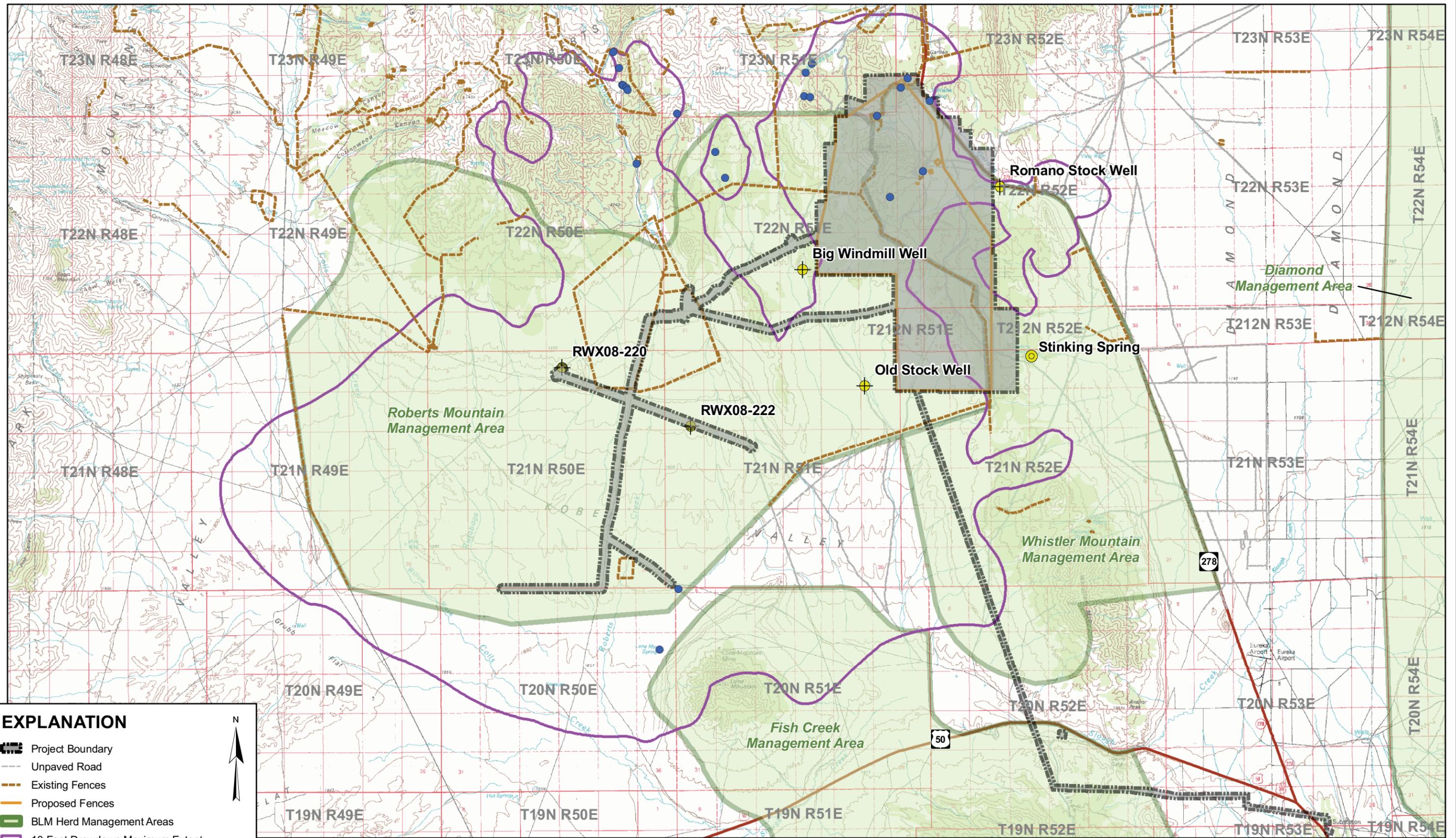
3.13.3.3.2 Impacts to the Normal Distribution and Movement Patterns of Wild Horses

Project-related activities could result in direct impacts to the movement patterns of wild horses. In order to minimize direct impacts to wild horses (i.e., wild horse-machinery collisions), a perimeter fence enclosing 14,204 acres would be constructed during Project activities in the general area, which includes the open pit, WRDFs, and TSFs. The construction of this fence would exclude wild horses during mine operation and reclamation for approximately 70 years. As described in the Proposed Action, the fence would be monitored on a regular basis and repairs made as needed. EML would assist, as requested, in moving these animals out of the Project Area. Construction of the fence would result in the movement of wild horses to other parts of the HMA potentially increasing the use of forage and water resources that may be already limited.

