

3.9 Vegetation Resources

This section addresses vegetation resources in and near the Project Area including information on plant communities. Wetland and riparian areas are discussed in Section 3.11.

3.9.1 **Regulatory Framework**

3.9.1.1 Endangered Species Act

The Federal ESA of 1973, as amended, safeguards the continued existence of any species classified as “endangered” or “threatened,” as well as habitat that is determined by the Secretary of the Interior to be critical to such species. The ESA is administered by the U.S. Fish and Wildlife Service (USFWS), in consultation with other federal and state agencies. The ESA defines the following terms:

- Endangered species: “... any species which is in danger of extinction throughout all or a significant portion of its range...”
- Threatened species: “... any species which is likely to become an endangered species within the foreseeable future...”
- Critical habitat: “... the specific areas within the geographical area occupied by the species... on which are found those physical or biological features (i) essential to the conservation of the species, and (ii) which may require special management considerations or protection...”

The ESA prohibits the “take” (i.e., killing, harming, or harassment) of listed threatened or endangered species without special exemptions. Candidate species are species for which the USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities. Analogous to the ESA, NRS 527.270 prohibits removal or destruction of species listed as “threatened with extinction” except by special permit from the Nevada Division of Forestry (NDF).

In addition to listed threatened, endangered, and candidate species, the USFWS identifies another group of species known as species of concern (formerly candidate, category 2 species). Species of concern are not specifically afforded the same protection under the ESA as threatened and endangered species, but federal agencies are required to afford them consideration in planning and decision-making processes. The BLM evaluates species of concern in a manner analogous to threatened and endangered species. On May 1, 1996, the NSO incorporated all former USFWS-designated category 2 candidate species into the Nevada Special Status Species List and classified them as sensitive. Sensitive species are protected by BLM policy, which requires that actions authorized, funded, or carried out by the agency do not contribute to the listing of any candidate or sensitive species as threatened or endangered under the ESA. A list of BLM sensitive species is included as Appendix F.

3.9.1.2 Nevada Natural Heritage Program

The Nevada Natural Heritage Program (NNHP) maintains a computerized inventory of information on the general location and status of Nevada’s sensitive plants, animals, and natural biological communities. The NNHP tracks state and federally protected species as well as

species that the scientific community considers deserving of official listing. The information is derived from reported sightings only, and does not cover every project location.

3.9.1.3 Nevada Native Plant Society

The Nevada Native Plant Society (NNPS) is a non-profit organization that functions in an advisory capacity to state and federal agencies regarding Nevada native plants and their distributions. The NNPS has created six categorical designations of plants to identify their respective concern for these species. These designations do not afford legal status or protection for the species, but the lists produced by NNPS are utilized by agencies in their planning processes for activities that may impact the species or habitat. The listing categories include the following:

- Endangered: Believed to meet the ESA definition of endangered.
- Threatened: Believed to meet the ESA definition of threatened.
- Watch-list: Potentially vulnerable to becoming threatened or endangered.
- Possibly Extirpated: Historically native to Nevada, but may no longer survive in the wild.
- Absent: Currently and historically absent from Nevada, listed in the past but not now of concern.
- Delisted: Dropped from consideration, no longer of concern to NNPS.

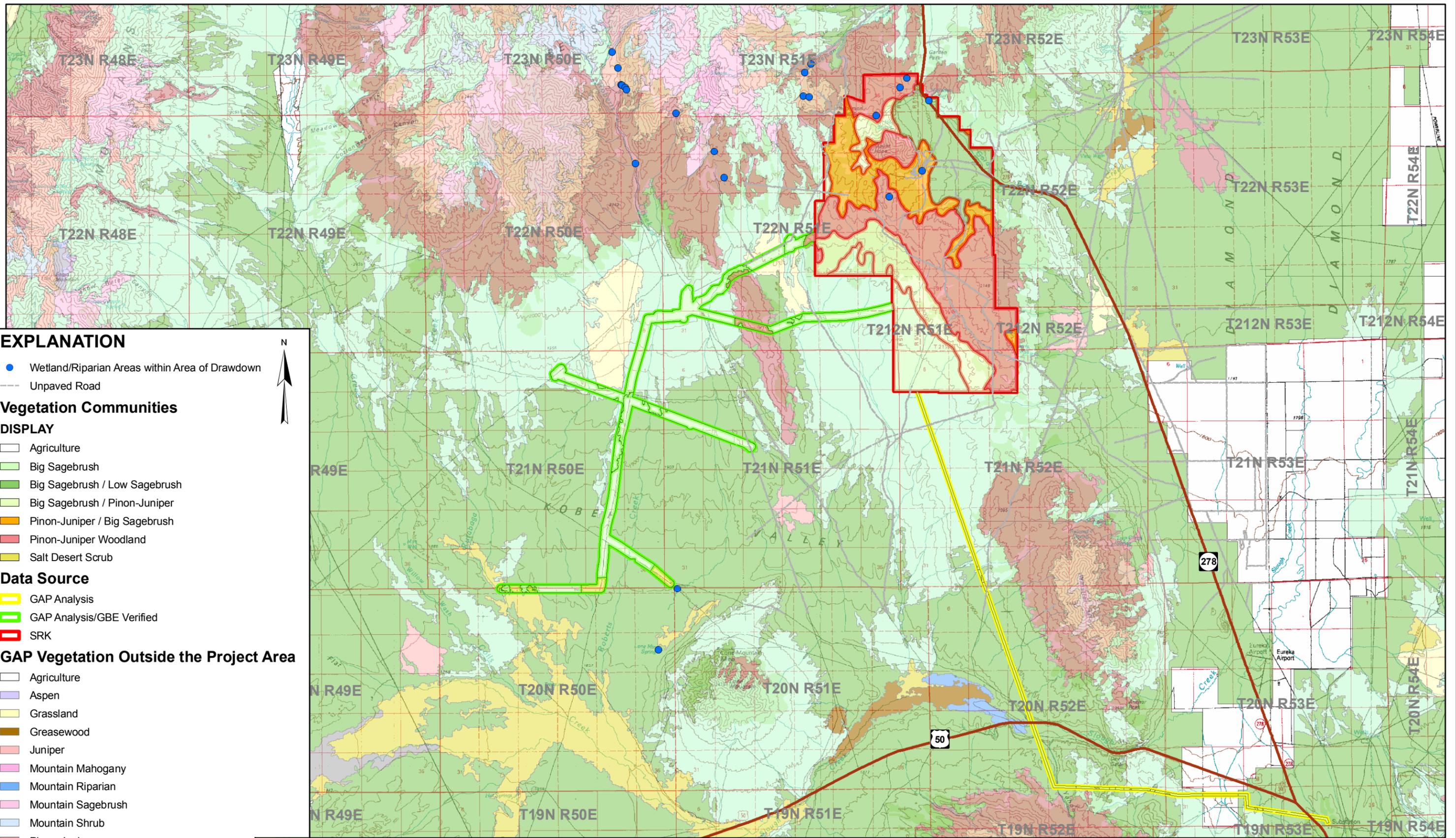
3.9.2 **Affected Environment**

3.9.2.1 Study Methods

The NRCS soil surveys were reviewed to obtain existing vegetation data for the area and potential natural vegetation and ecological site descriptions (SRK 2007b). A gross scale mapping effort of the vegetation in the majority of the Project was conducted by aerial survey (helicopter) on April 28, 2006, and ground surveys (SRK 2007b). Figure 3.9.1 shows the vegetation types in the Project Area. An additional survey for biological resources, including vegetation, was conducted on July 1 and 2, 2008 (Great Basin Ecology 2008). Phreatophytic vegetation was mapped in the Project Area and vicinity and is shown on Figures 3.2.20 and 3.9.2.

Baseline survey information for special status species in the Project Area was requested from the NNHP and the USFWS. The lists provided by the NNHP and the USFWS identified the following plant species with potential to occur within the region: Beatley buckwheat (*Eriogonum beatleyae*), an imperiled species; and least phacelia (*Phacelia minutissima*), a BLM sensitive species. Additionally, windloving buckwheat (*Eriogonum anemophilum*), a BLM sensitive species, was identified as potentially occurring in the Kobeh Valley portion of the Project Area. The Monte Neva Indian paintbrush (*Castilleja salsuginosa*), a BLM sensitive species, is located approximately two miles southwest of the southern extent of the ten-foot drawdown.

Special status plant surveys were conducted in the majority of the Project Area by SRK on June 30, 2005, and during the bloom period in 2006 (SRK 2007b). Field surveys were also conducted in the well field, powerline, and transmission line areas in mid-July and August 2007 (SRK 2007c). A final special status plant survey in the Kobeh Valley portion of the Project Area was conducted on July 1 and 2, 2008 (Great Basin Ecology 2008). Vegetation in the powerline portion of the Project Area was obtained from the Southwest Regional Gap Analysis Project database maintained by the EPA (<http://www.epa.gov/nerlesd1/land-sci/gap.htm>).



EXPLANATION

- Wetland/Riparian Areas within Area of Drawdown
- Unpaved Road

Vegetation Communities

DISPLAY

- Agriculture
- Big Sagebrush
- Big Sagebrush / Low Sagebrush
- Big Sagebrush / Pinon-Juniper
- Pinon-Juniper / Big Sagebrush
- Pinon-Juniper Woodland
- Salt Desert Scrub

Data Source

- GAP Analysis
- GAP Analysis/GBE Verified
- SRK

GAP Vegetation Outside the Project Area

- Agriculture
- Aspen
- Grassland
- Greasewood
- Juniper
- Mountain Mahogany
- Mountain Riparian
- Mountain Sagebrush
- Mountain Shrub
- Pinon-Juniper
- Pinon
- Playas
- Sagebrush
- Sagebrush/Perennial Grass
- Salt Desert Scrub



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 Battle Mountain, Nevada 89820