In addition, noise disturbance, human presence, and increased vehicular traffic would be continuous for approximately 44 years during implementation of the Proposed Action. Sudden loud noises such as blasts could cause wild horses to disperse in directions away from the sound. This behavior could send wild horses into unfamiliar terrain. Some wild horses may avoid the area while others may tolerate the noise and continue foraging and breeding activities in the vicinity of the Project Area.

Distribution changes could result in concentrations of wild horses using vegetation resources in certain areas and increased utilization levels. For example, increased human disturbance and unavailable land in the Whistler Mountain HMA and east portion of the Roberts Mountain HMA could result in the population shifting to the west portion of the Roberts Mountain HMA, resulting in larger numbers of wild horses using smaller land areas. As a result, upland forage species could be heavily utilized. Distribution changes could also result in reduced viewing opportunities by the public. Some impacts could occur to wild horses during the peak foaling season if widespread human activity disturbs the population. As a result, new foals could be orphaned or abandoned.

Potential impacts to the normal distribution and movement patterns of wild horses and burros are temporary in nature, and would not result in permanent displacement. Horses and some wildlife



EXPLANATION

- Project Boundary
- Unpaved Road
- Existing Fences
- Proposed Fences
- BLM Herd Management Areas
- 10-Foot Drawdown Maximum Extent

Potential Water Sources

- Well Water Source
- Spring or Seep Water Source
- Other Springs



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

0 1 2 3 4 5 6 7 Miles

IF THE ABOVE BAR DOES NOT SCALE 1 INCH, THE DRAWING SCALE IS ALTERED

BATTLE MOUNTAIN DISTRICT OFFICE
 Mount Lewis Field Office
 50 Bastian Road
 Battle Mountain, Nevada 89820

DESIGN: EMLLC	DRAWN: CVD/GSL	REVIEWED: RFD
CHECKED: -	APPROVED: RFD	DATE: 07/31/2012
FILE NAME: p1635_Fig3-13-1_WildHorseManagement.mxd		

BUREAU OF LAND MANAGEMENT
MOUNT HOPE PROJECT

DRAWING TITLE:
Wild Horse Management Areas and Water Development Areas
 Figure 3.13.1

species have shown the ability to adapt to the noise created by mines, road traffic, pumps, and even blasting.

- **Impact 3.13.3.3-2:** Project-related activities, such as the addition of a fence to the Project Area or noise from human presence, blasting, vehicular traffic, or other sources, associated with the Proposed Action could result in wild horse displacement and changes in wild horse use throughout the HMA for the 44-year Project life.

Significance of the Impact: The mitigation outlined above and in Appendix D, Attachment 2 would reduce the potential impacts to the distribution of wild horses. This impact is not considered significant.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.13.3.3.3 Residual Adverse Impacts

The Proposed Action would result in the unavoidable loss of 734 acres of wild horse foraging habitat resulting from surface disturbance in the open pit area. Approximately 14,204 acres of foraging habitat would be removed in the short term. The reclaimed land would have more grass and forb forage and less mature shrub forage in the short term.

The evaluation of the potential effects of the pit lake on wild horses used a SLERA. The general approach used in the preparation of the SLERA is similar to that developed by the Environmental Sciences Division and Life Sciences Division of Oak Ridge National Laboratory for the U.S. Department of Energy. In addition, the SLERA incorporated more recent TRVs for certain inorganic chemical constituents derived by the EPA (SRK 2009). Together, these were used to develop species-specific toxicity criteria to which the predicted constituents in the pit water were compared.

Protective criteria for the surrogate species are likely to be protective of local species occupying similar ecological niches at the Project Area. Additionally, it was assumed that the wildlife receptors would consume water from the pit lake; and, that this water would constitute 100 percent of each species individual daily water requirements (i.e., no outside sources of water would be utilized over the life of the animal). This is considered an extremely conservative assumption.

The results of the assessment indicate that the most likely predicted water quality of the modeled future pit lake water at the Project Area could represent a low to moderate toxicological threat to wild horses based on Nevada's beneficial use standard for livestock watering. However, since this water is not intended to be a livestock watering source **and livestock access would be restricted by the construction of the pit perimeter berm**, and the standards were based on limited toxicological information, the probable risk to wild horses from the pit lake under the Proposed Action would be low since wild horses could not access the pit lake.

3.13.3.4 No Action Alternative

Under the No Action Alternative, the proposed Project would not be developed and associated impacts to wild horses would not occur. EML would continue existing activities under

previously authorized Notices, and the area would remain available for future mineral development or for other purposes as approved by the BLM.

3.13.3.4.1 Residual Adverse Impacts

There would be no residual adverse impacts to wild horses under the No Action Alternative.

3.13.3.5 Partial Backfill Alternative

Impacts to wild horses would be similar to those described for the Proposed Action, however, the Partial Backfill Alternative would involve the partial backfilling of the open pit to eliminate the pit lake and the floor of the open pit would be reclaimed with growth media and seeded. Although the Proposed Action would have 734 acres that would remain unvegetated in the open pit, under this alternative approximately 527 acres would remain unvegetated following Project completion and reclamation; therefore, impacts to wild horses would be similar to, but less than, those described for the Proposed Action.

- **Impact 3.13.3.5-1:** Approximately 14,204 acres of wild horse habitat would be directly removed as a result of the fence. **Approximately 232 acres of wild horse habitat in the Project Area** would be potentially affected over the 44-year mine life and subsequent reclamation **outside of the fenced portion of the Project, excluding approximately 124 acres associated with the powerline portion of the Project Area and 50 acres associated with exploration. The location of the 50 acres of surface disturbance associated with exploration cannot be determined at this time. The location of the 124 acres of surface disturbance associated with the powerline would occur with the powerline portion of the Project Area; however, the exact location of this disturbance has not been specified yet. The exact number of acres of surface disturbance for these two Project features within each HMA cannot be calculated at this time.** Impacts to wild horses would also include a loss of access to water within the fenced portion of the Project Area.

Significance of the Impact: The impact is considered significant for wild horse access to water.

- **Mitigation Measure 3.13.3.5-1:** Mitigation under the Partial Backfill Alternative would be the same as mitigation under the Proposed Action.
- **Effectiveness of Mitigation and Residual Effects:** Implementation of Mitigation Measure 3.13.3.5-1 would reduce any impacts to the loss of acreage or resources within the HMA to less than significant.
- **Impact 3.13.3.5-2:** Project-related activities, such as the addition of a fence to the Project Area or noise from blasting or other sources, associated with the Partial Backfill Alternative could result in wild horse displacement and changes in wild horse use throughout the HMA for the life of the Project.

Significance of the Impact: The mitigation outlined above and in Appendix D, Attachment 2 would reduce the potential impacts to the distribution of wild horses.

Impacts from the Partial Backfill Alternative would be the same as impacts from the Proposed Action.

No mitigation is proposed for this impact; see Section 3.1.1 for a general discussion of significance and the development of mitigation measures.

3.13.3.5.1 Residual Adverse Impacts

The Partial Backfill Alternative would result in the unavoidable loss of 527 acres of wild horse foraging habitat resulting from surface disturbance in the open pit area. Approximately 14,204 acres of foraging habitat would be removed in the short term. The reclaimed land would have more grass and forb forage and less mature shrub forage in the short term.

3.13.3.6 Off-Site Transfer of Ore Concentrate for Processing Alternative

Although the Off-Site Transfer of Ore Concentrate for Processing Alternative would result in approximately 20 acres less surface disturbance compared to the Proposed Action, impacts to wild horses from this alternative would be similar to those for the Proposed Action since the acreage would decrease by only 0.2 percent.

- **Impact 3.13.3.6-1:** Approximately 14,204 acres of wild horse habitat would be directly removed as a result of the fence. **Approximately 232 acres of wild horse habitat in the Project Area** would be potentially affected over the 44-year mine life and subsequent reclamation **outside of the fenced portion of the Project, excluding approximately 124 acres associated with the powerline portion of the Project Area and 50 acres associated with exploration. The location of the 50 acres of surface disturbance associated with exploration cannot be determined at this time. The location of the 124 acres of surface disturbance associated with the powerline would occur with the powerline portion of the Project Area; however, the exact location of this disturbance has not been specified yet. The exact number of acres of surface disturbance for these two Project features within each HMA cannot be calculated at this time.** Impacts to wild horses would also include a loss of access to water within the fenced portion of the Project Area.

Significance of the Impact: The impact is considered significant for wild horse access to water.

- **Mitigation Measure 3.13.3.6-1:** Mitigation under the Off-Site Transfer of Ore Concentrate for Processing Alternative would be the same as mitigation under the Proposed Action.
- **Effectiveness of Mitigation and Residual Effects:** Implementation of Mitigation Measure 3.13.3.6-1 would reduce any impacts to the loss of acreage or resources within the HMA to less than significant. The Mitigation Plan would also ensure the effectiveness of this mitigation measure (Appendix D, Attachment 2).
- **Impact 3.13.3.6-2:** Project-related activities, such as the addition of a fence to the Project Area or noise from human presence, blasting, vehicular traffic, or other sources,

associated with the Proposed Action could result in wild horse displacement and changes in wild horse use throughout the HMA for the life of the Project.