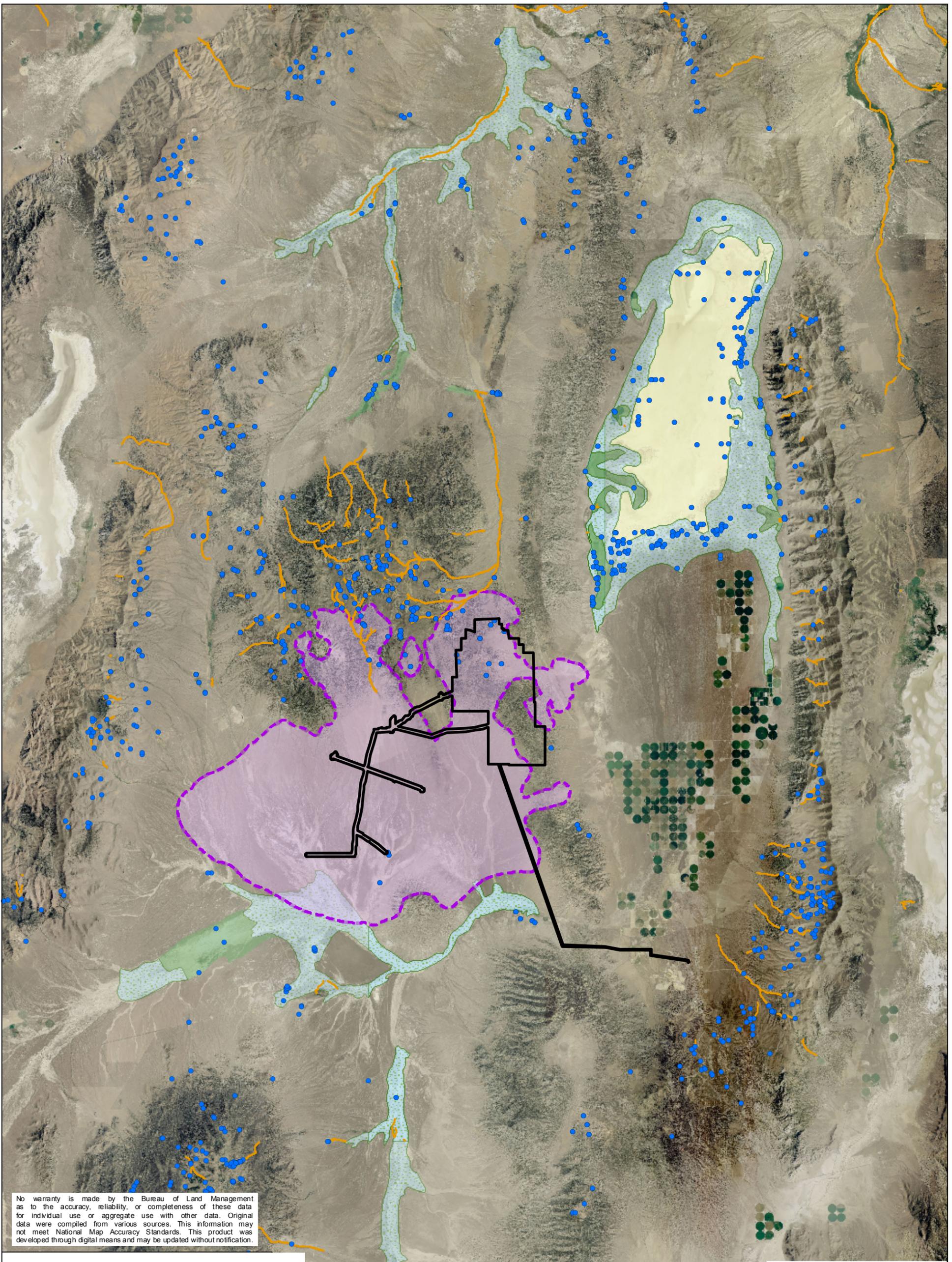
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MOUNT HOPE PROJECT

DRAWING TITLE:

Vegetation Communities and Wetland/Riparian Areas

Figure 3.9.1



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EXPLANATION

Phreatophytes

- Mainly Greasewood and Rabbitbrush
- Mainly Saltgrass and Meadow Grasses
- Playa
- Springs
- Perennial Streams
- 10-Foot Drawdown Maximum Extent
- Project Area Boundary



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**Existing Phreatophyte
Vegetation**
Figure 3.9.2



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3.9.2.2 Existing Conditions

3.9.2.2.1 Vegetation Community Types

Vegetation community types identified within the Project Area include the following: big sagebrush; piñon-juniper woodland; big sagebrush/piñon-juniper; piñon-juniper/big sagebrush; big sagebrush/low sagebrush; salt desert scrub; juniper; and agricultural lands (Figure 3.9.1). Table 3.9-1 summarizes the vegetation community types located within the Project Area.

Table 3.9-1: Vegetation Community Types within the Project Area

Vegetation Community	Elevational Range (feet amsl)	Acres within the Project Area	Percent within the Project Area
Piñon-Juniper	6,200-8,600	6,895.6	31.1
Big sagebrush	5,700-8,600	6,445.5	29.1
Big Sagebrush/Piñon-Juniper	5,500-7,500	2,996.1	13.5
Piñon-Juniper/Big Sagebrush	6,200-7,000	2,902.3	13.1
Big Sagebrush/Low Sagebrush	5,900-6,800	2,643.2	11.9
Salt Desert Scrub	5,900-6,200	261.4	1.2
Agricultural Land	6,014-6,043	33.2	0.1
Total	NA	22,177.3	100

Big Sagebrush Vegetation Type

The big sagebrush vegetation type is present on alluvial fans, hillsides, and ephemeral drainages and occurs in Akercan (440), Coils (280), Labshaft-Rock, and Rubyhill-Barrier (601) associations found within the Project Area. All soil associations within the Project Area are described in Section 3.8. This vegetation type occurs at elevations between 5,700 and 8,600 feet amsl. The existing dominant overstory vegetation, depending on the location, could be either basin big sagebrush (*Artemisia tridentata* spp. *tridentata*), Wyoming big sagebrush, or mountain big sagebrush (*Artemisia tridentata* spp. *vaseyana*). Understory species commonly associated with basin big sagebrush includes bottlebrush squirreltail (*Elymus elymoides*), rabbitbrush (*Ericameria nauseosa* and *Chrysothamnus* ssp.), and Sandberg bluegrass (*Poa secunda*).

Rabbitbrush, Indian ricegrass (*Achnatherum hymenoides*), green ephedra (*Ephedra viridis*), and cheatgrass occur with Wyoming big sagebrush. Species occurring with mountain big sagebrush include bluebunch wheatgrass (*Pseudoroegneria spicata*), Sandberg bluegrass, cheatgrass, bottlebrush squirreltail, lupine (*Lupinus* spp.), and scattered rabbitbrush and antelope bitterbrush (*Purshia tridentata*). The Wyoming big sagebrush type is a prevalent vegetation type accounting for 7,744.2 acres (32.9 percent) of the Project Area and generally dominates the lower to mid-elevation zones in the Kobeh Valley and along Garden Pass Road.

Based on the NRCS soil surveys and ecological site descriptions for upland vegetation communities, the current vegetation type is more shrub dominated than the potential natural vegetation described in the ecological site description (SRK 2007b). For most ecological sites in this type, grass species have the potential to comprise over 50 percent of vegetative composition with shrubs being at or below 50 percent of the total composition. Species composition is extremely similar to the potential natural vegetation species; however, percentages of

composition are skewed toward shrub dominance. Big sagebrush, antelope bitterbrush, rabbitbrush, bluebunch wheatgrass, Indian ricegrass, Thurber's needlegrass (*Achnatherum thurberianum*), bottlebrush squirreltail, black sagebrush (*Artemisia nova*), bud sagebrush (*Artemisia spinescens*), and winterfat (*Krascheninnikovia lanata*) are potential natural vegetation species occurring on the four soil associations mentioned above.

Piñon-Juniper Vegetation Type

Piñon-juniper woodlands generally occur on steep hillsides and mountains at all aspects, between 6,200 and 8,600 feet amsl. This vegetation type generally occurs on shallow, loamy soils with high percentages of coarse fragments. Singleleaf piñon (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*) dominate the overstory in this type. The understory is often nothing more than barren soil in dense stands of this vegetation type. Piñon-juniper woodlands occur in Mau-Shagnasty-Eightmile (321), Labshaft-Rock outcrop complex, and Ratto soil associations. Shrubs present include mountain big sagebrush, basin big sagebrush, Wyoming big sagebrush, antelope bitterbrush, black sagebrush, and rabbitbrush. Grasses including Sandberg bluegrass, bottlebrush squirreltail, Thurber's needlegrass, Idaho fescue (*Festuca idahoensis*), basin wildrye (*Leymus cinereus*), and bluebunch wheatgrass are present in the generally sparse understory. These woodlands typically occur along the north south trending mountains above elevations of 6,700 feet amsl and were present in approximately 6,913.6 acres (29.4 percent) of the Project Area.

According to the NRCS ecological site description for the Mau-Shagnasty-Eightmile association, the potential natural vegetation for the sites currently vegetated by piñon-juniper woodlands includes Thurber's needlegrass, bluebunch wheatgrass, and big sagebrush. No potential native vegetation was documented for Ratto and Labshaft-Rock outcrop complex associations. For the Mau-Shagnasty-Eightmile association, the potential natural vegetation has been largely replaced with piñon-juniper woodlands. This encroachment by piñon-juniper woodlands implies a lack of fire in the area. Since the advent of fire suppression, there has been a migration of piñon-juniper habitat into sagebrush steppe communities.

Approximately 41.3 acres of the Project Area is located in the juniper vegetation type, which is dominated by Utah juniper and consists of understory vegetation similar to the piñon-juniper vegetation type.

Big Sagebrush/Piñon-Juniper Vegetation Type

The big sagebrush/piñon-juniper vegetation type occurs within and surrounding the Project Area. This vegetation type constitutes up to 12.7 percent (2,996.1 acres) of the vegetation within the Project Area and is located just north of the proposed open pit location and along the bench of the Whistler Range on the Kobeh Valley side. Islands of piñon-juniper woodlands and scattered trees occur throughout the big sagebrush in this vegetation type and indicate an encroachment of piñon-juniper woodlands into the big sagebrush type. This vegetation type comprises the following soil associations: Chad-Cleavage-Softscrabble (681), Mau-Shagnasty-Eightmile, and Labshaft-Rock outcrop complex. The elevation for this vegetation type ranges from 5,500 to 7,500 feet amsl. The big sagebrush/piñon-juniper vegetation type is typically found on hillsides, alluvial fans, and benches. Understory vegetation found within this existing type include bluebunch wheatgrass, Sandberg bluegrass, bottlebrush squirreltail, basin wildrye, Idaho fescue,

and Thurber's needlegrass. Shrub and overstory species include big sagebrush, Nevada ephedra (*Ephedra nevadensis*), and serviceberry (*Amelanchier* spp.).

The soil associations found in the area of this vegetation indicates that the potential natural vegetation was historically a grass dominated vegetation type with sagebrush and other shrubs in percentages of no more than 25 percent; however, no data are available for the potential natural vegetation for the Labshaft-Rock outcrop association to compare to the existing vegetation type.

Piñon-Juniper/Big Sagebrush Vegetation Type

The piñon-juniper/big sagebrush vegetation type is commonly found in the north and central portions of the Project Area and makes up approximately 12.3 percent (approximately 2,902.3 acres) of the Project Area. This vegetation type is typically found at elevations between 6,200 and 7,000 feet amsl, and is dominated by piñon-juniper woodlands with many inclusions of big sagebrush located throughout. Existing understory vegetation includes Nevada ephedra, Sandberg bluegrass, bluebunch wheatgrass, bottlebrush squirreltail, Idaho fescue, basin wildrye, cheatgrass, and Indian ricegrass. Overstory species including rabbitbrush and low sagebrush (*Artemisia arbuscula*) are also present but not dominant.

Grasses are a large percentage of the potential natural vegetation occurring within the Labshaft-Rock outcrop complex, Handy (922), Atrypa (830), Shagnasty-Ravenswood-Rock outcrop (764), and Chad-Cleavage-Softscrabble (681) associations where the existing piñon-juniper/black sagebrush vegetation type occurs. The potential natural vegetation for the Atrypa association includes piñon, juniper, and big sagebrush. This potential natural vegetation is similar to the existing vegetation type of all the soil associations present. Soil map unit 681 should have 45 percent grass and 45 percent shrub composition for the potential natural vegetation, whereas the other associations have a grass composition up to 65 percent and no lower than 55 percent. The existing vegetative community (woodland/shrub community) has transitioned to a later seral stage from that of a grass-dominated area. Potential native vegetation understory and overstory species at these sites include bluebunch wheatgrass, Thurber's needlegrass, low sagebrush, black sagebrush, goldenweed (*Haplopappus acaulis*), big sagebrush, Utah juniper, singleleaf piñon, Indian ricegrass, needle and thread grass (*Hesperostipa comata*), Nevada bluegrass (*Poa nevadensis*), bottlebrush squirreltail, and black greasewood (*Sarcobatus vermiculatus*).

Big Sagebrush/Low Sagebrush Vegetation Type

A substantial portion (2,643.2 acres and 11.2 percent) of the Project Area is vegetated by the big sagebrush/low sagebrush type. This type occurs on the alluvial fans, hillsides, and bottom areas in the northeastern section of the Project Area and extends beyond the Project boundary to the east toward Diamond Valley where the type is bound by Garden Pass Creek. This type occurs at lower to mid-elevations, which range from 5,900 to 6,800 feet amsl. Islands of low sagebrush occur within the big sagebrush community with occasional Utah juniper in the area. Other overstory species found in the existing community include Nevada ephedra and rabbitbrush. Dominant understory vegetation species found in this type include squirreltail and Indian ricegrass. The big sagebrush/low sagebrush type is solely found in the Ratto soil association. The Project Area is located within the NRCS 028BY010NV MLRA. The NRCS rangeland ecological site description for this MLRA identifies Wyoming big sagebrush as the dominant shrub species, with other species of trees and shrubs including Douglas' rabbitbrush, fourwing saltbush (*Atriplex canescens*), Nevada ephedra, spiny hopsage (*Grayia spinosa*), and Utah juniper. The

NRCS also identifies Indian ricegrass and needle and thread as the dominant grasses in this MLRA, with other grasses including bottlebrush squirreltail, Sandberg's bluegrass, western wheatgrass, and basin wildrye. Forbs include globemallow (*Sphaeralcea* sp.), phlox (*Phlox* sp.), and paintbrush.

Salt Desert Scrub Vegetation Type

The salt desert scrub vegetation type generally occurs in saline areas along drainages, margins of lake beds and marshes, and on flats and basins at elevations between 5,900 and 6,200 feet amsl. Phreatophytic vegetation is typically located in this vegetation type. Black greasewood dominates the south end of Kobeh Valley and comprises approximately 261.4 acres, or 1.1 percent of the Project Area. Associated species in the area include rabbitbrush, halogeton (*Halogeton glomeratus*), spiny hopsage, shadscale saltbush (*Atriplex confertifolia*), iodine bush (*Allenrolfea occidentalis*), and saltgrass. Low sagebrush also occurs as inclusions throughout the greasewood community and transitions to low sagebrush communities where there is elevated clay content in soils (Great Basin Ecology 2008).

Agricultural Land

Approximately 33.2 acres of the Project Area is located on private agricultural land along the proposed powerline route. This vegetation type is cultivated, and is therefore altered from natural conditions, and constitutes approximately 0.1 percent of the Project Area.

Vegetation Types Located Outside of the Project Area

Additional vegetation communities located outside of the Project Area have the potential to be indirectly impacted by the Project. These communities include agricultural lands that are located outside of the Project Area in the Roberts Creek drainage and phreatophytic vegetation. Phreatophytic vegetation as described in Section 3.2.2.6.5 includes plants that send their roots in to the water table and depend on a constant supply of ground water. The mapped locations of phreatophytic vegetation in the Project Area and vicinity are illustrated on Figures 3.2.20 and 3.9.2.

3.9.2.2.2 Special Status Plant Species

The Project Area contains limited acreage of potentially suitable habitat for Beatley buckwheat. Although several species of buckwheat were identified in the Project Area, including locations on or around the rock outcrops, Beatley buckwheat was not among the species identified. Round headed desert buckwheat (*Eriogonum sphaerocephalum*), umbrella desert buckwheat (*E. umbellatum*), and parsley desert buckwheat (*E. heracleoides*) were the species observed in the Project Area (SRK 2007b).

The claypan soils located on the valley floor and the volcanic ridge located in the eastern portion of the proposed well field in Kobeh Valley were identified as potential habitat for windloving buckwheat. Potential habitat in the Project Area was surveyed and no windloving buckwheat individuals were located.

No occurrences of least phacelia were identified during the survey. Most of the drainages in the Project Area are ephemeral drainages serving as channels for storm water drainage and spring

snow melt. The associated species, false hellebore (*Veratrum viride*), mule's ear (*Wyethia amplexicaulis*), and aspen, were also not found in the Project Area. Only five springs were located in the Project Area. Garden Pass Spring, located in the northeast portion of the Project Area, has been developed into a stock pond. The soil was heavily compacted and devoid of vegetation due to wild horse use. A second "spring" was located on the east slope of Mount Hope. This "spring" consisted of a pipeline extending from an historic adit. The pipeline transported a portion of the flow to a stock pond that was in similar condition to the Garden Pass Spring stock pond. Neither site provided suitable habitat for least phacelia. Mount Hope Spring was dry, with extensive piñon-juniper and sagebrush dominating the site. No other suitable habitat was observed during the survey (SRK 2007b).

The Monte Neva Indian paintbrush, a Nevada endemic, has not been located within the Project Area; however, the BLM and NNHP have identified this species as occurring at a location that is approximately two miles southwest of the southern extent of the ten-foot drawdown just north of U.S. Highway 50 near Hot Springs Hill between Lone Mountain and 3 Bars Road outside the Project Area boundary. Focused surveys for the Monte Neva Indian paintbrush were not conducted in the Project Area because suitable habitat for this species is not located within the Project Area. This is one of the two known populations of this species in Nevada. The NNHP describes potential habitat for the Monte Neva Indian paintbrush as damp, open, alkaline to saline clay soils of hummocks and drainages on travertine hot-spring mounds with greasewood, rubber rabbitbrush, and alkali sacaton (<http://heritage.nv.gov/atlas/castisalsu.pdf>).

3.9.2.2.3 Wildland Fire Prevention and Control

Historically, the approach to fire management has been one of full or modified suppression for all wildland fires on public lands; therefore, very limited use of prescribed fire or fuels management has occurred. The past practice of fire suppression has led to the development of a dense overstory that inhibits the existence of a healthy native herbaceous understory. This practice has also resulted in creating a high level of fire fuel hazards. As a result, there have been numerous and extensive wildland fires in the recent past and greater emphasis has now been placed on wildland fire rehabilitation and hazardous fuels reduction. New national direction is outlined in the Review and Update of the 1995 Federal Wildland Fire Management Update (2001 Federal Fire Policy). In addition, the National Fire Plan (NFP) provides for implementation of hazardous fuel reduction activities such as those outlined in the Healthy Forests Initiative and Healthy Forests Restoration Act. Congress has provided funds to address hazardous fuels management issues and to re-introduce fire into fire dependent ecosystems.

BLM fire management activities include the creation of fuel breaks via mechanical thinning, by the BLM, adjacent to key vegetative communities prior to conducting prescribed fire. Activity fuels created by vegetation removal are either piled and burned or chipped. Pile burning disposal involves the burning of piles of specific size and fuel size distribution. BLM fire management activities also include treatment with prescribed fire followed by seeding. A combination of ignition devices are used including helitorches, terra torches, drip torches, fuses, flare guns, and hand thrown ignition devices. The size of burn areas are limited by the existing and planned fuel breaks, time of day and season of ignition, live fuel moisture variations as a result of changes in elevation, and firing patterns.

3.9.2.2.4 Climate Change

Vegetation composition is integral to many native cultures. Potential changes in vegetation associated with projected effects of climate change may alter the availability of plants for traditional use purposes. Climate change contributes to changes in stream systems, such as flow, temperature, and turbidity. It is predicted that climate change will exacerbate the effects of land management activities to streams and aquatic habitats. Changes in climate can influence the timing and length of seasons, which in turn can have a direct effect on plants and animals. This includes changes in ranges, abundances, phenology (timing of an event such as breeding), morphology and physiology, community composition, biotic interactions and behavior. Changes are being seen in all different types of taxa, from insects to mammals, in North America as well as on many other continents. Climate change is contributing to effects on glacial systems, which are advancing or receding, depending on local conditions.

Climate change predictions include increased duration and frequency of droughts and an increase in extreme precipitation events. This combination can result in an increase of surface soil erosion and gullying beyond current levels. Continental scale shifts in precipitation may lead to areas where there are increases and decreases in soil moisture. Prolonged drought would also affect soil respiration, resulting in a decreased soil carbon pool. Climate change (warmer/drier summer conditions, warmer winters) may be one of the factors in recently observed changes in forest health involving large areas of tree mortality from a variety of insect agents. Many forest communities are resilient in responding to normal variations in weather and climate to which they are adapted. However, currently occurring increases in forest insect infestations and tree mortality throughout the Planning Area may be partially due to global climate change acting in concert with other variables such as long-term fire suppression, particularly in areas where stands are overstocked. Due to changes in climate, grasslands and rangeland could expand into previously forested areas. Additionally, sagebrush habitats may decline sharply throughout the region and be replaced with grasslands. Increasing CO₂ concentrations also lead to preferential fertilization and growth of specific plant species, such as invaders like cheat grass. Climate change may favor certain shrub species, both native and exotic. Increased CO₂ in the atmosphere may favor growth of most woody plants and “cool-season” grasses at the expense of “warm season grasses.” These and other differences among species could lead to changes in the composition of rangeland vegetation, but generalizations are difficult. Climate change affects the water cycle through decreased snow pack, runoff timing, and changes to total runoff volumes. Increased frequency of high intensity rainfall events related to global climate change could result in increased stream sedimentation or alteration of stream channels.

3.9.3 Environmental Consequences and Mitigation Measures

The environmental consequences of the Proposed Action and each alternative as they relate to vegetation resources are discussed in this section.

3.9.3.1 Significance Criteria

Based upon NEPA guidelines and commonly accepted criteria, the Proposed Action or alternatives would normally be considered to have a significant effect on vegetation resources if the following occurred:

- Substantially affect a species or habitat afforded protection under either the ESA or state law, or designated as having special status (e.g., species of concern, sensitive species, etc.) by an overseeing agency;
- Eliminate, reduce, or adversely affect a unique or rare natural plant community within the Project Area;
- Failure of reclamation efforts to achieve a stable, perennial vegetation cover that protects disturbed soil surfaces against erosion; or
- Establish plant communities on the reclaimed areas that fail to meet the reclamation objective for providing suitable forage for livestock, wildlife, and wild horses.

3.9.3.2 Assessment Methodology

Potential effects on vegetation resources can be categorized as direct and indirect, as well as short term (i.e., during the life of the Project) and long term. Direct effects on vegetation resources would include temporary and permanent loss of vegetation associated with construction, operation, and maintenance of the Project. Additional direct effects from the Project could include degradation of vegetation due to trampling, soil compaction, spills, increased access, and introduction of noxious weeds and invasive and nonnative species. Indirect effects could occur as a result of water table decline. Short-term impacts are those that could occur during Project implementation and until reclamation is complete. Long-term impacts are those occurring after reclamation is complete. The effects are determined to be significant or not significant based on the applicable significance criteria listed in Section 3.9.3.1.

3.9.3.3 Proposed Action

3.9.3.3.1 Vegetation Communities Disturbed by the Proposed Action

Implementation of the Proposed Action would result in the temporary disturbance or loss of up to 8,318 acres of vegetation over the 44-year mine life. Table 3.9-2 indicates the types of plant communities that could be impacted within the Project Area boundary. None of the eight vegetation communities located in the Project Area are considered unique with regard to the area's known resources, as they represent some of the most common vegetation types in northern Nevada. Under the Proposed Action, eight plant communities (big sagebrush, piñon-juniper, big sagebrush/ piñon-juniper, piñon-juniper/big sagebrush, big sagebrush/low sagebrush, salt desert scrub, and juniper) would be disturbed. Disturbance acreages are presented in Table 3.9-2.

Table 3.9-2: Areas of Vegetation Communities Disturbed or Removed by Project Components

Vegetation Community Types	Total Project Disturbance ²	Percent of Total Project Disturbance
Big sagebrush	1,920.4	23.24
Piñon-juniper	1,405.0	17.01
Big sagebrush/ Piñon-juniper	2,199.6	26.62
Piñon-juniper/Big sagebrush	1,895.1	22.94
Big sagebrush/ Low sagebrush	832.9	10.08
Salt Desert Scrub	6.1	0.07
Agricultural	3.3	0.04

Vegetation Community Types	Total Project Disturbance ²	Percent of Total Project Disturbance
Undetermined (unspecific exploration activities) ¹	50.0	-
Total Disturbance Acreage	8,312.4	100.0

¹ Up to 50 acres of exploration surface disturbance may occur under the Proposed Action. Site-specific reviews/approvals would be coordinated with the BLM.
² Discrepancies between this table and Table 2.1-1 are a result of rounding. Since the location of exploration areas cannot be determined at this time, the impact of that disturbance has not been calculated.

As indicated in Table 3.9-2, the vegetation community with the largest impact from Project-related surface disturbance would be the big sagebrush community, with 28.8 percent of the total surface disturbance occurring in that community. The disturbance would be associated with the construction of the North TSF, South TSF, the Kobeh Valley Well Field, and the powerline. Approximately 24.5 percent of the surface disturbance would occur in the big sagebrush/piñon-juniper community, and 20.6 percent would occur in the piñon-juniper/big sagebrush vegetation community, 16.3 percent would occur in the piñon-juniper vegetation community, and 9.1 percent would occur in the big sagebrush/low sagebrush vegetation community. Approximately 0.5 percent of disturbance would occur in the salt desert scrub community and 0.02 percent in the agricultural lands.

The Proposed Action would result in the conversion of tree- and shrub-dominated vegetation types in the Project Area to grass/forb-dominated vegetation types following reclamation. Over the long term, shrubs and trees would become reestablished and increase in abundance within the majority of disturbed areas as a result of reclamation and natural recolonization. Due to timing of Project development and concurrent reclamation, the total acreage of vegetation disturbed would not occur all at one time. Upon completion of the Project, the reclamation portion of the Proposed Action would be completed for 7,656 acres (92 percent of the disturbed area). Approximately 734 acres of vegetation in the vicinity of the open pit would be removed and not reclaimed.

The removal of 3,426 acres of singleleaf piñon and Utah juniper trees would be a long-term impact, since it would take approximately 75 to 100 years for mature woodlands to become reestablished in the disturbance areas. Of the 3,426 acres of total disturbance in piñon-juniper vegetation, approximately 734 acres of piñon-juniper woodland would be permanently lost due to the development of the open pit.

Project-related development would also impact approximately 5,841 acres of shrub-dominated vegetation types. This loss would represent a long-term impact as it would take up to 15 to 20 years following reclamation for mature shrubs species to reestablish.

Reclamation and revegetation would minimize the aforementioned impacts to vegetation. A total of 7,656 acres (or 92 percent of the disturbed area) would eventually be revegetated. Only the 734 acres of the open pit would remain unvegetated. Revegetation activities would be conducted as outlined in Section 2.1.17. Reclamation seed mixtures and application rates, based on BLM requirements, are shown in Tables 2.1-9 and 2.1-10. These mixtures would provide forage and cover species similar to the pre-disturbance conditions, facilitating the post-mining land uses of livestock grazing, wild horses, and wildlife habitat. In addition, these seed mixes have been determined based on the species' ability to grow within the constraints of the low annual precipitation experienced in the region, its suitability for site aspect, and the elevation and soil

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

- **Impact 3.9.3.3-1:** Disturbance or removal of vegetation community types would occur as a direct result of the Proposed Action.

Significance of the Impact: The impact would be considered less than significant because the disturbance would not occur all at once and would include concurrent reclamation. Based on the conclusions from the analysis, no additional mitigation is proposed.

Phreatophytes that may be impacted as a result of the Proposed Action aquifer drawdown occur in the Kobeh Valley. In the central Kobeh Valley, the shallow ground water at the valley floor supports substantial areas of phreatophyte vegetation, with roots that tap ground water (Figure 3.9.2). ET of ground water by phreatophytes is the primary ground water discharge in the basin. Approximately 4,122 acres of phreatophyte vegetation occur within the ten-foot drawdown contour and would potentially be lost as an indirect result of the Proposed Action through a change in vegetation density, cover, or a change in vegetation community (Figure 3.9.2). The reduction or loss of phreatophytes could result in a positive or negative impact. Phreatophytes could be replaced with herbaceous species that meet the requirements of wildlife, wild horses, and livestock or by invasive non-native and/or noxious species which have diminished values for habitat, forage, and ecosystem functionality. Nonetheless, the phreatophytic community would be reduced or lost along with potential impacts to wildlife species that rely on the phreatophytic community. Impacts to other vegetation communities as a result of drawdown are not expected.

The ten-foot drawdown contour for the Proposed Action does not intercept any known phreatophyte vegetation within Diamond Valley, Antelope Valley, or Pine Valley.

- **Impact 3.9.3.3-2:** Phreatophyte vegetation 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 in the area of phreatophytes would potentially cause a decline in those communities.

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

- **Mitigation Measure 3.9.3.3-2:** The BLM would provide EML with 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 there is insufficient water to support phreatophytes or aquatic-dependent species, the BLM may provide a salt scrub, or other appropriate, seed mix. The BLM would provide this seed mix at the time the mitigation would be implemented.
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.9.3.3-2 would be effective at reducing the potential impacts from loss of vegetation; however, phreatophytic vegetation would be lost. Phreatophytic vegetation may re-establish once

the water table has recovered (at least 100 years post mining and milling). Reseeding with appropriate seed mixes would reduce long-term impacts associated with the loss of phreatophyte vegetation.

The Project mining activities and vehicular traffic would affect vegetation within the immediate vicinity of the Project Area by increasing the amount of airborne particulate deposition onto vegetation surfaces. Deposition could result in lowered primary production in plants due to reduced photosynthesis and decreased water-use efficiency. The potential effects on vegetation from dust would be reduced by wind and periodic precipitation, which would remove some of the accumulated dust. In addition, the implementation of the fugitive dust reduction measures outlined in the Proposed Action would reduce the impact of dust deposition on vegetation.

- **Impact 3.9.3.3-3:** Vegetation in the immediate vicinity of the Project Area could suffer periodic short-term reductions in primary production due to airborne particulate deposition onto exposed surfaces.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

The fenced area around the Project would limit BLM fire management activities by preventing normal access. The development of the Project well field in Kobeh Valley would create multiple unvegetated linear features (roads) that could be used as fire breaks in BLM fire management activities. These constructed roads could also provide additional access for potential fire management activities. Mine equipment and water resources could also be used to aid in suppression activities.

Potential impacts to the management of vegetation communities for wildland fire prevention and control as a result of Project activities would be limited as a result of the implementation of precautionary measures outlined in Sections 2.1.10 and 2.1.14.8.

- **Impact 3.9.3.3-4:** The Project would result in limitations and enhancements to the BLM's fire management activities within the vicinity of the Project Area.

Significance of the Impact: Based on the conclusions from the analysis, the impact is not significant. However, the following mitigation is proposed.

- **Mitigation Measure 3.9.3.3-4:** During periods of high fire danger, EML would utilize welding tents during welding activities along the pipeline or powerline routes in the Project Area.
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.9.3.3-4 would be very effective at reducing the potential for Project activities to result in wildland fires.

3.9.3.3.2 Special Status Plant Species

Based on habitat requirements or known distribution, three special status plant species were identified as potentially occurring in the Project Area. As discussed above, field surveys were conducted in the Project Area for Beatley buckwheat, windloving buckwheat, and least phacelia. No habitat was observed for least phacelia and no populations of least phacelia were observed in

the Project Area. Limited potentially suitable habitat was identified for Beatley buckwheat and windloving buckwheat; however, no populations of Beatley buckwheat or windloving buckwheat were observed in the Project Area.

- **Impact 3.9.3.3-5:** Disturbance or removal of potential habitat for Beatley buckwheat and windloving buckwheat could occur as a result of the Proposed Action.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

Habitat for Beatley buckwheat, windloving buckwheat, and least phacelia is located outside of the Project Area within the area that is predicted to be impacted by the aquifer drawdown. Potential habitat for Beatley buckwheat includes dry volcanic outcrops and potential habitat for windloving buckwheat includes claypan soils located on the valley floor and volcanic ridges. While there is potential habitat for these two species of buckwheat located within the area predicted to be impacted by the aquifer drawdown, these species are not wetland-dependent. Therefore, no indirect impacts to these species are anticipated as a result of the aquifer drawdown.

Potential habitat for least phacelia includes vernal saturated, summer-drying, sparsely vegetated, partially shaded to fully exposed areas of bare soil and mud banks in meadows. Potential habitat for this species is located within the area predicted to be impacted by the aquifer drawdown. However, additional habitat for this species is located outside of the area predicted to be indirectly impacted by the Proposed Action and as of 2001 this species had been located 39 times in the State of Nevada (<http://heritage.nv.gov/atlas/phaceminut.pdf>).

- **Impact 3.9.3.3-6:** Potential, unsurveyed habitat for least phacelia located outside of 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 in the potential habitat could potentially impact these species indirectly.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

Although there are no known occurrences of Monte Neva Indian paintbrush in the Project Area; the BLM has identified occupied habitat for this species between Lone Mountain and 3 Bars Road near Hot Springs Hill. The species is aquatic or wetland-dependent but lies outside of the area impacted by the predicted aquifer drawdown.

- **Impact 3.9.3.3-7:** Occupied and potential habitat for the Monte Neva Indian paintbrush is not expected to experience water stress because it is located outside of the predicted water table drawdown associated with ground water pumping and subsequent recovery of the water table. However, lowering of the water table in the occupied and potential habitat could potentially impact this species.

Significance of the Impact: No indirect impact from the Proposed Action is expected to this species or occupied habitat because they are located outside of the predicted water table drawdown. Yearly monitoring would be conducted for this species. If impacts to the

species from the Project are detected mitigation would be developed by the BLM and EML.

3.9.3.3.3 Residual Adverse Impacts

Residual adverse impacts to vegetation would include the permanent loss of vegetative productivity from approximately 734 acres of land associated with the open pit that would not be reclaimed and a long-term change in vegetation composition (i.e., tree and shrub dominated communities to grass and forb dominated communities, potential loss of phreatophyte vegetation) as a result of Project development and operation.

Residual adverse effects to special status species would not occur as a result of the Project since no special status species were located within the Project Area. There is a potential residual indirect effect to potential unoccupied special status plant species habitat.

3.9.3.4 No Action Alternative

Under the No Action Alternative, the proposed Project would not be developed and associated impacts to vegetation 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.

3.9.3.4.1 Vegetation Communities Disturbed by the No Action Alternative

Under the No Action Alternative, EML would continue to conduct mineral exploration and data acquisition within the Project Area. Ongoing reclamation would help to minimize impacts to vegetation through continuation of current and ongoing activities, with resulting short-term impacts to herbaceous species and long-term impacts to woody species.

- **Impact 3.9.3.4-1:** Implementation of the No Action Alternative would result in the general removal of vegetation.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

3.9.3.4.2 Special Status Plant Species

No additional disturbance beyond that previously authorized would occur in association with ongoing existing operations. As a result, there would be no additional impacts to potential habitat for special status plant species under this alternative.

3.9.3.4.3 Residual Adverse Impacts

The No Action Alternative would have unavoidable short-term impacts to herbaceous species and long-term impacts to wood vegetation species as part of surface disturbance associated with permitted exploration and data acquisition; however, revegetation and reclamation would minimize these impacts to vegetation.

3.9.3.5 Partial Backfill Alternative

3.9.3.5.1 Vegetation Communities Disturbed by the Partial Backfill Alternative

Impacts to vegetation community types 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 using growth media and then 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 vegetation would be similar to, but slightly less than, those described for the Proposed Action.

- **Impact 3.9.3.5-1:** Disturbance or removal of vegetation community types would occur as a result of the Partial Backfill Alternative.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

Impacts to phreatophyte vegetation would be similar to those under the Proposed Action.

- **Impact 3.9.3.5-2:** Phreatophyte vegetation 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 in the area of phreatophytes would potentially cause a decline in those communities.

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

- **Mitigation Measure 3.9.3.5-2:** The BLM would provide EML with 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 there is insufficient water to support phreatophytes or aquatic-dependent species, the BLM may provide a salt scrub, or other appropriate, seed mix. The BLM would provide this seed mix at the time the mitigation would be implemented.
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.9.3.5-2 would be effective at reducing the potential impacts from loss of vegetation; however, phreatophytic vegetation would be lost. Phreatophytic vegetation may re-establish once the water table has recovered (at least 100 years post mining and milling). Reseeding with appropriate seed mixes would reduce long-term impacts associated with the loss of phreatophyte vegetation.

The Project mining activities and vehicular traffic would affect vegetation within the immediate vicinity of the Project Area by increasing the amount of airborne particulate deposition onto vegetation surfaces. Deposition could result in lowered primary production in plants due to reduced photosynthesis and decreased water use efficiency. The potential effects on vegetation from dust would be reduced by wind and periodic precipitation, which would remove some of the accumulated dust. In addition, the implementation of the fugitive dust reduction measures outlined in the Proposed Action would reduce the impact of dust deposition on vegetation.

- **Impact 3.9.3.5-3:** Vegetation in the immediate vicinity of the Project Area could suffer periodic short-term reductions in primary production due to airborne particulate deposition onto exposed surfaces.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

The fenced area around the Project would limit BLM fire management activities by preventing normal access. The development of the Project well field in Kobeh Valley would create multiple unvegetated linear features (roads) that could be used as fire breaks in BLM fire management activities. These constructed roads could also provide additional access for potential fire management activities. Mine equipment and water resources could also be used to aid in suppression activities.

Potential impacts to the management of vegetation communities for wildland fire prevention and control as a result of Project activities would be limited as a result of the implementation of precautionary measures outlined in Sections 2.1.10 and 2.1.14.8.

- **Impact 3.9.3.5-4:** The Project would result in limitations and enhancements to the BLM's fire management activities within the vicinity of the Project Area.

Significance of the Impact: Based on the conclusions from the analysis, the impact is not significant. However, the following mitigation measure is proposed.

- **Mitigation Measure 3.9.3.5-4:** During periods of high fire danger, EML would utilize welding tents during welding activities along the pipeline or powerline routes in the Project Area.

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.9.3.5-4 would be very effective at reducing the potential for Project activities to result in wildland fires.

3.9.3.5.2 Special Status Plant Species

Impacts to special status plant species and their habitat as a result of the Partial Backfill Alternative would be similar to those for the Proposed Action.

- **Impact 3.9.3.5-5:** Disturbance or removal of potential habitat for Beatley buckwheat and windloving buckwheat could occur as a result of the Proposed Action.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.9.3.5-6:** Potential, unsurveyed habitat for least phacelia located outside of 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 in the potential habitat could potentially impact these species indirectly.

Significance of the Impact: The indirect impact of the Proposed Action to potential habitat of these species would not meet the significance criteria listed in Section 3.9.3.1. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.9.3.5-7:** Occupied and potential habitat for the Monte Neva Indian paintbrush is not expected to experience water stress because it is located outside of the predicted water table drawdown associated with ground water pumping and subsequent recovery of the water table. However, lowering of the water table in the occupied and potential habitat could potentially impact this species.

Significance of the Impact: No indirect impact from the Proposed Action is expected to this species or occupied habitat because they are located outside of the predicted water table drawdown. Yearly monitoring would be conducted for this species. If impacts to the species from the Project are detected, mitigation would be developed by the BLM and EML.

3.9.3.5.3 Residual Adverse Impacts

Residual adverse effects to vegetation would include the permanent loss of vegetative productivity from approximately 527 acres of land associated with the open pit that would not be reclaimed and a long-term change in vegetation composition (i.e., tree and shrub dominated communities to grass and forb dominated communities, potential loss of phreatophyte vegetation) as a result of Project development and operation.

Residual adverse effects to special status species would not occur as a result of the Project since no special status species were located within the Project Area.

3.9.3.6 Off-Site Transfer of Ore Concentrate for Processing Alternative

3.9.3.6.1 Vegetation Communities Disturbed by the 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 in the piñon-juniper/big sagebrush vegetation community when compared to the Proposed Action, impacts to vegetation community types from this alternative would be similar to those for the Proposed Action since the disturbance acreage would decrease by only 0.2 percent.

- **Impact 3.9.3.6-1:** Implementation of the Off-Site Transfer of Ore Concentrate for Processing Alternative would result in the general removal of vegetation.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

Impacts to phreatophyte vegetation would be similar to those under the Proposed Action.

- **Impact 3.9.3.6-2:** Phreatophyte vegetation could potentially experience water stress due to the water table drawdown associated with ground water pumping and subsequent

recovery of the water table after pumping. Lowering of the water table in the area of phreatophytes could potentially cause a decline in those communities.

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

- **Mitigation Measure 3.9.3.6-2:** The BLM would provide EML with 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 there is insufficient water to support phreatophytes or aquatic-dependent species, the BLM may provide a salt scrub, or other appropriate, seed mix. The BLM would provide this seed mix at the time the mitigation would be implemented.
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.9.3.6-2 would be effective at reducing the potential impacts from loss of vegetation; however, phreatophytic vegetation would be lost. Phreatophytic vegetation may re-establish once the water table has recovered (at least 100 years post mining and milling). Reseeding with appropriate seed mixes would reduce long-term impacts associated with the loss of phreatophyte vegetation.

The Project mining activities and vehicular traffic would affect vegetation within the immediate vicinity of the Project Area by increasing the amount of airborne particulate deposition onto vegetation surfaces. Deposition could result in lowered primary production in plants due to reduced photosynthesis and decreased water use efficiency. The potential effects on vegetation from dust would be reduced by wind and periodic precipitation, which would remove some of the accumulated dust. In addition, the implementation of the fugitive dust reduction measures outlined in the Proposed Action would reduce the impact of dust deposition on vegetation.

- **Impact 3.9.3.6-3:** Vegetation in the immediate vicinity of the Project Area could suffer periodic short-term reductions in primary production due to airborne particulate deposition onto exposed surfaces.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

The fenced area around the Project would limit BLM fire management activities by preventing normal access. The development of the Project well field in Kobeh Valley would create multiple unvegetated linear features (roads) that could be used as fire breaks in BLM fire management activities. These constructed roads could also provide additional access for potential fire management activities. Mine equipment and water resources could also be used to aid in suppression activities.

Potential impacts to the management of vegetation communities for wildland fire prevention and control as a result of Project activities would be limited as a result of the implementation of precautionary measures outlined in Sections 2.1.10 and 2.1.14.8.

- **Impact 3.9.3.6-4:** The Project would result in limitations and enhancements to the BLM's fire management activities within the vicinity of the Project Area.

Significance of the Impact: Based on the conclusions from the analysis, the impact is not significant. However, the following mitigation measure is proposed.

- **Mitigation Measure 3.9.3.6-4:** During periods of high fire danger, EML would utilize welding tents during welding activities along the pipeline or powerline routes in the Project Area.
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.9.3.6-4 would be very effective at reducing the potential for Project activities to result in wildland fires.

3.9.3.6.2 Special Status Plant Species

Impacts to special status plant species and their habitat as a result of the Off-Site Transfer of Ore Concentrate for Processing Alternative would be similar to those for the Proposed Action.

- **Impact 3.9.3.6-5:** Disturbance or removal of potential habitat for Beatley buckwheat and windloving buckwheat could occur as a result of the Off-Site Transfer of Ore Concentrate for Processing Alternative.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.9.3.6-6:** Potential, unsurveyed habitat for least phacelia located outside of 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 in the potential habitat could potentially impact these species indirectly.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.9.3.6-7:** Occupied and potential habitat for the Monte Neva Indian paintbrush is not expected to experience water stress because it is located outside of the predicted water table drawdown associated with ground water pumping and subsequent recovery of the water table. However, lowering of the water table in the occupied and potential habitat could potentially impact this species.

Significance of the Impact: No indirect impact from the Off-Site Transfer of Ore Concentrate for Processing Alternative is expected to this species or occupied habitat because they are located outside of the predicted water table drawdown. Yearly monitoring would be conducted for this species. If impacts to the species from the Project are detected mitigation would be developed by the BLM and EML.

3.9.3.6.3 Residual Adverse Impacts

The potential residual impacts to vegetation resources from the Off-Site Transfer of Ore Concentrate for Processing Alternative would be similar to those for the Proposed Action.

3.9.3.7 Slower, Longer Project Alternative

Impacts from the Slower, Longer Project Alternative would occur over a period approximately twice as long in duration compared to the Proposed Action. As discussed in Section 3.2.3, the surface area predicted to be impacted by the drawdown by this alternative is similar to, but slightly different than, the Proposed Action. The differences between the predicted drawdown area is illustrated on Figure 3.2.3. Impacts to vegetation as a result of the Slower, Longer Project Alternative are expected to be similar to the Proposed Action at the end of the Project.

3.9.3.7.1 Vegetation Communities Disturbed by the Slower, Longer Project Alternative

Vegetation communities impacted by the Slower, Longer Project Alternative would be the same as the Proposed Action.

- **Impact 3.9.3.7-1:** Disturbance or removal of vegetation community types would occur as a result of the Slower, Longer Project Alternative.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.9.3.7-2:** Phreatophyte vegetation would potentially experience water stress due to the water table drawdown associated with ground water pumping and subsequent recovery of the water table after pumping. Lowering of the water table in the area of phreatophytes would potentially cause a decline in those communities.

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

- **Mitigation Measure 3.9.3.7-2:** The BLM would provide EML with 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 there is insufficient water to support phreatophytes or aquatic-dependent species, the BLM may provide a salt scrub, or other appropriate, seed mix. The BLM would provide this seed mix at the time the mitigation would be implemented.

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.9.3.7-2 would be effective at reducing the potential impacts from loss of vegetation; however, phreatophytic vegetation would be lost. Phreatophytic vegetation may re-establish once the water table has recovered (at least 100 years post mining and milling). Reseeding with appropriate seed mixes would reduce long-term impacts associated with the loss of phreatophyte vegetation.

- **Impact 3.9.3.7-3:** Vegetation in the immediate vicinity of the Project Area could suffer periodic short-term reductions in primary production due to airborne particulate deposition onto exposed surfaces.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

The fenced area around the Project would limit BLM fire management activities by preventing normal access. The development of the Project well field in Kobeh Valley would create multiple unvegetated linear features (roads) that could be used as fire breaks in BLM fire management activities. These constructed roads could also provide additional access for potential fire management activities. Mine equipment and water resources could also be used to aid in suppression activities.

Potential impacts to the management of vegetation communities for wildland fire prevention and control as a result of Project activities would be limited as a result of the implementation of precautionary measures outlined in Sections 2.1.10 and 2.1.14.8.

- **Impact 3.9.3.7-4:** The Project would result in limitations and enhancements to the BLM's fire management activities within the vicinity of the Project Area.

Significance of the Impact: Based on the conclusions from the analysis, the impact is not significant. However, the following mitigation measure is proposed.

- **Mitigation Measure 3.9.3.7-4:** During periods of high fire danger, EML would utilize welding tents during welding activities along the pipeline or powerline routes in the Project Area.
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.9.3.7-4 would be very effective at reducing the potential for Project activities to result in wildland fires.

3.9.3.7.2 Special Status Plant Species

Impacts to special status plant species from the Slower, Longer Project Alternative would be the same as the Proposed Action.

- **Impact 3.9.3.7-5:** Disturbance or removal of potential habitat for Beatley buckwheat and windloving buckwheat could occur as a result of the Slower, Longer Project Alternative.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.9.3.7-6:** Potential, unsurveyed habitat for least phacelia located outside of 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 in the potential habitat could potentially impact these species indirectly.

Significance of the Impact: The indirect impact of the Proposed Action to potential habitat of these species would not meet the significance criteria listed in Section 3.9.3.1. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.9.3.7-7:** Occupied and potential habitat for the Monte Neva Indian paintbrush is not expected to experience water stress because it is located outside of the predicted water table drawdown associated with ground water pumping and subsequent recovery of

the water table. However, lowering of the water table in the occupied and potential habitat could potentially impact this species.

Significance of the Impact: No indirect impact of the Proposed Action is expected to this species or occupied habitat because they are located outside of the predicted water table drawdown. Yearly monitoring would be conducted for this species. If impacts to the species from the Project are detected, mitigation would be developed by the BLM and EML.

3.9.3.7.3 Residual Adverse Impacts

Residual adverse impacts to vegetation would include the permanent loss of vegetative productivity from approximately 734 acres of land associated with the open pit that would not be reclaimed and a long-term change in vegetation composition (i.e., tree and shrub dominated communities to grass and forb dominated communities, potential loss of phreatophyte vegetation) as a result of Project development and operation.

Residual adverse effects to special status species would not occur as a result of the Project since no special status species were located within the Project Area.

3.10 Noxious Weeds, Invasive & Nonnative Species

3.10.1 Regulatory Framework

Noxious weeds are designated by state, federal, or other laws and regulations and are mandated to be prevented or controlled because of their potential to cause economic harm (e.g., affect the quality of forage on rangelands, affect cropland, or forest land productivity), environmental harm (e.g., displace native plants and natural habitats), or harm human and animal health. There are no State of Nevada listed noxious weeds found within the boundary of the Project Area. This analysis will focus on invasive plant and nonnative species. Invasive and/or nonnative plant species are generally plants that have become too extensive and widely distributed to be effectively controlled or eradicated.

3.10.1.1 Executive Order 11312: Prevention and Control of Invasive Species

Several federal laws provide direction for addressing the prevention and control of noxious weeds, invasive and nonnative species. For example, the Plant Protection Act authorizes the USDA to list weeds that have been determined to cause certain harm, including damage to agricultural or natural resources, as being "noxious weeds." EO 11312 established a national Invasive Species Council, made up of federal agencies and departments, and a supporting Invasive Species Advisory Council, composed of state, local, and private entities. The Invasive Species Council and Advisory Committee oversees and facilitates implementation of the EO, including preparation of a National Invasive Species Management Plan.

3.10.1.2 Federal Noxious and Invasive Weed Laws

A number of federal laws pertain to noxious and invasive weeds, including the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, as amended (16 U.S.C. 4701 et seq.), Lacey Act, as amended (18 U.S.C. 42), Federal Plant Pest Act (7 U.S.C. 150aa et seq.), Federal

Noxious Weed Act of 1974, as amended by the Food, Agriculture, Conservation, and Trade Act of 1990 (Section 1453 “Management of Undesirable Plants on Federal Lands” U.S.C. 2801 et seq.), the Carlson-Foley Act of 1968 (Public Law 90-583), and Federal EO 11312 released February 3, 1999. In Nevada, the BLM is primarily concerned with the control of State of Nevada listed noxious weed infestations and their dispersal on public lands. The BLM, USDA and the Nevada Department of Agriculture (NDOA) maintain lists of noxious weeds of economic or ecological concern.

3.10.1.3 Nevada Noxious Weed Laws

Chapter 555 of the Nevada Revised Statute (NRS) pertains to noxious weeds. The NDOA has responsibility for jurisdiction, management, and enforcement of the state’s noxious weed law. Plants on Nevada’s noxious weeds list are mandated to be controlled on both private and public land. The NDOA also maintains and updates a list of state listed noxious weeds, which can be found at the following web link, (http://agri.nv.gov/nwac/PLANT_NoxWeedList.htm). Chapter 555 also calls for the establishment of county “Weed Control Districts” with the responsibility to control and eradicate noxious weeds. The legislature declared that it is the responsibility of each owner or occupier of land in Nevada to control noxious weeds on their land, but finds that in certain areas this responsibility can best be discharged through control by organized Weed Districts. Eureka County has a Weed District (Diamond Valley) in place, which coordinates noxious weed control efforts on both public and private land.

3.10.2 **Affected Environment**

3.10.2.1 Study Methods

Noxious weed, invasive and nonnative weed surveys were conducted by SRK in a majority of the Project Area between June 2005 through August 2006. The noxious weed, invasive and nonnative species surveys were conducted concurrently with the vegetation and wildlife biological baseline surveys (SRK 2007b, 2007c). The Kobeh Valley portion of the Project Area was surveyed for noxious weeds, invasive and nonnative species by Great Basin Ecology in July 2008 (Great Basin Ecology 2008).

3.10.2.2 Existing Conditions

No infestations of NDOA listed noxious weeds were observed in the Project Area. Cheatgrass (an invasive nonnative annual grass species) was observed as an understory component of most of the vegetation types; however, no large cheatgrass monocultures were observed (SRK 2007b). Other invasive nonnative plants species observed within the Project Area were halogeton and Russian thistle (*Salsola kali*). These two species are not considered noxious weeds by the State of Nevada and, therefore, not listed on the NDOA's noxious weed list.

3.10.3 Environmental Consequences and Mitigation Measures

3.10.3.1 Significance Criteria

Based upon BLM Manual 9015 guidelines, the Proposed Action or alternatives would be considered to have a significant effect on noxious weed management if it resulted in the following:

- An increased likelihood of the introduction of noxious weed species or invasive, nonnative species, into a relatively weed-free area at moderate or high ecological risk as a result of a lack of preventative action; or
- An expansion of noxious weed infestation(s) within and outside of the Project Area into relatively weed-free areas at moderate or high ecological risk.

Ecological risk is the level of likelihood and consequence of adverse effects on the environment. A determination of a Risk Rating (none, low, moderate, or high) is made through the Risk Assessment process outlined in Appendix 1 of BLM Manual 9015. Areas with a moderate or high risk rating have the following: a) noxious weed infestations immediately adjacent to or within the Project Area; b) activities associated with the Project that are likely to result in some areas becoming infested; and c) there are probable adverse effects on native plant communities within, and possibly outside of, the Project Area.

3.10.3.2 Assessment Methodology

The assessment of the effects of the Project on noxious weed management is based on a qualitative analysis of the potential for noxious weeds, invasive and nonnative species to become introduced or established within the Project Area as a result of increased activity disturbance and reclamation. The effects of the Project are determined to be significant or not significant based on the applicable significance criteria listed in Section 3.10.3.1.

3.10.3.3 Proposed Action

Although no noxious weeds were observed in the Project Area, weedy annual species including cheatgrass and halogeton were identified within the Project Area, and Russian thistle was located near the Project Area. Although Scotch thistle (*Onopordum acanthium*), hoary cress (*Cardaria draba*), and salt cedar (*Tamarix ramosissima*) have been mapped and treated by Eureka County in the vicinity, these species were not observed during surveys of the Project Area. Invasive, nonnative plant species readily invade areas that have been disturbed and which typically lack or have minimal vegetation cover. Development and operation of the Project would remove or disturb 8,318 acres of vegetation over the 44-year mine life, of which 734 acres associated with the open pit would not be reclaimed.

The operational performance standards outlined in Section 2.1.14.7 would substantially reduce the introduction and spread of noxious weeds, invasive and nonnative species. The operational performance standards include the implementation of a noxious weed monitoring and control plan during construction and throughout operations. Implementation of this plan would be coordinated with the BLM.

Reclamation would also reduce the establishment of noxious weeds in the Project Area. Due to concurrent reclamation, the total acreage of vegetation disturbed would not occur all at one time; however, minor populations of weedy annual species (e.g., halogeton and cheatgrass) may become established in localized areas for short periods of time. Growth media stockpiles would be reclaimed with an interim seed mix to stabilize the growth media, reduce soil erosion, and minimize the potential for the establishment of noxious weeds. Successful reclamation of mine related surface disturbance areas would result in the establishment of a permanent vegetative cover, which would minimize the potential establishment of noxious weeds in the long term. Although the open pit would not be reclaimed, noxious weeds would not likely become established in the open pit due to the absence of soil and the formation of a pit lake in the long term. As described in Section 2.1.14, EML would utilize certified weed-free seed mixes for reclamation. Weed control practices would be implemented in coordination with the BLM to limit the spread of noxious weeds, if they appear in the Project Area.

- **Impact 3.10.3.3-1:** Implementation of the Proposed Action could result in the introduction and spread of noxious weeds, invasive and nonnative species.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.10.3.3-2:** Phreatophyte vegetation, riparian corridors, and wet meadows 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 in these areas would potentially result in the invasion of noxious weeds and/or invasive and nonnative species.

Significance of the Impact: The impact is considered potentially significant and mitigation is discussed below.

- **Mitigation Measure 3.10.3.3-2:** The BLM would provide EML with appropriate seed mixes for those areas within and outside the Project Area impacted by water table drawdown that should be seeded to prevent the invasion of noxious weeds, invasive and nonnative species. The nature of the seed mix may vary depending on the conditions encountered as a result of the drawdown. If there is insufficient water to support phreatophytes or aquatic-dependent species, the BLM may provide a salt scrub, or other appropriate, seed mix. The BLM would provide this seed mix at the time the mitigation would be implemented.
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.10.3.3-2 would ensure no long-term impacts from noxious weeds, invasive and nonnative species through appropriately reseeding areas that no longer support phreatophytes.

3.10.3.3.1 Residual Adverse Impacts

The Proposed Action would result in the unavoidable disturbance of approximately 8,318 acres of vegetation over the 44-year mine life, which would produce conditions conducive to supporting noxious weeds. Implementation of reclamation and the noxious weed monitoring and control plan would reduce or eliminate the chance of noxious weed establishment and infestation.

3.10.3.4 No Action Alternative

Under the No Action Alternative, the proposed Project would not be developed and associated impacts to noxious weed management would not occur. EML would continue existing activities under previously permitted Notices for a total of 30 acres of surface disturbance and the area would remain available for future mineral development or for other purposes as approved by the BLM.

3.10.3.4.1 Residual Adverse Impacts

There are no residual adverse impacts from noxious weeds associated with the No Action Alternative.

3.10.3.5 Partial Backfill Alternative

Impacts from noxious weeds 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 would be reclaimed with growth media and seeded. The operational performance standards outlined in Section 2.1.15 and reclamation would reduce the potential for noxious weeds to establish in the Project Area. 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 from noxious weeds would be similar to, but slightly less than, those described for the Proposed Action.

- **Impact 3.10.3.5-1:** Implementation of the Partial Backfill Alternative could result in the introduction and spread of noxious weeds, invasive and nonnative plant species.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.10.3.5-2:** Phreatophyte vegetation, riparian corridors, and wet meadows 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 in these areas would potentially result in the invasion of noxious weeds, invasive and nonnative species.

Significance of the Impact: The impact is considered potentially significant and mitigation is discussed below.

- **Mitigation Measure 3.10.3.5-2:** The BLM would provide EML with appropriate seed mixes for those areas within and outside the Project Area impacted by water table drawdown that should be seeded to prevent the invasion of noxious weeds, invasive and nonnative species. The nature of the seed mix may vary depending on the conditions encountered as a result of the drawdown. If there is insufficient water to support phreatophytes or aquatic-dependent species, the BLM may provide a salt scrub, or other appropriate, seed mix. The BLM would provide this seed mix at the time the mitigation would be implemented.

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.10.3.5-2 would ensure no long-term impacts from noxious weeds, invasive and nonnative species through appropriately reseeding areas that no longer support phreatophytes.

3.10.3.5.1 Residual Adverse Impacts

The Partial Backfill Alternative would result in the unavoidable disturbance of approximately 8,318 acres of vegetation over the 44-year life of the mine, which would produce conditions conducive to supporting noxious weeds. Implementation of reclamation and the noxious weed monitoring and control plan would reduce or eliminate the chance of noxious weed establishment and infestation.

3.10.3.6 Off-Site Transfer of Ore Concentrate for Processing Alternative

Impacts from noxious weeds would be similar to those described for the Proposed Action; however, the Off-Site Transfer of Ore Concentrate for Processing Alternative would result in approximately 20 acres less surface disturbance. The operational performance standards outlined in Section 2.1.14.7 and reclamation would reduce the potential for noxious weeds to establish in the Project Area. When compared to the Proposed Action, impacts from noxious weeds as a result of this alternative would be similar to those for the Proposed Action since the acreage of surface disturbance would decrease by only 0.2 percent.

- **Impact 3.10.3.6-1:** Implementation of the Off-Site Transfer of Ore Concentrate for Processing Alternative could result in the introduction and spread of noxious weeds, invasive and nonnative plant species.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.10.3.6-2:** Phreatophyte vegetation, riparian corridors, and wet meadows 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 in these areas would potentially result in the invasion of noxious weeds, invasive and nonnative species.

Significance of the Impact: The impact is considered potentially significant and mitigation is described below.

- **Mitigation Measure 3.10.3.6-2:** The BLM would provide EML with appropriate seed mixes for those areas within and outside the Project Area impacted by water table drawdown that should be seeded to prevent the invasion of noxious weeds and/or invasive and nonnative species. The nature of the seed mix may vary depending on the conditions encountered as a result of the drawdown. If there is insufficient water to support phreatophytes or aquatic-dependent species, the BLM may provide a salt scrub, or other appropriate, seed mix. The BLM would provide this seed mix at the time the mitigation would be implemented.

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.10.3.6-2 would ensure no long-term impacts from noxious weeds, invasive nonnative species through appropriately reseeding areas that no longer support phreatophytes.

3.10.3.6.1 Residual Adverse Impacts

The Off-Site Transfer of Ore Concentrate for Processing Alternative would result in the unavoidable disturbance of approximately 8,298 acres of vegetation over the 44-year mine life of which 734 acres associated with the open pit would not be reclaimed, which would produce conditions conducive to supporting noxious weeds. Reclamation and the noxious weed monitoring and control plan would reduce or eliminate the chance of noxious weed establishment and infestation.

3.10.3.7 Slower, Longer Project Alternative

Impacts from noxious weeds would be similar to those described for the Proposed Action; however, the Slower, Longer Project Alternative would occur over a period approximately twice as long in duration compared to the Proposed Action and the surface area predicted to be impacted by the drawdown by this alternative is slightly different than the Proposed Action. The differences between the predicted drawdown area is illustrated on Figure 3.2.28. The operational performance standards outlined in Section 2.1.15 and reclamation would reduce the potential for noxious weeds to establish in the Project Area. Impacts from noxious weeds and invasive, nonnative species as a result of the Slower, Longer Project Alternative are expected to be similar to the Proposed Action at the end of the Project.

- **Impact 3.10.3.7-1:** Implementation of the Slower, Longer Project Alternative could result in the introduction and spread of noxious weeds, invasive and nonnative plant species.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.10.3.7-2:** Phreatophyte vegetation, riparian corridors, and wet meadows 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 in these areas would potentially result in the invasion of noxious weeds, invasive and nonnative species.

Significance of the Impact: The impact is considered potentially significant and mitigation is described below.

- **Mitigation Measure 3.10.3.7-2:** The BLM would provide EML with appropriate seed mixes for those areas within and outside the Project Area impacted by water table drawdown that should be seeded to prevent the invasion of noxious weeds, invasive and nonnative species. The nature of the seed mix may vary depending on the conditions encountered as a result of the drawdown. If there is insufficient water to support phreatophytes or aquatic-dependent species, the BLM may provide a salt scrub, or other appropriate, seed mix. The BLM would provide this seed mix at the time the mitigation would be implemented.

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.10.3.7-2 would ensure no long-term impacts from noxious weeds, invasive nonnative species through appropriately reseeding areas that no longer support phreatophytes.

3.10.3.7.1 Residual Adverse Impacts

The Slower, Longer Project Alternative would result in the unavoidable disturbance of approximately 8,318 acres of vegetation over the extended mine life, which would produce conditions conducive to supporting noxious weeds. Implementation of reclamation and the noxious weed monitoring and control plan would reduce or eliminate the chance of noxious weed establishment and infestation.

3.11 Wetlands and Riparian Zones

3.11.1 Regulatory Framework

This section discusses the regulatory definition of wetlands, as well as the laws and regulations that may apply to wetland and riparian resources potentially affected by the Project. Wetland communities are considered valuable natural resources that provide habitat for a variety of dependent plant and wildlife species. Riparian/wetland areas also provide ecosystem services and values that are critical within BLM's multiple use mandate. The USACE and the EPA have policies and laws that regulate federally jurisdictional wetlands. However, there are no federally jurisdictional wetlands within the Project Area. As a result, federal management of wetlands is through the BLM on public lands and through State of Nevada Water Law relative to the use of water from wetlands. State of Nevada Water Law is discussed in Section 3.2.

3.11.1.1 Definition of Wetlands

Wetlands are defined by the USACE and EPA in 40 CFR 230.3 and 33 CFR 328.3 as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal conditions, do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

The BLM defines riparian as: “A riparian area is an area of land directly influenced by permanent water. It has visible vegetation or physical characteristics reflective of permanent water influence. Lake shores and stream banks are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil.”

In 1991 the BLM Director approved the *Riparian-Wetland Initiative for the 1990's*, which establishes national goals and objectives for managing riparian-wetland resources on public lands. One of the chief goals of this initiative is to restore and maintain riparian-wetland areas so that 75 percent or more are in proper functioning condition (PFC) by 1997 (BLM 1991). The overall objective of this goal is to achieve an advanced ecological status, except where resource management objectives, including PFC, would require an earlier successional stage, thus providing the widest variety of vegetation and habitat diversity for wildlife, fish, and watershed protection. This objective is important to remember because riparian-wetland areas would function properly long before they achieve an advanced ecological status. The *Riparian-Wetland*

Initiative for the 1990's also includes a strategy to focus management on the entire watershed. Entire watershed condition is an important component in assessing whether a riparian-wetland area is functioning properly.

The USACE's Wetland Delineation Manual (USACE 1987) defines a three parameter approach to delineating jurisdictional wetlands. In order for an area to be considered a jurisdictional wetland it must support each of the three parameters: hydric soils; wetland vegetation; and wetland hydrology.

3.11.1.2 Executive Order 11990: Protection of Wetlands

The federal government supports a policy of minimizing "the destruction, loss, or degradation of wetlands" (EO 11990, May 24, 1977). The EO directs all federal agencies to refrain from assisting or giving financial support to projects that encroach on public or privately owned wetlands.

3.11.1.3 Federal Land Policy and Management Act

The FLPMA directs the BLM to manage public lands in a manner that would provide for multiple use and at the same time protect natural resources for generations to come. In addition to FLPMA, numerous laws, regulations, policies, EOs, and Memoranda of Understanding (MOUs) direct the BLM to manage its riparian/wetland areas for the benefit of the nation and the economy. BLM Manual 1737 for Riparian Wetland Area Management identifies marshes, shallow swamps, lakeshores, bogs, muskegs, wet meadows, estuaries, and riparian areas as wetlands.

3.11.2 Affected Environment

3.11.2.1 Study Methods

On September 21, 2005, SRK conducted a Routine On-Site Wetland Delineation (SRK 2007e) to determine the presence or absence of jurisdictional and non-jurisdictional wetlands within the Project Area in accordance with the following: Section 404 of the CWA; the USACE Wetland Delineation Manual (USACE 1987); and the Sacramento District, Reno, Nevada, field office Minimum Standards for Acceptance of Preliminary Wetland Delineations (October 11, 1994), revised November 30, 2001. If present, the extent of the wetland was determined. Potential wetlands within the Project Area are supported by spring or seep flow, and ephemeral surface flows. On July 15 through 17, 2011, JBR Environmental Consultants, Inc. (JBR) conducted a supplemental spring and riparian area investigation (JBR 2011).

Prior to the Routine On-Site Wetland Delineation, aerial photographs and topographic map tools were reviewed for indications of open water, springs, and ephemeral, intermittent, and perennial drainages. The Soil Survey of Eureka and Part of White Pine Counties, prepared by the NRCS was reviewed prior to visiting the site (NRCS 1998).

3.11.2.2 Existing Conditions

In the Routine On-Site Wetland Delineation it was determined that no waters of the U.S. are located in the Project Area. With no jurisdictional waters present in the Project Area, USACE

jurisdiction does not extend to the wetlands in the Project Area. A number of non-jurisdictional wetlands, or riparian areas, were identified in and surrounding the Project Area. Wetlands identified in the Project Area were recognized by the presence of facultative wet/obligate wetland plant species, ordinary high water mark (OHWM) indicators, and hydric soil indicators. The delineation identified 1,400 square feet (0.03 acre) of wetlands associated with Garden Spring (597) outside of the Project Area. During the July 2011 spring and seep survey, 0.22 acre of riparian vegetation was located within the Project Area associated with the Zinc adit (839) (JBR 2011). The springs and associated riparian vegetation identified in the Project Area and vicinity are shown on Figure 3.9.1.

3.11.3 Environmental Consequences and Mitigation Measures

3.11.3.1 Significance Criteria

Impacts to wetlands and riparian zones would be considered significant if the Proposed Action or alternatives resulted in any of the following:

- Violations of EO 11990 - Protection of Wetlands;
- Effects that are inconsistent with the objectives set forth in the BLM Riparian Initiative; or
- Eliminate, reduce, or adversely affect wetlands, riparian, or phreatophytic vegetation areas within the area directly or indirectly affected by Project activities.

3.11.3.2 Assessment Methodology

Potential effects on wetlands and riparian zones can be categorized as direct and indirect, as well as short term (i.e., during the life of the Project) and long term. Direct effects on wetlands and riparian zones could include removal or disturbance of riparian and wetland communities. Indirect effects could result from water table drawdown as a result of mine dewatering systems and well field pumping for process water. Short-term impacts are those that could occur during Project implementation and until reclamation is complete. Long-term impacts are those occurring after reclamation is complete. The effects are determined to be significant or not significant based on the applicable significance criteria listed in Section 3.11.3.1.

3.11.3.3 Proposed Action

Riparian and wetland communities that provide important habitat for local and migratory wildlife and fish species are considered sensitive resources, providing ecosystem services such as nutrient cycling, and also providing values such as irrigation and fisheries and are of concern to federal and state agencies. Riparian systems also provide water and habitat to wild horses and water to livestock. There are no jurisdictional wetlands or any other wetlands within the proposed areas of disturbance. Impacts to springs and stream water flows are discussed in Section 3.2.

- **Impact 3.11.3.3-1:** The Project would not result in the removal or disturbance of wetlands in the Project Area.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

The mine dewatering system and pumping of the production well field is expected to drawdown the ground water table in an area surrounding the open pit. As discussed in Section 3.2, modeling results show that significant water table drawdowns 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.

Phreatophytes that may be impacted as a result of the Proposed Action aquifer drawdown occur in the Kobeh Valley. In the central Kobeh Valley, the shallow ground water at the valley floor supports substantial areas of phreatophyte vegetation, with roots that tap ground water (Figure 3.9.2). ET of ground water by phreatophytes is the primary ground water discharge in the basin. Approximately 4,122 acres of phreatophyte vegetation occur within the ten-foot drawdown contour and would potentially be lost as a result of the Proposed Action.

The ten-foot drawdown contour for the Proposed Action does not intercept any mapped phreatophyte vegetation within Diamond Valley or Antelope Valley.

- **Impact 3.11.3.3-2:** Phreatophyte vegetation 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 in the area of phreatophytes would potentially cause a change in those communities to more xeric species with fewer ecological attributes of stability and altered succession.

Significance of the Impact: The impact is considered potentially significant and mitigation is discussed below.

- **Mitigation Measure 3.11.3.3-2:** The BLM would provide EML with 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 there is insufficient water to support phreatophytes or aquatic-dependent species, the BLM may provide a salt scrub, or other appropriate, seed mix. The BLM would provide this seed mix at the time the mitigation would be implemented.
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.11.3.3-2 would reduce potential impacts to phreatophyte vegetation from water stress due to the water table drawdown during Project activities. Reseeding with appropriate seed mixes would reduce long-term impacts associated with the loss of phreatophyte vegetation.

Water table drawdown would have a negative effect on wetland vegetation species dependent on seeps or springs. Lowering of the water table in the area where these plants occur would potentially cause a decline in the wetland community and the structure, functionality, and values offered by these systems. As the water table is lowered, the soils may dry out and these plants may decline due to water stress. Wetland plants that die as a result of water stress would likely be replaced by vegetation species that are not dependent on spring or seep water.

Twenty-two existing springs and 7.7 miles of perennial streams in the Roberts Creek and Henderson Creek drainage occur within the ten-foot drawdown contour (Figure 3.9.2). Table 3.2-6 in the Water Resources - Water Quantity Section identifies those springs that may be affected as a result of the Proposed Action. The total area of riparian vegetation that may be

indirectly affected by the decline in the water table is approximately four acres associated with springs and an undetermined number of acres associated with the 7.7 miles of perennial streams.

- **Impact 3.11.3.3-3:** Vegetation dependent on springs, seeps, and perennial streams (i.e., riparian vegetation) 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 in the area where these plants are located would potentially cause a decline in the riparian vegetation community.

Significance of the Impact: Potential impacts to riparian vegetation areas within the area directly or indirectly affected by Project activities would be monitored as outlined in Section 2.1.15 and in the Plan. The impact is considered potentially significant.

- **Mitigation Measure 3.11.3.3-3:** As stated in Mitigation Measure 3.2.3.3-2a specific mitigation for the two perennial stream segments and 22 perennial or potentially perennial spring sites are outlined in Table 3.2-9. Implementation of the mitigation outlined in this table would result in up to 46.3 acres of additional surface disturbance associated with the pipeline construction and maintenance. This supplemental water should sustain riparian vegetation. All riparian vegetation disturbed by the Project would be replaced on site at a three to one ratio with local cuttings, plugs, or seeds.
- **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 to very 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 3.11.3.3-3 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.

3.11.3.3.1 Residual Adverse Impacts

Following Project completion and reclamation, residual adverse impacts to riparian zones from the Proposed Action 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.

3.11.3.4 No Action Alternative

Under the No Action Alternative, the proposed Project would not be developed and associated impacts to wetlands and riparian zones 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.

3.11.3.4.1 Residual Adverse Impacts

There are no residual adverse impacts to wetlands and riparian zones associated with the No Action Alternative.

3.11.3.5 Partial Backfill Alternative

Although 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 (approximately 527 acres) would be reclaimed with growth media and seeded, the impacts to wetland and riparian areas would be similar to those described for the Proposed Action. The absence of water in the open pit would increase the amount of water available to wetlands and riparian areas as compared to the Proposed Action, particularly related to areas close to the open pit. Under this alternative, approximately 100 ac of evaporation from the pit lake would be prevented, and presumably that water would affect ground water resources.

- **Impact 3.11.3.5-1:** The Partial Backfill Alternative would not result in the possible removal or disturbance of wetlands in the Project Area.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.11.3.5-2:** Phreatophyte vegetation 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 in the area of these plants would potentially cause a change in the those vegetation communities to more xeric species with fewer ecological attributes of stability and altered succession.

Significance of the Impact: The impact is considered potentially significant and mitigation is discussed below.

- **Mitigation Measure 3.11.3.5-2:** The BLM would provide EML with 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 there is insufficient water to support phreatophytes or aquatic-dependent species, the BLM may provide a salt scrub, or other appropriate, seed mix. The BLM would provide this seed mix at the time the mitigation would be implemented.

- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.11.3.5-2 would reduce potential impacts to phreatophyte vegetation from water stress due to the water table drawdown during Project activities. Reseeding with appropriate seed mixes would reduce long-term impacts associated with the loss of phreatophyte vegetation.

- **Impact 3.11.3.5-3:** Vegetation dependent on springs, seeps, and perennial streams (i.e., riparian vegetation) would potentially experience water stress due to the water table drawdown associated with mine dewatering and subsequent filling of the open pit. Lowering of the water table in the area where these plants are located would potentially cause a decline in the riparian vegetation community.

Significance of the Impact: Potential impacts to riparian vegetation areas within the area directly or indirectly affected by Project activities would be monitored as outlined in Section 2.1.15 and the Plan. The impact is considered potentially significant.

- **Mitigation Measure 3.11.3.5-3:** As stated in Mitigation Measure 3.2.3.3-2a, specific mitigation for the two perennial stream segments and 22 perennial or potentially perennial spring sites are outlined in Table 3.2-9. Implementation of the mitigation outlined in this table would result in up to 46.3 acres of additional surface disturbance associated with the pipeline construction and maintenance. This supplemental water should sustain riparian vegetation. All riparian vegetation disturbed by the Project would be replaced on site at a three to one ratio with local cuttings, plugs, or seeds.
- **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 to very 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.

3.11.3.5.1 Residual Adverse Impacts

Following Project completion and reclamation, residual adverse impacts to wetland and riparian zones from the Partial Backfill Alternative would consist of a gradual return of flows to those springs, seeps, and perennial streams that had 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.

3.11.3.6 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 riparian areas from this alternative would be similar to those for the Proposed Action.

- **Impact 3.11.3.6-1:** The Off-Site Transfer of Ore Concentrate for Processing Alternative would not result in the removal or disturbance of wetlands in the Project Area.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.11.3.6-2:** Phreatophyte vegetation 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 in the area of these plants would potentially cause a change in those vegetation communities to more xeric species with fewer ecological attributes of stability and altered succession.

Significance of the Impact: The impact is considered potentially significant and mitigation is discussed below.

- **Mitigation Measure 3.11.3.6-2:** The BLM would provide EML with 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 there is insufficient water to support phreatophytes or aquatic-dependent species, the BLM may provide a salt scrub, or other appropriate, seed mix. The BLM would provide this seed mix at the time the mitigation would be implemented.
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.11.3.6-2 would reduce potential impacts to phreatophyte vegetation from water stress due to the water table drawdown during Project activities. Reseeding with appropriate seed mixes would reduce long-term impacts associated with the loss of phreatophyte vegetation.
- **Impact 3.11.3.6-3:** Vegetation dependent on springs, seeps, and perennial streams (i.e., riparian vegetation) 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 in the area where these plants are located would potentially cause a decline in the riparian vegetation community.

Significance of the Impact: Potential impacts to riparian vegetation areas within the area directly or indirectly affected by Project activities would be monitored as outlined in Section 2.1.15 and the Plan. The impact is considered potentially significant.

- **Mitigation Measure 3.11.3.6-3:** As stated in Mitigation Measure 3.2.3.3-2a, specific mitigation for the two perennial stream segments and 22 perennial or potentially perennial spring sites are outlined in Table 3.2-9. Implementation of the mitigation outlined in this table would result in 46.3 acres of additional surface disturbance associated with the pipeline construction and maintenance. This supplemental water should sustain riparian vegetation. All riparian vegetation disturbed by the Project would be replaced on site at a three to one ratio with local cuttings, plugs, or seeds.
- **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 to very 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.

3.11.3.6.1 Residual Adverse Impacts

Following Project completion and reclamation, residual adverse impacts to wetland and riparian zones from the Off-Site Transfer of Ore Concentrate for Processing Alternative would consist of

a gradual return of flows to those springs, seeps, and perennial streams that had 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.

3.11.3.7 Slower, Longer Project Alternative

Impacts from the Slower, Longer Project Alternative would occur over a period approximately twice as long in duration compared to the Proposed Action. As discussed in Section 3.2.3, the surface area predicted to be impacted by the drawdown by this alternative is similar to, but slightly different than, the Proposed Action. The differences between the predicted drawdown area is illustrated on Figure 3.2.28. Impacts to riparian vegetation as a result of the Slower, Longer Project Alternative are expected to be similar to the Proposed Action at the end of the Project.

- **Impact 3.11.3.7-1:** The Slower, Longer Project Alternative would not result in the removal or disturbance of wetlands in the Project Area.

Significance of the Impact: The impact is not considered significant. Based on the conclusions from the analysis, no additional mitigation is proposed.

- **Impact 3.11.3.7-2:** Phreatophyte vegetation 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 in the area of phreatophytes would potentially cause a change in those communities to more xeric species with fewer ecological attributes of stability and altered succession.

Significance of the Impact: The impact is considered potentially significant and mitigation is discussed below.

- **Mitigation Measure 3.11.3.7-2:** The BLM would provide EML with 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 there is insufficient water to support phreatophytes or aquatic-dependent species, the BLM may provide a salt scrub, or other appropriate, seed mix. The BLM would provide this seed mix at the time the mitigation would be implemented.
- **Effectiveness of Mitigation and Residual Effects:** Mitigation Measure 3.11.3.7-2 would reduce potential impacts to phreatophyte vegetation from water stress due to the water table drawdown during Project activities. Reseeding with appropriate seed mixes would reduce the long-term impacts associated with the loss of phreatophyte vegetation.
- **Impact 3.11.3.7-3:** Vegetation dependent on springs, seeps, and perennial streams (i.e., riparian vegetation) 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 in the area where these plants are located would potentially cause a decline in the riparian vegetation community.

Significance of the Impact: Potential impacts to riparian vegetation areas within the area directly or indirectly affected by Project activities would be monitored as outlined in the Plan. The impact is considered potentially significant.

- **Mitigation Measure 3.11.3.7-3:** As stated in Mitigation Measure 3.2.3.3-2a, specific mitigation for the two perennial stream segments and 22 perennial or potentially perennial spring sites are outlined in Table 3.2-9. Implementation of the mitigation outlined in this table would result in up to 46.3 acres of additional surface disturbance associated with the pipeline construction and maintenance. This supplemental water should sustain riparian vegetation. All riparian vegetation disturbed by the Project would be replaced on site at a three to one ratio with local cuttings, plugs, or seeds.
- **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 to very 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.