Significance of the Impact: Impacts from the Partial Backfill Alternative would be the same as impacts from the Proposed Action. The mitigation outlined above and in Appendix D, Attachment 2 would reduce the potential impacts to the distribution of wild horses.

3.13.3.6.1 Residual Adverse Impacts

The Off-Site Transfer of Ore Concentrate for Processing Alternative would result in the unavoidable loss of 734 acres of wild horse foraging habitat resulting from surface disturbance in the open pit area. Approximately 14,204 acres of foraging habitat would be removed in the short term. The reclaimed land would have more grass and forb forage and less mature shrub forage in the short term. Impacts of the pit lake water toxicity to wild horses would be the same as the Proposed Action.

3.13.3.7 Slower, Longer Project Alternative

Impacts to wild horses from the Slower, Longer Project Alternative are expected to be similar to impacts from the Proposed Action at the end of the Project; however, impacts from the Slower, Longer Project Alternative would occur over a period approximately twice as long in duration compared to the Proposed Action.

- **Impact 3.13.3.7-1:** Approximately 14,204 acres of wild horse habitat would be directly removed as a result of the fence. **Approximately 232 acres of wild horse habitat in the Project Area** would be potentially affected over the extended mine life and subsequent reclamation **outside of the fenced portion of the Project, excluding approximately 124 acres associated with the powerline portion of the Project Area and 50 acres associated with exploration. The location of the 50 acres of surface disturbance associated with exploration cannot be determined at this time. The location of the 124 acres of surface disturbance associated with the powerline would occur with the powerline portion of the Project Area; however, the exact location of this disturbance has not been specified yet. The exact number of acres of surface disturbance for these two Project features within each HMA cannot be calculated at this time. Impacts to wild horses would also include a loss of access to water within the fenced portion of the Project Area. Impacts to wild horses could last approximately twice as long as the Proposed Action.**

Significance of the Impact: The impact is considered significant for wild horse access to water.

- **Mitigation Measure 3.13.3.7-1:** Specific mitigation for surface water resources that has been identified as being impacted by the Project is listed in Tables 3.2-9 and 3.2-18. Otherwise, the mitigation under the Slower, Longer Project Alternative would be the same as mitigation under the Proposed Action.
- **Effectiveness of Mitigation and Residual Effects:** Implementation of Mitigation Measure 3.13.3.7-1 would reduce any impacts to the loss of acreage or resources within

the HMA to less than significant. The Mitigation Plan would also ensure the effectiveness of this mitigation measure (Appendix **D, Attachment 2**).

- **Impact 3.13.3.7-2:** Project-related activities, such as the addition of a fence to the Project Area or noise from blasting or other sources, associated with the Slower, Longer Project Alternative could result in wild horse displacement and changes in wild horse use throughout the HMA for the duration of the Project, which would be twice as long as the Proposed Action.

Significance of the Impact: Impacts from the Slower, Longer Project Alternative would be the same as impacts from the Proposed Action. The mitigation outlined above and in Appendix **D, Attachment 2** would reduce the potential impacts to the distribution of wild horses.

3.13.3.7.1 Residual Adverse Impacts

The Slower, Longer Project Alternative would result in the unavoidable loss of 734 acres of wild horse foraging habitat resulting from surface disturbance in the open pit area. Approximately 14,204 acres of foraging habitat would be removed during Project activities. The reclaimed land would have more grass and forb forage and less mature shrub forage.

3.14 Land Use

3.14.1 Regulatory Framework

The NEPA requires the consideration of local plans and policies in the assessment of the social and environmental effects of proposals involving federal lands. Federal, state, and local plans and guidelines that apply to land use authorizations and access within the study area include the following: Shoshone-Eureka RMP; 2010 Eureka County Master Plan, including the updated Natural Resources and Federal or State Land Use (Natural Resource and Land Use Plan) and Economic Development elements; and the Land and Resource Management Plan for the Toiyabe National Forest.

The Shoshone-Eureka RMP serves as the guiding policy document for BLM administered lands surrounding the Project Area. The ROD included the following objective relevant to the Proposed Action:

Assure that mineral exploration, development and extraction are carried out in such a way as to minimize environmental and other resource damage and to provide, where legally possible, for the rehabilitation of lands.

The ROD also included the following Management Decision under Locatable Minerals:

All public lands in the planning areas would be open for mining and prospecting unless withdrawn or restricted from mineral entry.

The Growth Management, Public Facilities and Services and Economic Development elements of the 2010 Eureka County Master Plan outline goals that pertain to the Project and include the following: