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Tonkin Springs Mine
Final Plan for Permanent Closure

Location: **Eureka County, Nevada**

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List of Acronyms

§	Typographical character denoting a particular section of a document
ABA	Acid Base Accounting
ACEC	Areas of Critical Environmental Concern
AML	Appropriate Management Level
amsl	above mean sea level
AO	Authorized Officer
ARPA	Archaeological Resources Protection Act
AUM	Animal Unit Months
BLM	Bureau of Land Management
BMD	Battle Mountain District
BMP	Best Management Practices
BMRR	Bureau of Mining Regulation and Reclamation
c.y.	Cubic yards
CEQ	Council of Environmental Quality
CESA	Cumulative Effects Study Area
CFR	Code of Federal Regulations
CPE	Corrugated Polyethylene
DOI	Department of Interior
e.g.	Abbreviation for Latin phrase exempli gratia, meaning ‘for example’
EA	Environmental Assessment
EDC	Engineering Design Change
EDR	Engineering Design Report
EIS	Environmental Impact Statement
EO	Executive Order
et seq.	Abbreviation for Latin phrase et sequentes, meaning 'and the following things’
etc.	Abbreviation for Latin phrase et cetera, meaning and ‘other things’
FDO	French Drain Outfall
FLPMA	Federal Land Policy Management Act
FONSI	Finding of No Significant Impact
FPPC	Final Plan for Permanent Closure
FWS	Fish and Wildlife Service
gpm	Gallons per minute
HDPE	High Density Polyethylene
HFI	Healthy Forests Initiative
HMA	Herd Management Area
HUC	Hierarchical Unit Classification
i.e.	Abbreviation for Latin phrase id est, meaning ‘that is’
in.	Inches
IWM	Integrated Weed Management
L	Liter
lbs.	Pounds
LCRS	Leakage collection and recovery system
LCT	Lahontan Cutthroat Trout
LLDPE	Low density Polyethylene
MBTA	Migratory Bird Treaty Act
MDB&M	Mount Diablo Baseline and Meridian
mg	milligrams
MLFO	Mount Lewis Field Office
MMA	Maximum Manageable Area

MMI	McEwen Mining Inc.
MMPA	Mining and Mineral Policy Act of 1970
MSHA	Mining Safety and Health Administration
MWMP	Meteoric Water Mobility Procedure
NAC	Nevada Administrative Code
NAGPRA	Native American Graves Protection and Repatriation Act
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NDOA	Nevada Department of Agriculture
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act
NHD	National Hydrography Database
NHPA	National Historic Preservation Act
NNHP	Nevada Natural Heritage Program
NOAV	Notice of Alleged Violation
NRCS	National Resource Conservation Service
^{o}F	Degrees Fahrenheit
OHV	Off Highway Vehicles
PGH	Preliminary General Habitat
PLS	Pure Live Seed
APO	Amended Plan of Operations
PPH	Preliminary Primary Habitat
psf	Pounds per square foot
RCRA	Resource Conservation and Recovery Act
RFFA	Reasonable Foreseeable Future Actions
RMP	Resource Management Plan
ROD	Record of Decision
s.u.	Standard Units
SD	Secure Digital
SLERA	Screening Level Ecological Risk Assessment
SSS	Special Status Species
TCP	Traditional Cultural Property
THA	Temporary Housing Area
TSCT	Tailings Seepage Collection Tank
TSF	Tailing Storage Facility
TSF	Tailings Storage Facility
TSLLC	Tonkin Springs LLC.
UNCE	University of Nevada Cooperative Extension
USGS	U.S. Geological Society
VRM	Visual Resource Management
WAD	Weak Acid Dissociable
WPCP	Water Pollution Control Permit

1.0 Introduction

This Environmental Assessment (EA) analyzes and discloses the potential environmental impacts associated with the proposed *Amendment to Plan of Operations #NVN-067881 – Final Plan for Permanent Closure for the Tonkin Springs Mine*, dated November 2012. The Project proponent is Tonkin Springs LLC (TSLLC), a wholly-owned subsidiary of McEwen Mining Inc. (MMI). The Proposed Action under consideration in this EA will allow for the implementation of the Final Plan for Permanent Closure (FPPC) for the Tonkin Springs Mine.

The Tonkin Springs Mine is located in the northern Simpson Park Mountains in Eureka County, Nevada, approximately 40 miles northwest of the town of Eureka (**Figure 1**). The Mine Plan Area, for which the proposed Amendment to the Plan of Operations (APO) #NVN-067881 pertains, encompasses approximately 3,000 acres of lands administered by the U.S. Department of the Interior, Bureau of Land Management, Mount Lewis Field Office (BLM) (**Figure 2)**. The facility layout, including the open pit TSP-1, tailings storage facility (TSF), heap leach pad, Event Pond and associated infrastructure and facilities are depicted in **Figures 3** and **4**.

1.1 Purpose and Need for Action and Decision to Be Made

The BLM's need to implement the closure modifications discussed in APO #NVN-067881 is to implement the State-approved FPPC, and fully close the remaining mine facilities at the Tonkin Springs Mine. Closure modifications discussed in the APO #NVN-067881, include decommissioning and clean-closing the tailings impoundment, relocating sulfide ore stockpiles and the TSP-1 waste rock dump, backfilling the TSP-1 open pit, and constructing a new evaporation pond for post-closure fluid management of TSP-1 seepage water and heap leach pad draindown.

TSLLC submitted the APO to the BLM in November 2012 in accordance with BLM Surface Management Regulations, Title 43 of the Code of Federal Regulations (CFR) Part 3809 (as amended). The BLM is required to comply with the National Environmental Policy Act (NEPA) to analyze the potential impacts that the Proposed Action and selected alternatives would have on the human environment.

1.2 Scoping and Issues

The internal BLM specialist scoping meeting was held on December 6, 2012 to identify the specific resources considered in this EA. These specific resources are discussed in greater detail in Section 3 of the EA, and included considerable discussion on fencing and range management post closure, as well as habitat restoration. Water management and potential impacts to groundwater were also discussed. No other specific resource issues were addressed during this scoping meeting.

1.3 Conformance Statement

This EA is prepared in conformance with the NEPA, associated Council of Environmental Quality (CEQ) regulations (40 CFR § 1500-1508), and BLM NEPA Handbook H-1790-1 (BLM, 2008a). The BLM Handbook provides instructions for compliance with the CEQ regulations for implementing the procedural provisions of NEPA and the Department of the Interior's (DOI's) manual on NEPA (516 DM 1-7).

The Proposed Action is in conformance with the Shoshone-Eureka Resource Area (SERA) Resource Management Plan (RMP) Objectives (Shoshone-Eureka RMP Record of Decision dated 1986 and Shoshone-Eureka RMP Amendment, Record of Decision dated 1987). In addition, the Proposed

Action is in conformance with the Eureka County 1973 Master Plan (most recently updated in 2010), which contains a description of land uses, restrictions on development, and recommendations for future land use planning. Policies within the Eureka County Master Plan promote the expansion of mining operations/areas, but also the protection of the human and natural environment, including reclamation and/or restoration of authorized disturbances.

The Mining and Mineral Policy Act of 1970 (MMPA) mandates that federal agencies ensure that closure and reclamation of mine operations be completed in an environmentally responsible manner. The BLM's long-term reclamation goals are to shape, stabilize, revegetate, or otherwise treat disturbed areas in order to provide a self-sustaining, safe, and stable condition providing productive use of the land, which conforms to the approved land use plan for the area.

1.4 Previous NEPA Assessments

A number of plan of operations amendments, and subsequent NEPA analyses have been conducted for the Tonkin Springs Mine. These NEPA analyses, from which this EA has been tiered, include:

- NV060-EA1-6 (1980);
- N66-EA5-21 (1985);
- N66-EA7-43 (1987);
- N66-EA7-45 (1987);
- N66-EA8-20 (1988);
- N66-EA8-65 (1988);
- N66-EA9-67 (1989);
- N64-EA2-03 (1991);
- NV063-EA00-43 (2001); and
- NV062-EA08-150 (2009).

The current EA is tied mostly to the two most recent EAs, NV063-EA00-43 (2001) and NV062-EA08-150 (2009), dealing with an expansion to the site-wide exploration program and water management system modifications, respectively.

2.0 Proposed Action and Alternatives

2.1 Proposed Action

The Tonkin Springs Mine is located on BLM-administered public land in Eureka County, Township 23.5 North, Range 49 East, Sections 2, 3, and 4, and in Township 24 North, Range 49 East, Sections 20, 21, 27, 28, 29, 32, 33, and 34, Mount Diablo Baseline and Meridian (MDB&M), approximately 40 miles northwest of the town of Eureka, Nevada. The project consists of a heap leach pad, an event pond, a tailings impoundment and seepage collection tank, a mill and process plant area, ancillary facilities (e.g. piping), and several open pit and waste rock disposal facilities. All mining and processing activities were suspended in 1990 and have been in temporary closure since this time.

APO #NVN-067881 (Proposed Action) includes closure modifications that will allow for the final closure of the Tonkin Springs Mine. These modifications can be summarized into the three primary activities, as described below.

1. Relocation of sulfide ore stockpiles, waste rock dump TSP-1 and adjacent sulfide-bearing portions of the haul road back into the TSP-1 open pit. A portion of TSP-1 waste rock dump will be used in construction of a tailings disposal cell within the TSP-1 open pit, and the remainder as backfill to achieve final grades that facilitate routing stormwater away from the backfilled pit.
2. Decommissioning and clean-closure of the existing Tonkin Springs tailings impoundment, including:
    a. Construction of a tailings disposal cell within the middle bench of the TSP-1 Pit, including installation of a geomembrane top liner after filling;
    b. Relocation of existing tailings (approximately 40,000 tons) and an estimated 2-foot thickness of the underlying soil into the proposed tailings disposal cell;
    c. Removal of existing subsurface seepage collection system (including piping network within impoundment, embankment underdrain, and tailings seepage collection tank (TSCT) from the tailings impoundment area; and
    d. Utilization of embankment fill (originally constructed from alluvium borrowed within impoundment footprint) to cover entire disturbed area within the tailings impoundment footprint with a minimum of 18 inches of soil and revegetate with BLM-approved certified noxious weed free seed mix (refer to **Table 2-7** in Section 2.4).
3. Construction of a new evaporation pond for post-closure fluid management of TSP-1 Pit seepage water and heap leach pad draindown (within existing disturbed area), including construction of new seepage/draindown conveyance pipelines and decommissioning and removal of existing interim water management system (seepage/draindown conveyance pipeline, pH adjustment system, and Event Pond).

The proposed amendments are also described in Section 5 of the *Tonkin Spring Mine Final Plan for Permanent Closure* contained in Attachment 1 of the APO, and do not result in any additional surface disturbance within the Mine Plan Area. The FPPC was originally submitted to the Nevada Division of Environmental Protection, Bureau of Mining Regulation and Reclamation (BMRR) on November 24, 2010 (with several subsequent revisions), and approved by that agency on March 8, 2012. It is the mission of BMRR to ensure that Nevada's waters are not degraded by mining operations and that the

lands disturbed by mining operations are reclaimed to safe and stable conditions to ensure a productive post-mining land use.

2.1.1 Closure Design Approach and Details

TSLLC's approach in developing revised closure and reclamation actions for the Tonkin Springs Mine is to minimize post-closure fluid management requirements by consolidating potential source materials derived from the same origin such that zero-discharge fluid management methods can be utilized to collect and contain seepage and draindown flows. The proposed comprehensive approach to tailings impoundment, ore stockpile, and TSP-1 Pit closure not only provides for post-closure fluid management, but also minimizes the areal extent of potential source material throughout the site. The proposed closure actions are also described in the FPPC in Attachment 1 (refer to Section 5 and the design drawings in Appendices H and I) of the APO. Each of the proposed actions is described in the following sections.

2.1.2 Relocate Waste Rock Dump TSP-1

As part of the closure of TSP-1 Pit, TSLLC proposes to relocate TSP-1 waste rock dump and adjacent sulfide-bearing portions of the haul road into TSP-1 Pit. It is estimated that TSP-1 waste rock contains approximately 64,000 cubic yards (cy) of material, and the sulfide-bearing material in the haul road is estimated to comprise another 5,000 cy.

TSLLC will close the TSP-1 Pit in general accordance with the FPPC, which includes relocating the nearby sulfide ore stockpiles back into the open pit. TSLLC proposes to also relocate the TSP-1 waste rock dump (and part of the adjacent haul road) and tailings solids from the tailings impoundment back into the TSP-1 Pit as well. Tailings will be placed in a disposal cell constructed as described in Section 4.1.1 of the FPPC and in Section 2.1.3 below. Approximately 19,000 cy of TSP-1 waste rock dump would be used for in-pit, disposal cell construction. The remainder of the TSP-1 waste rock dump will be used in achieving the final TSP-1 Pit closure design grades shown on the design drawings in Appendix H of the FPPC.

2.1.3 Decommission and Clean-Close the Existing Tailings Impoundment

In contrast to closure and reclamation by regrading and covering in place, TSLLC proposes to clean-close the tailings impoundment by completely removing the stored tailings and placing them in an engineered tailings disposal cell within the middle bench of TSP-1 Pit. Detailed design drawings for TSP-1 Pit closure, including the proposed tailings disposal cell to be constructed within TSP-1 Pit, are included in Appendix H of the FPPC.

TSLLC would continue to actively manage water collected in the tailings impoundment on a seasonal basis to support tailings removal. It is currently anticipated that the tailings (estimated to be 40,000 tons) would be transported via conventional truck and haul methods to the disposal cell and compaction would be achieved upon placement in the cell. The disposal cell would be constructed with TSP-1 waste rock dump material and include the following actions:

1. Regrade existing slope between the upper and middle bench using cut-to-fill and construct containment berm to the lines and grades shown on the drawings in Appendix H of the FPPC;
2. Construct a gravel drain along the regraded toe of the slope between the middle and upper benches and install an 80-mil HDPE liner over the regraded slope to divert potential horizontal flows around the tailings disposal cell;
3. Relocate tailings to disposal cell using conventional truck and haul methods, place and compact in disposal cell;

4. Place over-excavated soil from impoundment within tailings footprint on top of tailings disposal cell;
5. Once the disposal cell is filled and the final surface is graded as shown on the design drawings, construct a geomembrane/geotextile top liner to prevent infiltration of meteoric water through the tailings; and
6. Incorporate the disposal cell into final TSP-1 Pit backfilling and regrading, including placement of growth media over the final lined surface and revegetation with the BLM approved seed mix (refer to **Table 2-7** in Section 2.4).

Once all of the tailings are removed from the tailings impoundment, TSLLC would remove the existing impoundment underdrain piping system and dispose of it either in the on-site solid waste landfill or at an off-site permitted disposal facility. TSLLC would then remove as much of the subgrade material as necessary such that the results of Meteoric Water Mobility Procedure (MWMP) and Acid Base Accounting (ABA) testing on the soil material to be left in place are similar to adjacent background soils and the concentrations of weak acid dissociable (WAD) cyanide and nitrate+nitrite (as reported by the MWMP testing) do not exceed Nevada Division of Environmental Protection, Bureau of Mining Regulation and Reclamation (NDEP-BMRR) reference values. Depending on the WAD cyanide and nitrate + nitrite concentrations of these over-excavated soils, TSLLC may request approval to incorporate these soils in the general pit backfill outside the designated tailings disposal area. Based on the low permeability of the subgrade soils it is currently anticipated that up to 2.0 feet of subgrade soil would have to be removed within the current footprint of the tailings.

Once the subgrade has been determined to satisfy these criteria, TSLLC would complete the following:

1. Remove the embankment underdrain in the embankment key;
2. Remove and dispose of the existing TSCT and backfill the hole with compacted alluvial soil;
3. Cap the ends of all buried pipelines to remain in place and remove and dispose of all surface pipeline and other facilities associated with the tailings impoundment and TSCT;
4. Regrade a portion of the embankment (growth media) over the former tailings footprint to a minimum depth of 18 inches and stockpile excess material near topsoil stockpile TS-1; and
5. Revegetate the final surface with the BLM approved seed mix (refer to **Table 2-7** in Section 2.4).

TSLLC has planned for up to three years to relocate the tailings and complete closure construction within the tailings impoundment. After the completion of closure activities, the existing four-strand barbed wire livestock fence that encloses the tailings impoundment would be removed as determined by the BLM Field Manager. The decision to remove the existing four-strand barbed-wire livestock perimeter fence would be made after reclamation standards have been met.

2.1.4 Construct New Evaporation Pond for Post-Closure Fluid Management

In contrast to the current Plan of Operations (Plan), which calls for expansion and conversion of the existing Event Pond into a 5-acre evaporation pond, TSLLC proposes to close the existing Event Pond in place and construct a new double-lined evaporation pond designed to provide for interim fluid management during the completion of site closure activities, and for long-term post-closure fluid management. With the removal of the tailings impoundment and its seepage collection system, the only fluids requiring post-closure management will be the nominal heap leach pad draindown and potential seasonal flows from the TSP-1 Pit and sump. TSLLC proposes to build a 2-acre (base area)

evaporation pond, which is slightly larger than the existing Event Pond, to manage interim TSP-1 and heap draindown flows.

A review of the sump inflow data in **Graph 1** shows decreasing trends in inflow rates during summer and fall between the annual influences of winter precipitation and spring snowmelt. While the data is heavily influenced by monthly precipitation totals, the decreasing slope of each line fitted to the summer and fall seep data indicates the flow rate from TSP-1 will decline rapidly once the influences of direct precipitation and snowmelt are removed from the pit water balance. Based on these data, seepage flow from the pit is anticipated to reach a flow rate of around 1.0 gpm or less within one year of completion of Proposed Action (i.e., completion of TSP-1 backfilling activities). This flow rate, when combined with the equilibrated heap leach pad draindown flow rate of around 1.0 gpm, will give a total combined flow rate into the proposed evaporation pond of 2 gpm, the capacity of the proposed evaporation pond to passively manage fluid without an increase in inventory from year to year. Active evaporation within the proposed evaporation pond is therefore assumed to be necessary for approximately one year to manage draindown flow rates until the post-closure flow rate from TSP-1 is achieved.

The evaporation pond has been sized based on the current downward trends in both TSP-1 sump outflow and heap leach pad draindown flow rates, and an estimated combined baseline flow rate of 2.0 gallons per minute (gpm). Refer to Section 2.2.2 for a discussion of current and anticipated seepage flow rates. A pond water balance and detailed design drawings are included in Appendix I of the FPPC in Attachment 1 of the APO.

New evaporation pond construction will include the following elements:

1. Cut-to-fill excavation and pond embankment construction to the lines and grades shown on the drawings using native alluvial soil (estimated to require approximately 16,000 cy of cut-to-fill based on the design in Appendix I of the FPPC in Attachment 1 of the amended APO);
2. Install double liner and leakage collection and recovery system (LCRS), including an 80-mil HDPE primary liner underlain by 60-mil Low Density Polyethylene (LLDPE) Agru Drain Liner™ (estimated to include approximately 188,500 sf each for primary and secondary liners);
3. Install geonet, conveyor belt with knotted rope from the surface, or other escape ramp along one pond corner to provide for human or animal egress from the pond (note: sideslopes configured at 3H:1V or flatter);
4. Install sand-filled geomembrane ballast tubes along pond base and halfway up the sideslopes to counter wind uplift forces during periods when the evaporation pond is expected to be dry;
5. Install new seepage conveyance pipeline from TSP-1 sump drain and heap leach pad to new evaporation pond (estimated to include approximately 2,000 feet of dual-contained HDPE pipeline); and
6. Install perimeter fencing constructed in accordance with Nevada Department of Wildlife (NDOW) standards (estimated to require approximately 1,880 linear feet of fencing).

If the baseline flow rates upon which the evaporation pond design are based are not realized within the three years following closure construction in TSP-1 Pit, TSLLC would design, construct and permit a second evaporation pond, to be used in conjunction with the first, to manage post-closure draindown and TSP-1 seepage flows. TSLLC has outlined an area within which a second pond could be sited based on existing site topography. TSLLC anticipates that, if required, doubling the size of the proposed pond would be more than sufficient to manage the combined flows. The proposed location of the evaporation pond, and optional site for a second pond, if necessary, are shown on **Figure 4**.

2.1.5 Estimated Construction Schedule

The estimated schedule for performing the proposed closure and reclamation work is provided in **Table 2-1** below.

Table 2-1: Anticipated Schedule for Closure Activities

Activity	Estimated Start (following NDEP-BMRR/BLM approval)	Estimated Completion
Prepare Environmental Design Changes (EDCs) for TSP-1 Pit and Tailings Impoundment Closure and Evaporation Pond Construction for submittal to NDEP-BMRR	Year 1	Year 2
Construct evaporation pond and conveyance pipelines	Year 1	Year 2
Tailings Storage Facility - eliminate pool inventory	Year 1	Year 3
Construct tailings disposal area	Year 2	Year 2
Relocate tailings from impoundment to disposal cell in TSP-1 Pit	Year 2	Year 3
Construct gravel drain in sump, complete backfill, place cover, construct stormwater controls	Year 3	Year 3
Monitor TSP-1 sump flows to establish basis of additional evaporation pond design (if required)	ongoing	Year 3
Equipment and waste inventory and characterization of sub-surface soils for process buildings and tanks	Year 2	Year 5
Complete process area salvage, demolition and clean-up, including buildings, tanks and other facilities not identified for future use	Year 2	Year 5
Construct fencing around TSP-1 Pit, TSP-6 Pit and Rooster Pit	Year 5	Year 5
Reclamation of remaining facilities	Year 1	Year 5

2.1.6 Monitoring Plan Modifications

Site-wide monitoring is currently performed in accordance with Water Pollution Control Permit (WPCP) NEV0085021. Existing fluid management system monitoring related to TSP-1 Pit and heap leach pad water includes leak detection monitoring at all downstream open ends of the 8-inch leak detection pipe. The Proposed Action would require a new leak detection monitoring point at the discharge location of the new pipeline segment into the Evaporation Pond. In addition, the sampling and measurement location for heap leach pad draindown and TSP-1 Pit water would move to their respective discharge locations into the new Evaporation Pond. Finally, the combined TSP-1 and heap leach flows typically measured and sampled at the discharge location to the TSF would not be sampled during fluid management in the Evaporation Pond.

Open-pit highwall safety fences, signs and other structures to remain following the completion of closure and reclamation activities would be inspected regularly for indications of wear or loss in functionality and will be repaired or replaced, as necessary.

2.2 Existing Mine Facilities

Current operations at the Tonkin Springs Mine primarily consist of exploration activities and closure of historic mine process facilities that are not needed for potential future development, if realized. **Figure 3** shows the location of the existing mine facilities. The major components of the existing operation include the closed and reclaimed heap leach pad, the TSF and associated seepage and embankment drain collection system, TSP-1 Pit and sump, the Event Pond (process pond), several small waste rock dumps and open pits, bio-oxidation facilities, buildings and tanks, storage and

equipment areas, and a fluid management system that manages flows from the heap leach pad and TSP-1 Pit in either the Event Pond or the tailings storage facility. A general layout of the site showing existing site facilities is shown on **Figure 3**. **Table 2-2** outlines the existing surface disturbance by type of disturbance.

Table 2-2: Existing Mining Related Surface Disturbance

Component	Existing Surface Disturbance (acres)
Open Pits	67.6
Waste Rock Dumps	22.0
Haul Roads	64.7
Tailings Storage Facility	16.6
Mill and Heap Facility	19.2
Access Road	18.8
Temporary Housing Area	6.3
Topsoil Stockpiles	11.8
Ancillary Facilities	221.5
Exploration	33.6
Totals	482.1

The Proposed Action(s) will not result in any additional surface disturbance at the Tonkin Springs Mine site. All activities will be conducted within the approved disturbance footprints, as outlined above.

2.2.1 Roads

The existing road system includes access and secondary roads, and haul roads. These roads are shown on **Figure 4**. Haul roads comprise approximately 64.7 acres of the total road related disturbance. The remaining 18.8 acres is the access road with an average disturbance width of 60 feet. Roads were generally constructed with standard cut and fill techniques. There are approximately 1,280 linear feet of culverts throughout the mine site. Culverts range in diameter from 24 to 36 inches and in length from 60 linear feet to 160 linear feet.

2.2.2 Open Pits

There are nine open pits within the mine site, including TSP-1, TSP-2, TSP-3, TSP-4, TSP-5, TSP-6, TSP-6E, TSP-7 and Rooster Pit. The open pits vary in size from 27.0 acres (TSP-5) to 0.8 acres (TSP-6E) and encompass a total surface area of 67.6 acres. With the exception of TSP-1, the material mined in the open pits was of oxide composition. Sulfide mineralization was present at a relatively shallow depth in some of the open pits, but because of metallurgical difficulties, it could not be processed on the heap leach pad and the bio-oxidation facility was never put into full production. Consequently, mining was halted in the open pits either when the ore body was mined out, or when sulfide materials were encountered. As a result, the open pits are generally shallow and do not penetrate the local groundwater table.

During the 2006 field season, TSLLC regraded and partially backfilled TSP-2, TSP-3, TSP-5, TSP-6, TSP-6E and TSP-7 Pits with available oxide waste rock, minimizing the potential for long-term acid generation. The TSP-5 open pit collected snowmelt and stormwater runoff until it was regraded to a free draining condition with respect to stormwater in accordance with NAC 445A.429.2.

Open pits with highwall cut slopes have been fenced with 4-strand barbed-wire, including TSP-2, TSP-3, TSP-5 and TSP-7. A portion of the existing, 4-strand, barbed-wire livestock perimeter fence

may be left along the highwall above TSP-4 for public safety; The decision to remove the remainder of this fence would be made after reclamation standards have been met. Existing fences are shown on **Figure 3** in this document and in the FPPC in Attachment 1 of the APO. A discussion of the current condition of each pit is provided in the following sections.

TSP-1 Pit

Sulfide mineralization has been exposed in TSP-1 Pit as a result of the mining of the shallow oxide ore cap. The TSP-1 Pit is a sidehill pit with three benches cut into the surrounding hill. The upper bench of the TSP-1 Pit consists entirely of oxidized limestone, chert and quartzite. The middle and lower benches of the pit intersect sulfide mineralization and consisted of dark grey to black chert/quartzite and limestone. During the 2010 field reconnaissance, four samples were collected from the TSP-1 pit including: one sample of oxide material from the upper bench; one sample from a stockpile of sulfide material on the middle bench; and two samples of sulfide material from the lower bench floor. These samples were submitted for MWMP and ABA testing to confirm the acid generating potential of these materials. The results of the MWMP and ABA testing are provided in **Table 2-3**.

As shown in **Table 2-3**, the upper bench of oxidized limestone, chert and quartzite shows a low potential to generate acid or leach metals. From the ABA data, this sample shows significant neutralizing potential that is confirmed by the alkaline pH value of the MWMP extract. This sample also shows a low potential for metal leaching with all constituents below the NDEP reference values except arsenic, which is slightly above the reference value of 0.01 mg/L. For the samples of sulfide material collected from the middle and lower benches of the TSP-1 pit, acid generation is predicted with NP:AP values less than 3 and NNP values less than 20 eq. kg CaCO3/ton. These samples also show a potential to leach aluminum, antimony, arsenic, manganese, nickel, sulfate and thallium at concentrations above the NDEP reference values under neutral to acidic pH conditions. For sample TSP-1 WRD No. 3 with an MWMP pH around 3 s.u., beryllium, iron and fluoride are also above the NDEP reference values.

TSP-1 Waste Rock Dump

The TSP-1 waste rock dump is located north of the TSP-1 open pit. From an inspection of the sideslopes, the dump materials appear to be a mixture of sulfide waste rock (acid generating) and oxide waste rock (acid neutralizing). In addition, a berm of sulfide material is also present along the western side of the dump along the haul road. For the purposes of TSP-1 dump closure, the sulfide berm along the haul road is considered a part of the dump and will be managed accordingly. In 1999, the pH values obtained from the TSP-1 dump ranged from 1.73 to 8.04 s.u. However, no acid rock drainage has been observed at the toe of the dump or along the haul road berm. In 2010, SRK collected four samples from the upper sideslope of the TSP-1 dump. Consistent with the description of the dump by SRK in 1999, the waste rock samples consisted of a mixture of oxide and sulfide mineralization with the sulfide portion comprising anywhere from 30 to 70 percent. These samples were submitted for MWMP and ABA testing and the results are provided in **Table 2-4**.

The MWMP and ABA results for the waste rock samples are summarized in **Table 2-4** and show that all four samples of TSP-1 waste rock are potentially acid generating with NP:AP values less than 3 and NNP values less than 20 eq. kg CaCO3/ton. The MWMP results are similar to those for the middle and lower benches of the TSP-1 pit with aluminum, arsenic, manganese, nickel, sulfate and thallium above the reference values. In addition, antimony, beryllium, cadmium, fluoride, and iron above the reference values for a few samples. The assessment of acid generation potential from the ABA testing is confirmed by lower pH values of the MWMP extracts, which are below 5 s.u. for three out of the four samples.

TSP-1 Sump Flow Rate and Chemistry

The rate at which the TSP-1 sump water exits the sump via gravity flow and passes through the in-line pH adjustment system is recorded within the ph adjustment vault. These data are reported quarterly as part of regular compliance monitoring for the WPC permit. The sump outflow rates since commissioning the interim fluid management system in 2007 are shown on **Graph 1**. The flow rates show a significant seasonal response to snowmelt and precipitation, but also show a decreasing trend in the summer baseline flow rate, likely due to annual efforts in 2007, 2008 and 2009 to close more than 80 open boreholes within TSP-1 Pit. Note that flows rates during the summer of each year shown on **Graph 1** are likely influenced by borehole location and closure efforts occurring at that time and do not reflect long-term baseline flow rates.

A review of the sump inflow data in **Graph 1** (below) shows decreasing trends in inflow rates during summer and fall between the annual influences of winter precipitation and spring snowmelt. While the data is heavily influenced by monthly precipitation totals, the decreasing slope of each line fitted to the summer and fall seep data indicates the flow rate from TSP-1 will decline rapidly once the influences of direct precipitation and snowmelt are removed from the pit water balance. Based on these data, seepage flow from the pit is anticipated to reach a flow rate of around 1.0 gpm or less within one year of implementation of closure activities. This flow rate, when combined with the equilibrated heap leach pad draindown flow rate of around 1.0 gpm, will give a total combined flow rate into the proposed evaporation pond of 2.0 gpm, the capacity of the proposed evaporation pond to passively manage fluid without an increase in inventory from year to year. Active evaporation within the proposed evaporation pond is therefore assumed to be necessary for approximately one year to manage draindown flow rates until the anticipated 1.0 gpm post-closure flow rate from TSP-1 is achieved.

TSP-1 sump chemistry is the result of meteoric water, lateral throughflow or recharge from the upgradient watershed, and potentially upwelling flows from remaining open boreholes within the TSP-1 pit boundary passing through the sulfide-mineralized rock forming the base of the middle and lower bench. The chemistry of TSP-1 sump water is measured quarterly in accordance with the WPC permit. Samples are obtained for testing from the free water surface within the sump. Results from the last full year of sampling (May 2009 through May 2010) are summarized in **Table 2-5** along with NDEP reference values for comparison.

As shown in **Table 2-5**, there has been no significant change in the TSP-1 sump chemistry over the past several years year of monitoring. The water quality of the TSP-1 sump is acidic with corresponding high metals concentrations. Constituents that are consistently elevated above the NDEP reference values include aluminum, arsenic, beryllium, cadmium, fluoride, iron, manganese, nickel, sulfate, thallium, TDS and zinc. Antimony, copper, lead, and magnesium are also occasionally elevated. The poor water quality conditions in the TSP-1 sump are attributed to the movement of shallow groundwater through highly mineralized and fractured media (SRK, 2000) in the TSP-1 pit area. Sulfide oxidation and secondary mineral dissolution in the pit floor and wall rocks increases the concentrations of iron, arsenic, sulfate and metals, and consumes the alkalinity in the groundwater.

Graph 1: TSP-1 Sump Flow Rate

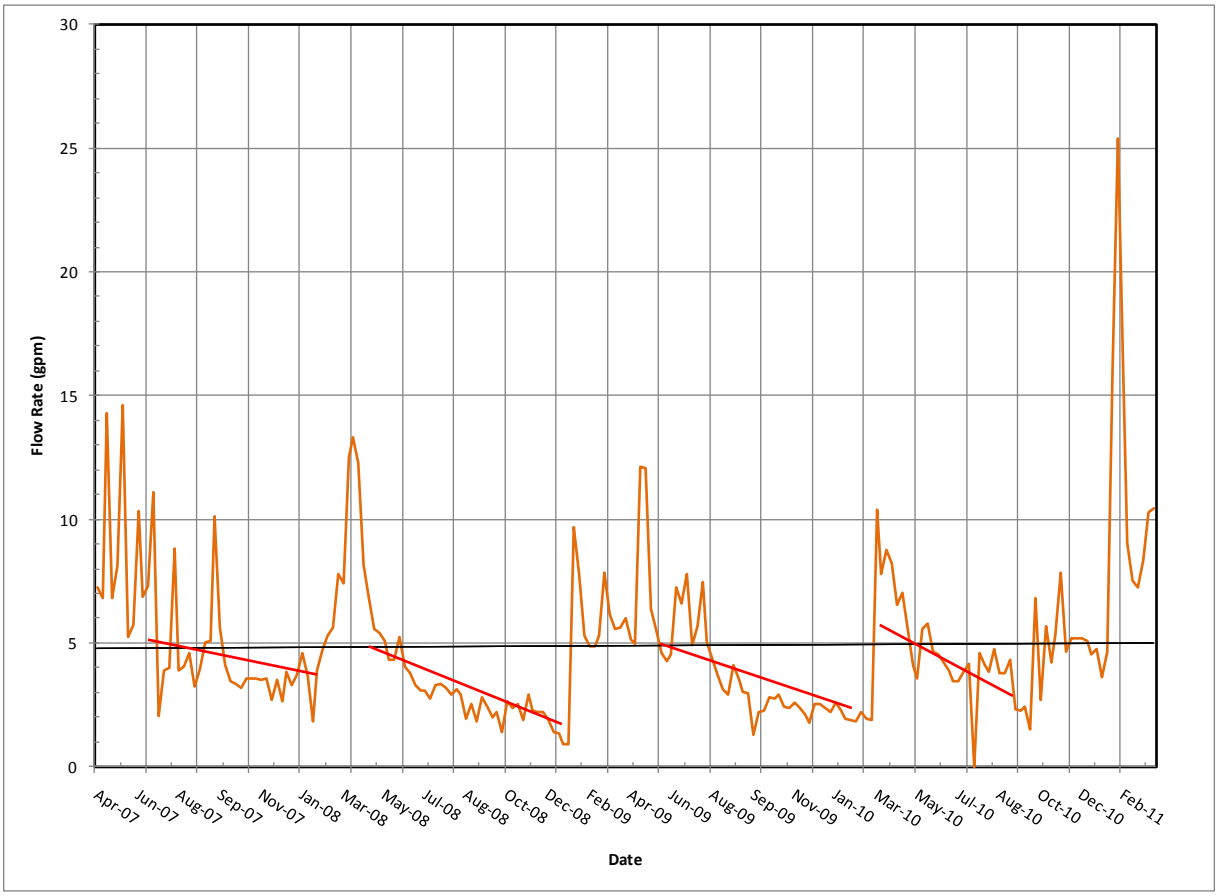

Table 2-3: MWMP and ABA Results for TSP-1 Pit Wall Samples

Parameter	NDEP Reference Value	TSP-1 PIT UPPER BENCH	TSP-1 PIT MIDDLE BENCH SP	TSP-1 PIT MIDDLE/ LOWER BENCH FLOOR No. 1	TSP-1 PIT MIDDLE/ LOWER BENCH FLOOR No. 2
Acidity	--	--	--	--	357
Alkalinity	--	105	27.5	192	<1
Aluminum	0.2	<0.08	0.241	<0.08	45.9
Antimony	0.006	<0.003	0.181	0.117	0.0268
Arsenic	0.01	0.0114	0.643	0.153	2.37
Barium	2	0.114	0.0087	0.0083	0.0088
Beryllium	0.004	<0.002	<0.002	<0.002	0.0064
Cadmium	0.005	<0.002	0.0033	<0.002	0.0032
Chloride	400	1.44	2.32	1.6	1.21
Chromium	0.1	0.0566	<0.006	<0.006	0.031
Copper	1.3	<0.01	<0.01	<0.01	0.523
Fluoride	4	0.447	1.4	2.39	4.23
Iron	0.6	<0.06	0.129	<0.06	15.5
Lead	0.015	<0.003	<0.003	<0.003	<0.003
Magnesium	150	8.06	40.7	16.5	9.16
Manganese	0.1	<0.004	1.45	0.0998	0.763
Mercury	0.002	<0.0002	0.00382	0.00063	0.00035
Nickel	0.1	<0.01	0.109	0.014	0.131
Nitrate+Nitrite	10	0.608	<0.5	<0.5	<0.5
pH (s.u.)	6.5-8.5	8.17	6.5	7.8	3.14
Selenium	0.05	<0.003	0.0108	0.015	0.0047
Silver	0.1	<0.005	<0.005	<0.005	<0.005
Sulfate	500	29.5	1,550	1,440	1,400
Thallium	0.002	<0.001	0.0605	0.00787	0.0967
TDS	1000	156	2,420	2,420	2,190
Zinc	5	<0.01	0.0656	<0.01	0.246
WAD Cyanide		<0.01	<0.01	<0.01	<0.01
Paste pH (s.u.)	--	7.27	5.53	5.72	3.85
ANP[1]	--	80.7	<0.3	<0.3	<0.3
AGP[2]	--	0.51	6.77	4.42	2.6
NNP[3]	--	80.2	-6.77	-4.42	-2.6
NP:AP	--	158.2	0.04	0.07	0.12

All units in mg/L, except as noted.
Shaded values exceed the respective comparative value from NDEP Form 0190 for Profile II constituents.
[1]AP=acid generation potential, in eq. kg $CaCo_3$/ton and
[2]NP=acid neutralization potential, in eq. kg $CaCo_3$/ton
[3]NNP=net neutralizing potential (NP - AP), in eq. kg $CaCo_3$/ton

Table 2-4: MWMP and ABA Results for TSP-1 Waste Rock Samples

Parameter	NDEP Reference Value	TSP-1 WRD No. 1	TSP-1 WRD No. 2	TSP-1 WRD No. 3	TSP-1 WRD No. 4
Acidity	--	--	--	147	105
Alkalinity	--	<1	272	<1	<1
Aluminum	0.2	2.2	<0.08	21.3	14.7
Antimony	0.006	0.00752	0.00564	<0.003	<0.003
Arsenic	0.01	0.0484	0.0241	0.0981	0.0423
Barium	2	0.0135	0.0201	0.0149	0.0119
Beryllium	0.004	<0.002	<0.002	0.0042	0.0023
Cadmium	0.005	0.0035	<0.002	0.0234	0.0265
Chloride	400	2.87	3.52	1.36	<1
Chromium	0.1	<0.006	<0.006	<0.006	<0.006
Copper	1.3	0.035	<0.01	0.356	0.184
Fluoride	4	1.94	1.22	6.54	6.4
Iron	0.6	<0.06	<0.06	0.701	0.494
Lead	0.015	<0.003	<0.003	<0.003	<0.003
Magnesium	150	29.1	29.5	11.8	9.93
Manganese	0.1	6.78	1.85	3.94	2.71
Mercury	0.002	0.00023	<0.0002	<0.0002	<0.0002
Nickel	0.1	0.131	0.036	0.412	0.364
Nitrate+Nitrite	10	0.926	0.955	<0.5	<0.5
pH (s.u.)	6.5-8.5	4.64	7.78	3.78	4.18
Selenium	0.05	<0.003	<0.003	0.0037	<0.003
Silver	0.1	<0.005	<0.005	<0.005	<0.005
Sulfate	500	1280	1,520	1,590	1,420
Thallium	0.002	0.0135	<0.001	0.0329	0.012
TDS	1000	1,890	2,540	2,350	2,240
Zinc	5	0.22	<0.01	1.24	1.7
WAD Cyanide	--	<0.01	<0.01	<0.01	<0.01
Paste pH (s.u.)	--	5.53	5.92	3.52	2.1
ANP[1]	--	1	<0.3	<0.3	<0.3
AGP[2]	--	2.88	2.25	4	7.71
NNP[3]	--	-1.88	-2.25	-4	-7.71
NP:AP	--	0.3	0.13	0.08	0.04

All units in mg/L, except as noted.
Shaded values exceed the respective comparative value from NDEP Form 0190 for Profile II constituents.
[1]AP=acid generation potential, in eq. kg $CaCo_3$/ton and
[2]NP=acid neutralization potential, in eq. kg $CaCo_3$/ton
[3]NNP=net neutralizing potential (NP - AP), in eq. kg $CaCo_3$/ton

Table 2-5: TSP-1 Sump Quarterly Water Quality Results

Parameter						
Alkalinity	--	<2	<2	<2	<2	<2
Aluminum	0.2					
Antimony	0.006			0.003		<0.01
Arsenic	0.01					
Barium	2	<0.01	0.01	0.008	0.009	0.01
Beryllium	0.004					
Cadmium	0.005					
Chloride	400	9	11	9.1	14	10
Chromium	0.1	0.02	0.04	0.013	0.049	0.02
Copper	1.3	0.58	1	0.33		0.57
Fluoride	4					
Iron	0.6					
Lead	0.015	<0.01		0.003		<0.01
Magnesium	150			140		
Manganese	0.1					
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	0.1					
Nitrate	10	<0.5	<0.5	<0.5	<0.5	<0.5
pH	6.5-8.5					
Selenium	0.05	<0.05	<0.02	<0.01	<0.02	<0.05
Silver	0.1	<0.01	<0.004	<0.002	<0.004	<0.01
Sulfate	500					
Thallium	0.002					
TDS	1000					
WAD CN	0.2	<0.005	0.008	<0.005	<0.005	<0.005
Zinc	5					

All units in mg/L, except as noted.
Shaded values exceed the respective comparative value from NDEP Form 0190 for Profile II constituents.

TSP-2

The TSP-2 pit was mined until sulfide ore was encountered. During SRK's 1999 inspection (SRK, 1999), potentially acid generating material was exposed at the base of the pit and a very small seep was noted along the western side of the pit at the toe of the high wall. The pit is currently free draining and there is evidence of surface water flow out of the pit and down the access road. In 1999, SRK noted the presence of a small waste rock dump in the area. The dump was subsequently used to backfill the base of the pit. The regraded pit base was covered with growth media or oxide waste rock and the vegetation is currently well established. There is still evidence of flow from a very small seep at the base of the pit, as noted during SRK's 1999 inspection. The pit walls consist of oxide material and are not anticipated to be acid generating. Approximately 640 feet of four-strand, barbed-wire fence was constructed around the top of the pit highwall and is currently in very good condition. As this is not an enclosing perimeter fence, MMI would not remove this fence post closure.

TSP-3

During SRK's 1999 inspection, a small amount of sulfide ore was exposed in the pit bottom, however, this material is no longer exposed. Loose oxide waste rock near the pit entrance was used to regrade the pit bottom and cover the sulfide material. Approximately 725 feet of four-strand barbed-wire fence was constructed around the top of the pit highwall and is currently in very good condition. As this is not an enclosing perimeter fence, MMI would not remove this fence post closure.

There are two waste rock dumps associated with the TSP-3 pit; TSP-3A and TSP-3B. Neither dump has been regraded and both have angle of repose sideslopes. TSP-3A does not have much vegetation on the top or sideslopes, though most of the dump is alkaline with a high pH. TSP-3B has moderate rabbitbrush and sagebrush vegetation on the top slopes and minimal vegetation on the sideslopes. Based on the 1999 field study (SRK, 1999), the waste rock material in this area is calcareous with paste pH values between 7.9 and 8.58 s.u.

In order to evaluate the stability of the waste rock dump in its current configuration, SRK collected bulk samples of TSP-3A waste rock during the 2010 field investigation and submitted them to Vector Engineering's geotechnical testing laboratory in Grass Valley California for grain size distribution, Atterberg limits and large-scale direct shear testing. Based on the common origin and a visual inspection of TSP-3A and TSP-3B waste rock, the physical properties of TSP-3A and TSP-3B are assumed to be similar. The results of the testing indicate the TSP-3A waste dump material classifies as a poorly-graded gravel with clay and sand with a plasticity index of 12. Large-scale direct shear testing indicated a friction angle of 33 degrees with significant cohesive strength at 1,150 pound per square foot (psf). These values were used together with a simplified waste rock dump cross section in the computer program SLIDE to evaluate the static and pseudostatic stability of the current slope configurations against failure. Seismic loading parameters were obtained from the USGS website (http://gldims.cr.usgs.gov/website/nshmp2008/viewer.htm) using the latitude and longitude of the site for a 10% probability of exceedance in 50 years. The results of the stability analyses indicate the waste rock dump material is stable in its current configuration with static and pseudostatic factors of safety in excess of 2.0. The results of laboratory testing and slope stability analyses are provided in Appendix E.

TSP-4

Sulfides do not appear to have been exposed in the TSP-4 Pit, which is more of a sidehill cut and free-draining. Fencing was not installed along the TSP-4 pit highwalls due to the proximity of the pit to the perimeter property fence and the very steep slopes upgradient of the pit limiting access to the highwall crest.

The TSP-4 dump surface and slopes support heavy vegetation and from the 1999 field study, all of the samples exhibited paste pH values between 7.02 and 8.55 s.u. The sideslopes of TSP-4 waste rock dump are generally angle-of-repose. A small failure is apparent in the northwest area of the dump and indicates movement of the dump has occurred despite the significant vegetation and effective stormwater controls that route surface water around the dump and along the haul road.

In order to evaluate the stability of the waste rock dump in its current configuration, SRK collected bulk samples of TSP-4 waste rock during the 2010 field investigation and submitted them to Vector Engineering's geotechnical testing laboratory in Grass Valley California for grain size distribution, Atterberg limits and large-scale direct shear testing. The results of the testing indicate the TSP-4 waste dump material classifies as a clayey gravel with sand with a plasticity index of 22. Large-scale direct shear testing indicated a friction angle of 33 degrees with significant cohesive strength at 1,250 pound per square foot (psf). These values were used together with a simplified waste rock dump cross section in the computer program SLIDE to evaluate the static and pseudostatic stability of the current slope configuration against failure. Seismic loading parameters were obtained from the USGS website

(http://gldims.cr.usgs.gov/website/nshmp2008/viewer.htm) using the latitude and longitude of the site for a 10% probability of exceedance in 50 years. The results of the stability analyses indicate the waste rock dump material is stable in its current configuration with static and pseudostatic factors of safety in excess of 2.0. While it is possible that unidentified foundation conditions may have contributed to the existing failure, the potential consequences of continued failure of the 36-foot-high waste dump slope are negligible under current conditions and further study is unwarranted. The results of laboratory testing and slope stability analyses are provided in Appendix E.

TSP-5

Sulfides were not exposed in the TSP-5 pit area during mining and the pit walls and waste rock consist entirely of oxide material. During SRK's 1999 inspection there was a small stormwater pond at the bottom of the pit that had good water quality with a pH value of 8.32 and TDS value of 640. The pit was subsequently regraded to a free-draining condition and revegetated. A small oxide waste rock dump is located near the southern extent of the pit. Vegetation is well established. Approximately 1,290 feet of four-strand barbed-wire fence was constructed around the top of the pit highwall and is currently in very good condition. As this is not an enclosing perimeter fence, MMI would not remove this fence post closure.

TSP-6

In the TSP-6 area there are two small pits; TSP-6E and TSP-6W. In 1999, both pits had a small amount of sulfide mineralization exposed at the base of the pit and the associated waste rock dumps consisted of oxide material. The results of one sample collected from the TSP-6E dump was non-acid generating with a neutral pH and low TDS. The pits were subsequently backfilled using the nearby oxide waste rock dumps and sulfide material is no longer exposed in the area. The vegetation in the area is well-established.

TSP-7

The TSP-7 pit is a small sidehill pit with oxide material exposed in the pit walls. A small area of possible sulfide mineralization was exposed in the pit bottom as evidenced by jarosite staining and poor establishment of vegetation in the area. A small stockpile of topsoil and oxide waste that was demonstrated during the 1999 field study to have a neutral paste pH and low TDS was used to cover the exposed sulfide and create a free-draining condition in the base of the pit.

Rooster

The Rooster pit was mined in the oxide ore cap and with the exception of a small exposure of sulfide mineralization, the pit walls consist of oxide material. The haul road accessing the pit is a sidehill oxide waste rock dump with outer slopes at angle of repose. The existing reclamation cost estimate considers laying back the crest of the outer slopes by pulling them up with a trackhoe.

2.2.3 Process Ponds

There is currently one lined process pond at the mine site, the double-lined Event Pond located east of the reclaimed heap leach pad. The Event Pond was taken out of commission in 2012 and currently can only be used for the temporary storage of excess fluids, as needed. Recent plans have considered relining the pond and/or using the pond for evaporation of diverted TSP-1 Pit water to facilitate the elimination of the inventory stored in the tailings impoundment.

The Event Pond was constructed during the summer of 1989 to replace four Phase I pregnant solution ponds and collect pregnant solution from the Phase I heap leach facility. The Event Pond has top dimensions of approximately 440 feet by 200 feet, and approximate base dimensions of 365 feet by 125 feet. The pond is approximately 12.5 feet deep with 3H:1V sideslopes. The maximum storage capacity of the event pond is 5.4 million gallons, allowing for 2.0 feet of dry freeboard.

The pond liner system consists of a primary 60-mil HDPE liner and a secondary 40-mil HDPE liner encompassing a geonet for leak collection and recovery. The liner subgrade is sloped toward the northeast corner where a leak detection riser pipe is located. This pipe is plumbed into 4-inch-diameter perforated leak detection piping located in leak detection ditches that extend around the entire perimeter of the pond base.

The pond was constructed with a french drain under the secondary liner to dissipate shallow groundwater present beneath the pond and alleviate the potential for upward pressure on the liner. The liner system is underlain by a geonet strip subdrain that links into 4-inch-diameter perforated subdrain piping located vertically below the leak detection piping. The subdrain piping is extended via solid-wall piping from the topographic low point in the northeast corner of the pond to daylight to ground surface north of the pond at the French Drain Outfall (FDO). Before the Event Pond was decommissioned in 2012, collected fluid from the heap leach was recirculated back into the Event Pond. Currently, all heap flows are directed to the tailings impoundment for passive evaporation.

2.2.4 Heap Leach Pad

The existing heap leach pad was constructed in 1985. It was operated for about three years and was last under active cyanide leach in 1988. In 1991, the existing southern expansion of the heap leach pad was approved to receive ore from the Rooster Pit. In 1997, a modification was approved that allowed the construction of a bio-oxidation heap on top of the existing heap leach ore. An HDPE geomembrane liner was placed on top of the northern portion of the heap leach pad (~ 6 acres) and approximately 4,450 cubic yards of sulfide material were placed over about a third of the liner. The top of the southern portion of the pad (approximately 5.5 acres) was not covered by liner. The HLP contains approximately 900,000 tons of ore (excluding the sulfide ore on the upper liner mentioned above).

Site closure activities conducted in 2006 included: removal of the sulfide ore from the top of the pad back to the TSP-1 Pit, installing a draindown collection drain along the east side of the pad, regrading the heap top and sideslopes to shed surface runoff, installing an 18-inch-thick soil cover, and construction of a stormwater control channel. Revegetation activities were completed in late Fall 2006. Revegetation success was achieved and approved by NDEP-BMRR in correspondence dated August 25, 2009 and by BLM in correspondence dated September 24, 2009.

Residual flows from the heap leach pad are currently collected in the buried gravel drain along the eastern edge of the pad and managed either in the Event Pond or routed through the heap water conveyance pipeline to the tailings impoundment, which is further discussed in the Fluid Management System section below.

The flows continue to be influenced by seasonal variations in precipitation, though as vegetation has become increasingly established from year to year, the influence of the spring snowmelt on the flow rate has diminished and flows reach a baseline flow rate of less than 1 gpm during summer and fall.

2.2.5 Tailings Storage Facility

The TSF was constructed as a zero-discharge facility in December 1988 and contains an estimated 40,000 tons of tailings. The total disturbed area covers approximately 16.6 acres and includes the embankment, tailings beach, pool, and grubbed area around the impoundment perimeter (**Figure 4**). The initial phase of the embankment was constructed to a crest elevation of 6635 feet above mean sea level (amsl) and is the only portion of embankment that was constructed. The embankment was designed with a final crest elevation of 6691 feet amsl.

Seepage under the deposited tailings and seasonal pool is collected in the impoundment's under-drain system, a series of 6-inch diameter perforated pipes placed approximately 2 feet below ground surface

in drain sand and connecting via gravity flow to a central 6-inch pipe that conveys flows to the TSCT, located approximately 900 feet east of the embankment. A second 6-inch-diameter perforated drain pipe, which has previously been referred to as the toe drain, is located directly under the embankment in the embankment key trench and is designed to collect shallow perched groundwater and seepage from the impoundment. The outlet from this drain also flows via gravity to the tailings seepage collection tank.

The TSF is currently an integral part of the mine's fluid management system, and is used to store and evaporate pH-adjusted TSP-1 water via the interim fluid management system, although the majority of the fluid within the impoundment is captured meteoric water. The tailings impoundment pond is currently undergoing active evaporation in the warmer months with one SMI Super PoleCat snowmaker/evaporator and two large Rainbird-style impact head sprinklers. This active evaporation will be discontinued with implementation of the Proposed Action.

2.2.6 Waste Rock Dumps and Solid Waste Landfill

The Mine Plan Area contains several existing waste rock disposal areas associated with the TSP-1, TSP-3A, TSP-3B, TSP-4, TSP-5 and Rooster pits. With the exception of TSP-1, these facilities have either been recontoured and reclaimed or have naturally revegetated such that additional regrading or reclamation is not proposed. Note that waste rock disposal areas have yet to be evaluated for revegetation release. It is currently proposed that waste rock dump TSP-1 and the adjacent sulfide-bearing portion of the haul road (estimated at approximately 5,000 cubic yards) would be utilized for construction of the tailings disposal cell and as backfill in TSP-1 pit to achieve a positive draining configuration.

The existing Class III solid waste landfill is located just north of the Event Pond and has been used in ongoing reclamation and closure activities. The location of the landfill is shown on **Figure 4**. This landfill, or the closest licensed facility, will continue to be used for on-site disposal of non-hazardous construction and demolition waste generated during closure activities. Final closure of the facility will include regrading to drain surface water runoff and covering with 24 inches of compacted growth media.

2.2.7 Storage and Equipment Areas

This category includes ore stockpiles, growth media stockpiles, diversion channels, the equipment yard, and the temporary housing area (THA). There are four ore stockpiles located near the TSP-1 open pit and 13 growth media stockpiles throughout the site that are designated for use in reclamation activities. The system of drainage diversion channels are part of the mine's stormwater management system and will remain in place following closure construction and reclamation.

The THA is located approximately 2 miles east of the Mine Plan Area. The THA originally consisted of a Man Camp together with the RV loop dating back to the 1980s. The RV loop was designed with 40 spaces for mobile, temporary, trailers. The Man Camp was previously closed and reclaimed. The RV loop is currently in use and includes associated water, electricity and sewage improvements. The equipment yard and THA are currently used for both exploration activities and closure and reclamation activities, but will be closed and reclaimed as part of final site closure.

2.2.8 Monitoring and Production Wells

All exploration drill holes (i.e., boreholes) and installed monitoring or production wells not proposed for use in post-closure monitoring will be abandoned in accordance with Nevada Division of Water Resources regulations under NAC Sections 534.425 through 534.428. Current and proposed post-closure compliance monitoring wells include GWM-1, GWM-1a, GWM-2, GWM-3 and GWM-4. **Table 2-6** presents a list of exploration, monitoring and production wells previously included in the

Revised Reclamation Cost Estimate, Three-Year Update (TSLLC, 2011). Wells within the TSP-1 Pit perimeter were closed as part of the program to close open boreholes. The remaining wells, other than those proposed for post-closure monitoring, will be closed as part of site closure and reclamation. The locations of existing open wells are shown on figures 2, 3, 4 and 5.

Table 2-6: Summary of Site Wells

Well Description				
1	199001-I	CLOSED (within TSP-1 Pit boundary)		
2	199001-II	CLOSED (within TSP-1 Pit boundary)		
3	199002-I	CLOSED (within TSP-1 Pit boundary)		
4	199002-II	CLOSED (within TSP-1 Pit boundary)		
5	199003-I	CLOSED (within TSP-1 Pit boundary)		
6	199004-II	CLOSED (within TSP-1 Pit boundary)		
7	GWM-1 (199005-I)	4	105	50
8	GWM-1a (199005-II)	2	32	10
9	199008-I	CLOSED (within TSP-1 Pit boundary)		
10	199008-II	CLOSED (within TSP-1 Pit boundary)		
11	BSMW-1	4	45	10
12	BSMW-2	4	45	10
13	BSMW-3	4	60	10
14	GWM-4 (BSMW-4)	2	45	10
15	GWM-3 (LPE-03-TH1)	2	110	10
16	TSP-1-03-TH7	2	225	10
17	GWM-2 (TSP-1-03-TH8)	4	125	75
18	TS06R-35	2	300	90
19	TS06R-36	2	100	50
20	Man Camp Well (production) (Well 6)	8	300	50
21	Mine Well (production) (Well 5)	16	660	100

2.2.9 Structures and Building Areas

This category includes areas that are occupied by buildings and structures, such as the administration area, laboratory, processing area, warehouse area, and the truck shop area along with other miscellaneous areas. The administration area, laboratory, warehouse area, and the truck shop area are currently being used to support both exploration activities and the closure and monitoring activities.

2.3 Existing Fluid Management System

The existing fluid management system provides for active management of seepage from the impoundment underdrain and toe drain systems at the TSF, draindown from the heap leach pad, and seepage and surface water collecting in the TSP-1 Pit and sump. The current fluid management system was constructed in 2006 and early 2007 in accordance with the 2005 Notice of Alleged Violation (NOAV) and Order agreement with the NDEP-BMRR.

2.3.1 Tailings Seepage Management

The existing tailings seepage collection tank was installed in accordance with the 2005 NOAV and Order and is effectively an engineered version of the previous system without the pond. The existing TSCT is comprised of a plastic inner tank that is six feet in diameter, 6.3 feet high, with a volume of 1,550 gallons. The inner tank is set within a concrete outer tank (a precast concrete manhole riser) that provides secondary containment for the inner tank. The outer tank is 7.1 feet in diameter, 6.7 feet high, with a volume of 2,070 gallons, and provides more than 110 percent capacity of the inner tank. Seepage collected in the TSCT is automatically pumped back to the TSF through a 3-inch HDPE pipe. The pump is operated by a level-actuated switch within the inner tank. During excavation for the installation of the existing tank system, what was believed at the time to be the tailings embankment toe drain pipeline was encountered and combined with the impoundment underdrain pipeline flows through the installation of a pipeline wye prior to discharge into the existing TSCT. It is currently believed that the pipeline is actually the embankment underdrain constructed within the key trench to maintain the local groundwater level below the base of the embankment (based on design drawings in Welsh, 1988).

Once the existing system was installed, the tailings seepage collection pond was closed by removing the existing liner and piping systems, backfilling the pond, and regrading to promote surface drainage away from the area. The final closed surface was then revegetated with a BLM-approved seed mix (**Table 2-7**), and the two drainage diversion channels were installed to route stormwater flows from the upgradient watershed around the tank system and closed pond.

2.3.2 Heap Draindown Management

Heap draindown management prior to the installation of the existing system in 2006 included collection of draindown within the Event Pond and periodic pumping (as necessary to maintain a manageable pond inventory) via above-ground piping to the tailings impoundment. In response to the requirements of the 2005 NOAV and Order, TSLLC constructed a passive draindown collection and conveyance system to facilitate management of draindown flows either in the Event Pond or the tailings impoundment.

There were two distinct sources of flow from the heap leach pad: 1) draindown flowing over the heap liner and through two channels between the heap and event pond; and 2) leakage collected in the leach pad draindown channel leak detection system pipe at monitoring points HLPLDP-3 and HLPLDP-4.

As a result of the heap closure construction completed in 2006, draindown is now collected in a perimeter gravel drain and pipe constructed along the eastern edge of the pad, the end of which daylights in the open channels between the heap and Event Pond. To ensure the collection of all draindown flows within the perimeter channel, an HDPE liner flap was welded to the existing channel base to ensure full containment of heap fluids and a small berm was added in the channels downstream of the welded flap to force flows into drop inlets installed in the heap water conveyance pipeline. If for some reason the pipeline were to clog, the flows would simply overflow into the event pond via the same channel.

The drop inlets are essentially screened pipe inlets into the four-inch diameter SDR17 HDPE heap water conveyance pipeline. The pipeline extends from the open channels between the heap and Event Pond to an intersection south of the Event Pond with the TSP-1 Pit water conveyance pipeline in a distribution box inside a buried vault (refer to **Figure 4** of this document or **Figure 3.1** in the FPPC in Attachment 1 of the APO). Flow rate monitoring is accomplished where the flow drops into the distribution box. Flows from the leak detection pipes under the existing heap draindown collection channel (HLPLDP-3 and HLPLDP-4) are automatically pumped via a level-actuated pump into the channels between the heap and pond and enter the conveyance pipeline via the drop inlets. The heap

water conveyance and transfer pipeline was constructed within an eight-inch diameter pressure-rated corrugated polyethylene (CPE) pipeline for leak detection.

Once the heap water management system was completed, TSLLC regraded the leach pad to promote run-off, and covered the entire pad with a minimum of 18 inches of growth media. The final covered surface was then revegetated with a BLM-approved seed mix (**Table 2-7**). Heap draindown flows are currently directed to the tailings impoundment for passive evaporation.

2.3.3 TSP-1 Pit Water Management

TSP-1 Pit water management prior to the implementation in 2007 of the current in-line pH adjustment system included periodic pumping of sump water to the stainless steel mill tanks via a 3-inch diameter pipe within a 10-inch HDPE pipeline, pH adjustment in an interim mixing tank with slaked lime, and ultimate discharge via above-ground piping into the tailings impoundment. The system was difficult to maintain and susceptible to freezing conditions common at the site during the winter months. In response to the requirements of the NOAV and Order, TSLLC designed and constructed an interim water management system that is effectively a more efficient and reliable version of the previous TSP-1 Pit water management system.

During late 2006 and early 2007, TSLLC constructed a four-inch diameter SDR 17 HDPE pit water conveyance pipeline from the TSP-1 sump through an in-line pH adjustment system and to the tailings impoundment. The water conveyance pipeline is buried at a minimum depth of three feet below existing ground surface for protection against freezing. In accordance with leak detection requirements of NAC 445A.436 and following discussions with BLM and NDEP-BMRR, the pipeline was installed within a second 8-inch diameter pressure-rated CPE (ADS® N-12) over the entire length of the pipeline. The pipeline exits the sump area at an elevation below the base of the sump trench and drains via gravity all the way to the tailings impoundment to ensure that the pit is maintained in a constant state of drawdown (refer to **Figure 4** in this document or **Figure 3.1** in the FPPC in Attachment 1 of the APO).

TSP-1 Pit water, prior to mixing with the heap flows and then discharging into the tailings impoundment, is routed via the conveyance pipeline through an in-line pH-adjustment system located within a buried, 8-foot by 10-foot precast concrete vault (from Jensen Precast) with a custom-fabricated, insulated and sealed, lightweight aluminum access door. The pH neutralization system is a skid-mounted unit manufactured by American LEWA, Inc. in Massachusetts. The system incorporates a LEWA caustic supply pump controlled by a flow meter and pH meter. Two pump controllers use measurements from both meters to adjust pump speed and stroke length to control caustic addition for a range of incoming flow rates from no flow to 52 gallons per minute. Caustic is added upstream from the flow meter and pH meter. Caustic and TSP-1 water flow through a Kenics in-line static mixer and then past the flow and pH meters. Flow rate and pH are recorded on a data logger – data can be downloaded directly from the data logger to a laptop computer or by changing out a secure digital memory storage card.

The original system design presented in the engineering design report (EDR) used the vault as secondary containment and leak detection for the TSP-1 Pit water conveyance pipeline. To protect the electronic equipment of the neutralization system in case of a leak in the upstream conveyance pipeline, two Jensen Precast D30 commercial distribution boxes were installed on either end of the vault (connected to the 8-inch diameter CPE leak detection pipe both upstream and downstream from the vault) and the secondary containment was routed between the distribution boxes through a 4-inch diameter HDPE pipe around the northern edge of the vault between the vault and the concrete foundation for the caustic supply tank. The result of the minor design change is protection of the pH adjustment equipment and the formation of a continuous leak detection system that bypasses the vault.

The pH adjustment system vault was further modified during construction with the following:

- a level-actuated electric pump that in upset conditions would pump water from the floor of the vault into the downstream distribution box (i.e., secondary containment) – actuation of the pump also trips a red strobe light at the top of the surface electrical panel skid (approximately 8 feet off the ground) to alert mine staff of a problem;
- a baseboard-style electric heater to prevent freezing and minimize the potential for condensation inside the vault;
- two vents with motion-activated electric fans, one pulling fresh air from outside into the vault and the other pulling vault air out; and
- sensors in the pH neutralization skid construction that detect either diaphragm problems with the pump or an absence of caustic in the supply line and:
    1. trip a warning light on the control panel;
    2. trip the automatic shut-off valve in the downstream distribution box to prevent untreated water from discharging to the impoundment; and
    3. trip a red strobe light at the top of the surface electrical panel skid (approximately 8 feet off the ground) to alert mine staff of a problem.

The existing system provides a quasi-passive version of the previous management system (i.e. gravity flow instead of pumping and caustic injection instead of lime slaking and mixing), provides for year-round operation in the buried conveyance pipeline and pH adjustment system, and ensures the sump is maintained in a constant state of drawdown to facilitate borehole and pit closure.

2.3.4 Fluid Evaporation in Tailings Impoundment

TSP-1 Pit water, heap leach pad draindown, and seepage returned to the tailings impoundment via the TSCT are actively evaporated in the tailings impoundment during the warmer spring and summer months using one SMI Super PoleCat snowmaker/evaporator and two Rainbird-style sprinklers. During recent summer evaporation seasons, TSLLC reduced the depth of the free water pool such that pumping was no longer possible. It is estimated that 5 to 10 million gallons have been evaporated from the tailings impoundment annually over the past five years.

2.3.5 Approved Fluid Management System Modifications

In 2009, TSLLC proposed several modifications to the existing fluid management system, which were approved by NDEP-BMRR and the BLM, but which have not yet been implemented. TSLLC proposed to continue to route TSP-1 Pit water through the existing pH-adjustment system, but rather than continue to discharge in the tailings impoundment, TSLLC proposed to construct a diversion pipeline from the existing TSP-1 Pit water conveyance pipeline (which currently flows to the tailing impoundment) to the Event Pond. The existing valves in the heap leach draindown conveyance pipeline between the heap and the Event Pond would then be closed such that all heap leach pad draindown water would report to the Event Pond. The inflows would be actively evaporated within the Event Pond using the existing floating system of sprayers. TSLLC does not currently anticipate constructing these modifications, but rather proposes to construct a new pond for interim and post-closure fluid management, as described in the Proposed Action in Section 2.1.

2.4 Reclamation

No new disturbance would be associated with the Proposed Action. Upon final closure all buildings and processing facilities would be removed, and the TSP-1 pit would be partially backfilled. All existing disturbance including roads, storage and equipment yards, inter-facility areas, waste rock disposal areas, the heap leach pad, man camp, RV loop, and Class III solid waste landfill would be

regraded, ripped, covered with salvaged growth media, and revegetated with the BLM-approved, noxious weed free certified seed mix provided in **Table 2-7**. Prior to regrading and revegetation, the tailings impoundment would be covered with a minimum of 18 inches of soil and the event pond would be pumped dry, backfilled, and covered with a 12-inch thick layer of growth media.

Table 2-7: BLM Approved Certified Noxious Weed Free Seed Mix

Plant Code	Common Name	Seeding rate (lbs./pure live seed (PLS)/acre
ACMI	Western Yarrow	0.25 lbs./PLS/acre
SPHAE	Scarlet Globemallow	0.25 lbs./PLS/acre
ARTRT	Basin Big Sagebrush	4 lbs./PLS/acre
PSSPS	Bluebunch Wheatgrass	3 lbs./PLS/acre
ACTH7	Thurbers Needlegrass	3 lbs./PLS/acre

Source: Seed mix prescribed by Ashley Johnson at the BLM Mount Lewis Field Office through e-mail correspondence from Andrea Dolbear at the BLM Battle Mountain District Office on June 20, 2013 (BLM 2013a).

All reclamation activities would be done in accordance with the Tonkin Springs Mine APO #NVN-067881 and Reclamation Permit (No. 0166), and to the standards described in 43 CFR § 3809.420.

2.5 Environmental Protection Measures

As part of the Proposed Action, TSLLC continues to commit to the following Environmental Protection Measures and Best Management Practices (BMPs) to prevent unnecessary and undue degradation during the closure activities at the site. The measures are derived from the general requirements established in the BLM's Surface Management Regulations at 43 CFR § 3809 and NDEP-BMRR mining reclamation regulations, as well as other water regulations and BLM protocols.

2.5.1 Air Quality

- The dust from the use of roads and excavation activities would be minimized to the extent acceptable by the Authorized Officer (AO) by using BMPs such as minimizing vehicular traffic, using prudent vehicle speeds (i.e., 15 to 25 miles per hour), and watering to minimize fugitive dust. Water used for dust control would be obtained from an existing well.

2.5.2 Hazardous or Solid Wastes

- Pursuant to 43 CFR § 8365.1-1(b)(3), no sewage, petroleum products, or refuse would be dumped from any trailer or vehicle.
- Regulated wastes would be removed from the Mine Plan Area and disposed of in a state, federally, or locally designated area.
- All refuse generated during the Project would be removed and disposed of in the existing Class III landfill or the nearest licensed facility, consistent with applicable regulations. No refuse would be disposed of or left on site.
- Spills or releases will be managed using source control including up-righting tipped containers, shutting off valves, turning off pumps, and plugging holes in containments where the pressure and flow is low, and flow diversion. Earth-moving equipment will be mobilized to construct berms to contain releases and once contained, all impacted soils will be excavated and properly disposed of in a suitable location. Other temporary emergency containment or diversion methods include straw bales and booms, absorbent pads, diversion ditches and liners. Depending upon the magnitude ad type of release, notification to one or all of the following agencies is required: Nevada Division of Environmental Protection, Nevada

Division of Emergency Management and/or National response Center. It is the responsibility of TSLLC to make appropriate notifications.

2.5.3 Water Quality

- Sediment control structures could include, but not be limited to, fabric and/or hay bale (certified weed-free) filter fences, or filter berms, mud pits, and downgradient drainage channels in order to prevent unnecessary or undue degradation to the environment.
- TSLLC will conduct closure operations so as to minimize soil erosion. Equipment will not be operated when ground conditions are such that excessive rutting or increased sediment transport will occur. Best Management Practices (BMPs) will be utilized to control erosion and sedimentation. BMPs for sediment control will be employed during construction, operation, and reclamation to minimize sedimentation of disturbed areas. Sediment control structures may include, but not be limited to, fabric and/or certified weed free straw bale filter fences, siltation or filter berms, mud sumps, and downgradient drainage channels in order to prevent unnecessary or undue degradation to the environment. In order to control erosion from roads and construction sites, and from the unlikely event of excavation cuttings being released, certified weed-free straw bales and silt fences will be placed in drainages to capture sediment, where required.

2.5.4 Public Safety

- Public safety would be maintained throughout the life of the Project. All equipment and other facilities would be maintained in a safe and orderly manner.
- All Project-related traffic would observe prudent speed limits to enhance public safety, protect wildlife and livestock, and minimize dust emissions. All activities would be conducted in conformance with applicable federal and state health and safety requirements.
- Survey monuments, witness corners, and/or reference monuments will be protected to the extent economically and technically feasible. Should moving such a feature be required, TSLLC will ensure that a licensed Professional Land Surveyor oversees and executes the relocation in a manner consistent with applicable laws. The BLM will be notified in writing prior to the moving of any such survey monument.
- TSLLC would protect fences, gates, stock ponds, and other range improvements within the Project Area. Gates would be closed and/or locked as appropriate.

2.5.5 Fire Management

The following precautionary measures would be taken to prevent wildland fires.

- All equipment would be properly muffled and equipped with suitable and necessary fire suppression equipment, such as fire extinguishers and hand tools.
- Adequate fire-fighting equipment (i.e. shovel, pulaski, extinguishers), and/or an ample water supply would be kept at the drill site(s).
- Vehicle catalytic converters would be inspected often and cleaned of all brush and grass debris.
- When conducting welding operations, the operations would be conducted in an area free from, or mostly free from, vegetation. An ample water supply and shovel would be on hand to extinguish any fires created from the sparks. Extra personnel would also be at the welding site to watch out for fires created by welding sparks.

- Wildland fires would be reported immediately to the BLM Central Nevada Interagency Dispatch Center at (775) 623-3444.
- When conducting operations during the months of May through September, TSLLC would contact the Battle Mountain District (BMD), Division of Fire and Aviation to determine if any fire restrictions are in place for the area of operation and to advise the BLM of approximate beginning and ending dates for the activities.

2.5.6 Noxious Weeds, Invasive & Non-native Species

In response to the noxious weed problem, there have been enacted Federal and State laws, executive orders, regulations, policies, and agreements that pertain to invasive non-native species, including:

- The Federal Insecticide, Fungicide and Rodenticide Act (1972);
- The Federal Noxious Weed Act (1974);
- Federal Land Policy Management Act (FLPMA) (1976);
- The Public Rangelands Improvement Act (1978);
- Chapter 555 of the Nevada Revised Statues and Nevada Administrative Code;
- Executive Order 13112 (Prevention and Control of Invasive Species);
- BLM Manual 9015 – Integrated Weed Management;
- BLM Manual 9011 – Chemical Pest Control;
- BLM Action Plan – Partners Against Weeds; and
- BLM cooperative agreements.

The strategy for noxious weed management is to, "prevent and control the spread of noxious weeds through local and regional cooperative efforts…to ensure maintenance and restoration of healthy ecosystems on BMD-managed lands." In addition, noxious weed control would be based on a program of "prevention, education, early detection and rapid response (control) of small infestations."

The BLM has developed an Integrated Weed Management (IWM) Program for the BMD. In accordance with this IWM Program, the following precautionary measures would be taken to prevent the spread of noxious weeds:

- Noxious weeds would be controlled by washing vehicles and equipment that come from outside of northern Nevada with high-pressure sprayers prior to mobilizing to the Mine Plan Area. Vehicle washing would be performed in Elko or Eureka, Nevada.
- On-site personnel would be provided with Nevada Department of Agriculture (NDOA) and University of Nevada Cooperative Extension (UNCE) weed identification information.
- Roads within the Mine Plan Area would be reseeded with a BLM approved certified weed free seed mix (**Table 2-7**, Section 2.4). Reseeding would be consistent with all BLM recommendations for mix constituents, application rates, seeding methods, and seeding periods.
- If noxious weeds were introduced as a result of the Proposed Action, eradication measures would be done in a manner as to avoid impacts to wildlife species. If herbicides are necessary, herbicide use would be timed to take place during the appropriate growth cycle of the targeted noxious weed, and herbicides would be applied strictly in accordance with the manufacturer's specifications.

2.5.7 Wild Horses

- No activities would block access to water by wild horses.

- Any conflicts or concerns about wild horses in the Mine Plan Area would be forwarded to the Field Office Wild Horse Specialist immediately.

2.5.8 Cultural Resources

- All activities would avoid known cultural resources.
- Avoidance is the TSLLC-preferred treatment for preventing effects to historic properties (an historic property is any prehistoric or historic cultural site eligible for nomination to the National Register of Historic Places (NRHP)) or an unevaluated cultural resource. TSLLC will use the results of the Class III cultural resources surveys to ensure that sites eligible or unevaluated for the NRHP are appropriately avoided. Avoidance areas will be staked and/or flagged with an approximately 30-meter buffer, as needed and, if necessary, a monitor will be provided during implementation. If cultural resources not previously identified are encountered, TSLLC would immediately cease activities within 300 feet of the discovery, ensure the discovery is appropriately protected, and immediately notify the Mount Lewis Field Manager by telephone, followed by written confirmation. Work would not resume, and the discovery would be protected until the BLM Authorized Officer issues a notice to proceed.
- The Archaeological Resources Protection Act (ARPA) codified at 43 CFR § 7, as well as the Native American Graves Protection and Repatriation Act (NAGPRA), codified at 43 CFR § 10, both provide protection for historic properties, cultural resources, and Native American funerary items and/or physical remains located on federal land. In addition, ARPA provides for the assessment of criminal and/or civil penalties for damaging cultural resources. Any unplanned discovery of cultural resources, human remains, items of cultural patrimony, sacred objects, or funerary items, requires that all activity in the vicinity of the find ceases, and notification be made to the Authorized Officer, Mount Lewis Field Office, 50 Bastian Road, Battle Mountain, NV, 89820 (775 – 635 – 4000), by telephone, with written confirmation to follow, immediately upon such discovery. Adequate steps will be taken to ensure protection, and secure the discovery in place until a Notice to Proceed is issued.

2.5.9 Wildlife (including migratory birds and special status species)

- Land clearing and surface disturbance would be timed to prevent destruction or disturbance of active bird nests or birds during the avian breeding season (March 1 through July 31 for raptors, and April 1 through July 31 for other avian species). If project activities are unavoidable during this period, clearance surveys for nesting birds and raptors would need to be completed by a qualified wildlife biologist prior to conducting project activities. Clearance surveys would include an appropriate buffer zone determined by a BLM wildlife biologist. All nesting bird surveys are valid for 14 days; if project activities do not begin before the surveys expire, then the surveys must be performed again. If active nests are located, or if other evidence of nesting (i.e., mated pairs, territorial defense, carrying nest material, transporting food) is observed, a protective buffer (the size depending on the habitat requirements of the species) would be delineated during consultation with the BLM resource specialist. The site characteristics to be used to determine the size of the buffer area are as follows: 1) topographic screening; b) distance from disturbance to nest; c) the size and quality of foraging habitat surrounding the nest; d) sensitivity of the species to nest disturbances; and e) the protection status of the species. The buffer area would be avoided to prevent destruction or disturbance of nests or birds until they are no longer actively breeding or rearing young. Seasonal disturbance restrictions surrounding occupied nests would remain in place until the young have fledged or the nest fails. After July 31, no further avian surveys would be required until the next avian breeding season.

- One active Greater sage-grouse lek is located approximately 3.6 miles southwest of proposed project activities. Project activities will take place outside of the Greater sage-grouse lekking season (March 1-May 15) where possible. If project activities must occur during the lekking season, a BLM wildlife biologist will be consulted and mitigation measures such as timing and noise restrictions may be placed on activities within four miles of the lek.
- Ravens are greater sage-grouse nest predators and can be attracted to areas with anthropogenic disturbance. In order to avoid an increase in raven presence around the site, good housekeeping practices will be implemented. All trash will be placed in secure containers and removed from the site at the end of each workday. Additionally, road-killed wildlife detected along access roads will be promptly removed to avoid encouraging raven presence.
- Off-site mitigation for surface disturbance in habitat identified as Preliminary Priority Habitat (PPH) or Preliminary General Habitat (PGH) may be required at a mitigated-area-to-disturbed-area ratio of 2:1 for PGH and 3:1 for PPH. However, this project serves to reclaim disturbed acreage that was the result of a previously approved project for which no off-site mitigation for greater sage-grouse habitat was required. Additionally, a Memorandum of Understanding entitled, "Regarding the Establishment of a Partnership for the Conservation and Protection of the Greater Sage-Grouse and Greater Sage-Grouse Habitat" was established in 2013 between the BLM, the United States Forest Service- Humboldt-Toiyabe National Forest, the Nevada Department of Conservation and Natural Resources, and mining companies that are members of the Nevada Mining Association. Section II.E.v.b reads, "Site reclamation plans may include specific measures designed to provide for restoration/rehabilitation or improvement of sage-grouse habitat during the reclamation process. Where such reclamation is found to adequately address some or all of the impacts on greater sage-grouse, the required mitigation or offsetting may be reduced or eliminated." (p.4). The proposed project activities would involve reclamation and restoration of approximately 482 disturbed acres back to sagebrush habitat in greater sage-grouse PPH, thereby resulting in a net conservation gain for greater-sage grouse habitat.

2.6 NDOW identified a golden eagle nest within ten miles of the project area (NDOW 2013). Land clearing or other surface disturbance associated with the activities within the Project Area will be conducted outside of the raptor nesting season, whenever feasible, to avoid potential destruction or disturbance of nesting raptors at known nests. If surface disturbance occurs during the raptor nesting season (March 1 – July 31), a qualified wildlife biologist will perform a survey for raptor nests within 0.25 mile of the project boundary. The survey may be an aerial or ground survey and may be performed more than once, at the discretion of the BLM wildlife biologist. If active raptor nests are discovered, a protective buffer will be placed around the nest, wherein no surface disturbing activities will occur during the nesting season. The size of the buffer will be determined by a BLM wildlife biologist and will follow standard guidelines of 0.5

mile for golden eagle and goshawk nests and 0.25 mile for other raptor species.Alternatives to the Proposed Action

No alternatives other than the "No Action Alternative" are analyzed in this EA as there are no unresolved conflicts.

2.6.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be approved by the BLM and reclamation of the site would proceed in accordance with the Tonkin Springs Mine APO #NVN-067881, Reclamation Permit (No. 0166), and descriptions provided in the Revised Reclamation Cost Estimate Three Year Update (submitted and accepted by the BLM in February 2011), for all of the facilities (including those addressed by the Proposed Action). To that end, TSLLC would employ the following reclamation approaches for the facilities identified in the No Action Alternative:

- **Tailings Storage Facility:** Once all of the surface waters reporting to the TSF have been eliminated (rerouted) and evaporation has dried the tailings surface, the existing tailings material would be pushed toward the north and south from the center of the existing stockpile in preparation for the construction of a drainage channel. A drainage channel would be constructed through the middle of the tailings facility to reestablish the natural drainage channel. As part of the channel construction, the tailings embankment would be excavated and this material would be utilized as cover for the relocated tailings materials. The excavated channel would then be lined with riprap. The tailings and beach area would be covered with approximately 18 inches of cover material excavated from the embankment and salvaged growth media during the construction of the channel.

  During final active evaporation of the tailings pond, fluid from the tailings seepage collection tank would be pumped back into the tailings pond as it is collected. Once the inventory in the tailings facility is evaporated, fluids from the TSCT will be pumped to the expanded (existing) evaporation pond for a period of approximately five years. At the end of this period, when the TSCT is no longer necessary to contain TSF draindown, it would be reclaimed in place. Reclamation would consist of perforating the tank, which is currently buried, to allow free drainage of meteoric waters and then backfilling in place. Underground piping would be capped and left in place.
- **TSP-1 Pit:** Reclamation of the TSP-1 open pit would be implemented in accordance with the approved Engineering Design Report for Closure of the TSP-1 Pit (SRK, 2006) and would include a minimum of one year of flow and chemistry monitoring; regrading pit surfaces using existing material from the ore stockpiles located to the southwest of the open pit, as well as some material from the TSP-1 waste dump to create a pit surface configuration that promotes surface water drainage across the pit; and then covering the final regraded surfaces of the pit with a minimum of 18 inches of salvaged growth media from existing topsoil stockpiles; and construction of a riprap-lined central drainage swale through the regraded and covered upper bench.
- **Sulfide Ore Stockpiles:** The four ore stockpiles located to the southeast of the TSP-1 would be utilized for regrade material during reclamation of the TSP-1 Pit. It is anticipated that all of the material in the stockpiles will be utilized during the TSP-1 open pit reclamation. Through previous investigation of the ore stockpiles, it is known that a small amount of sulfide material is contained within the ore. Sulfide material will be identified prior to regrading activities and placed in the middle and upper benches of the open pit. Once all of the material is removed, the disturbance footprint will be ripped and reseeded.
- **Existing Event Pond:** Under the No Action Alternative, the existing event pond would be modified to function as an evaporation pond for long-term fluid management. The TSP-1

water and heap leach pad draindown, which are currently piped to, and managed in, the TSF, would be rerouted to the modified (expanded) Event Pond for passive evaporation. The fluids would be redirected to the Event Pond upon completion of the TSP-1 reclamation work and prior to the reclamation work at the TSF.

The expanded evaporation pond would incorporate an area of approximately 5.2 acres. The existing pond footprint would be expanded, but only constructed to a depth of 42 inches with 3H:1V side slopes and would accommodate 18 inches of storage with two feet of freeboard. The existing pond liners would be cut and folded in place; the french drain piping system would be removed; and, the existing pond would then be backfilled to the stated depth of 42 inches with material from the TSP-1 waste rock dump and material from the excavation of the expanded pond area. The expanded pond area would be lined with approximately 12 inches of compacted low-permeability soil from topsoil stockpiles. Material would have a permeability of 1×10^{-6} centimeters per second or less. The event pond would then be single lined with 80-mil high density polyethylene (HDPE).

3.0 Affected Environment and Environmental Effects

3.1 Critical Elements of the Human Environment

This section describes the current status of critical elements and resources that may be affected by either the Proposed Action or No Action Alternative and analyzes the potential environmental effects of the Proposed Action and the No Action Alternative. Data concerning existing (i.e., baseline) conditions and resource trends were obtained from: previous studies; published sources; unpublished materials; interviews with representatives of local, state, and federal agencies; and/or field observations of the Mine Plan Area.

To comply with NEPA, the BLM mandates that all environmental assessments address specific critical elements of the environment that are subject to requirements specified in statute, regulation, or by Executive Order (EO) (BLM, 1988; BLM, 1997; EO13186; EO12898). **Table 3-1** outlines the critical elements that must be addressed in all environmental assessments and whether or not the Proposed Action potentially impacts those elements.

Table 3-1: Critical Elements of the Human Environment Addressed for the Proposed Project*

Critical Element	Not Present	Present, But Not Affected	Present and Potentially Affected	Rationale for Inclusion or Exclusion
Air Quality			●	The Proposed Action could generate fugitive dust during relocation and covering of the tailing, TSP-1 dump, and ore stockpiles.
Areas of Critical Environmental Concern (ACEC)	●			No ACECs occur in or near the Mine Plan Area
Cultural Resources			●	Although all activities are on previously disturbed ground, previously unidentified (and unevaluated) cultural resources could be encountered. Known cultural resources exist in the vicinity of Proposed Action. Eligible or unevaluated cultural resources could be affected by the Proposed Action.
Environmental Justice	●			No minority or low-income groups would be affected by disproportionately high and adverse health or environmental effects.
Farm Lands (prime or unique)	●			No prime or unique farmlands are located in the BMD office by definition.
Fire Management			●	The Mine Plan Area is within a fire management unit. Fire management could be affected by the Proposed Action.
Floodplains	●			No 100-year floodplains occur in or near the Mine Plan Area.
Geology and Minerals			●	The backfilling of TSP-1 Pit may hinder future access to known mineral resources
Grazing Management			●	Grazing movement may be increased if the decision to remove the existing 4-strand, barbed-wire perimeter fence is made after reclamation standards have been met.
Human Health and Safety	●			This element is not present within the Mine Plan Area.

Critical Element	Not Present	Present, But Not Affected	Present and Potentially Affected	Rationale for Inclusion or Exclusion
Noxious Weeds, Invasive & Non-native Species			●	Disturbance of soil during construction could allow establishment of noxious weeds and other invasive, non-native species.
Migratory Birds			●	Migratory birds utilize the Mine Plan Area.
Native American Religious Concerns			●	Although all activities are on previously disturbed ground, Native American Religious Concerns could be affected by the Proposed Action.
Paleontological Resources		●		Paleontological resources may occur in the Mine Plan Area. The Proposed Action would not create any additional disturbance, so impacts to paleontological resources are not anticipated.
Recreation		●		The Mine Plan Area may be used for recreation. Recreation in the area is minimal and the area in which public access would be limited is small, so no impacts to recreation are anticipated.
Soils		●		Although the Proposed Action would occur on previously disturbed ground, soils could be affected by the Proposed Action as a result of earth moving activities associated with reclamation.
Social and Economic Values	●			This resource is not present within the Mine Plan Area.
Threatened or Endangered Species	●			No federally threatened or endangered species are known to exist in the Mine Plan Area.
Vegetation			●	Although the Proposed Action would occur on previously disturbed ground, vegetation could be affected by the Proposed Action as a result of earth moving and reseeding activities associated with reclamation. If the decision to remove the existing 4-strand, barbed-wire perimeter fence is made after reclamation standards have been met, then vegetation in the area may benefit from reduced grazing pressure.
Visual Resources			●	Although the Proposed Action would occur on previously disturbed ground, visual resources could be affected by the Proposed Action as a result earth moving activities associated with reclamation.
Waste, Hazardous or Solid			●	As a result of the Proposed Action accidental fuel spills or releases of hazardous materials into the environment could occur.
Water Quality Surface/Ground			●	Proposed action would affect quality of both surface water runoff and underlying groundwater.
Wetlands / Riparian Zones			●	The Proposed Action is near springs and seasonal streams. The Proposed Action could result in temporary impacts to wetlands and riparian zones from the limited, short-term increase of sediment in runoff water from the Mine Plan Area.
Wildlife (including Special Status species)			●	Wildlife could be affected by the Proposed Action as a result of earth moving activities associated with reclamation.
Wild Horses			●	Wild horse movement may be increased if the decision to remove the existing 4-strand, barbed-wire perimeter fence is made after reclamation standards have been met.
Wild and Scenic Rivers	●			No wild and scenic rivers occur in or near the Mine Plan Area.

Critical Element	Not Present	Present, But Not Affected	Present and Potentially Affected	Rationale for Inclusion or Exclusion
Wilderness/lands with wilderness characteristics	•			Project is near the Robertson and Simpson Creek WSA's, neither of which would be affected by the Proposed Action. Lands with Wilderness Characteristics was identified as not present not affected based on an inventory of Lands with Wilderness Characteristics completed in 2012 for Battle Mountain District, as part of the Resource Management Plan Revision in progress for the District. That inventory did not show any areas meeting the criteria for Lands with Wilderness Character in the Project area, and the proposed project activities would not impact any Lands with Wilderness Character.The inventory also will be updated as the Resource Management Plan Revision further progresses for the whole Battle Mountain District...

*As defined by H-1790-1 - National Environmental Policy Act Handbook, Appendix 1: Supplemental Authorities To Be Considered

The potential resources and uses that are present and potentially affected by the Proposed Action are analyzed further in this chapter. This chapter also describes the potential direct, indirect, and residual environmental effects that may result from the Proposed Action and No Action Alternative associated with the APO. Cumulative effects for these resources are discussed in Chapter 4.

Potential resources that are present, but are not affected by the Proposed Action or No Action Alternative are analyzed in this chapter for informational purposes only and are not carried forward for further analysis in Chapter 4.

Finally, resources that are not present and/or are not affected by the Proposed Action or No Action Alternative are not discussed in this chapter, and are not carried forward for further analysis.

The following describes the resources of the human environment that are present and may or may not be potentially affected.

3.2 Air Quality

3.2.1 Affected Environment

The Mine Plan Area lies between the Simpson Park Mountains and the Roberts Mountains. Elevations in the Mine Plan Area average approximately 6,600 feet amsl. The climate is characterized by warm, dry summers and cool moist winters. The average annual precipitation recorded at the weather station located at the University of Nevada, Reno (UNR) Gund Ranch, located approximately 15 miles to the southwest of the Mine Plan Area, is 10.23 inches. The average annual low temperature is 30.4 degrees Fahrenheit (°F) and the average annual high is 63.1°F. The average annual snowfall between 1972 and 2012 was 28.7 inches (**Table 3-2**).

Table 3-2: Monthly Climate Summary (Beowawe Station #260800)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (°F)	40.4	45.6	52	58.8	68.4	78.8	88.3	86.1	78.1	66.2	51.8	42.3	63.1
Average Min. Temperature (°F)	12.9	18.9	25.1	29.4	36.3	43.4	49.9	47.2	38.6	28.7	20.8	13.8	30.4
Average Total Precipitation (in.)	0.96	0.69	1.15	1.12	1.21	0.77	0.52	0.52	0.69	0.91	0.89	0.81	10.23
Average Total Snowfall in.)	6.8	4.2	5.1	3.3	1.4	0	0	0	0	0.5	2.1	5.4	28.7

Period of Record : 9/ 1/1972 to 12/31/2012; Western Regional Climate Center, wrcc@dri.edu

Ambient air quality and the emission of air pollutants are regulated under both federal and state laws and regulations. Regulations potentially applicable to the Proposed Action and the No Action Alternative include the Nevada State Ambient Air Quality Standards and state of Nevada air quality regulations (NAC 445B).

The Mine Plan Area is located within three hydrographic basins: the Grass Valley Basin (No. 138), the Kobeh Valley Basin (No. 139), and the Pine Valley Basin (No. 53). However, the bulk of the Mine Plan Area, including the area of the Proposed Action, lies within the Pine Valley Basin (**Figure 5**). A Basin is defined as a geographic area drained by a single major stream or an area consisting of a drainage system comprised of streams and often natural or man-made lakes. They can also be referred to as Drainage Basin, Watershed, or Hydrographic Region. The U.S. Geological Survey and the Nevada Division of Water Resources, Department of Conservation and Natural Resources, have divided the state into discrete hydrologic units for water planning and management purposes. In

addition, these basins are used in characterizing and quantifying air quality resources and management planning.

The Pine Valley hydrographic basin No. 53 is generally considered 'unclassifiable' or "better than national standards" for all major air pollutants (40CFR§ 81.329 Nevada). An unclassified area is one for which insufficient ambient air quality data are available, and the area may be above or below ambient standards. Unclassified areas are managed as attainment areas. An attainment area is one that does not exceed any national standard of ambient air quality for the pollutant.

3.2.2 Environmental Effects

Proposed Action

Direct, temporary impacts to air quality from fugitive dust, as well as gaseous pollutants such as nitrous oxides, carbon monoxide, and sulfur dioxide, would result from the Proposed Action. Sources of gaseous pollutants would include exhaust emissions construction equipment and light vehicles. Sources of fugitive dust would include clearing, earth moving and wind erosion. TSLLC utilizes operating controls such as watering main roads and construction areas to control fugitive dust, and preventive equipment maintenance to control vehicle emissions.

Impacts to air quality under the Proposed Action would be transitory and temporary, limited in duration, and would end at the completion of the reclamation phase of the project.

No Action Alternative

Direct, temporary impacts to air quality under the No Action Alternative would be similar to the Proposed Action, in that similar earthmoving equipment utilization and construction activities would occur under both the APO and current Plan. TSLLC would continue to utilize operating controls such as watering main roads and construction areas to control fugitive dust, and preventive equipment maintenance to control vehicle emissions.

Because the tailings would be essentially closed and covered in place, fugitive dust from wind erosion are likely to be less than those of the Proposed Action. In the longer-term, the tailings would be under cover in both scenarios.

Impacts to air quality under the No Action Alternative would be transitory and temporary, limited in duration, and would end at the completion of the reclamation phase of the project.

3.3 Cultural Resources

3.3.1 Affected Environment

Ten Class III cultural resource surveys were conducted within and around the Mine Plan Area prior to 2006 and are discussed in further detail in EA #NV063-EA00-43 (BLM, 2001). The Mine Plan Area has been disturbed, so any cultural resources that may have been located within the area have already been mitigated.

The Archaeological Resources Protection Act (ARPA) codified at 43 CFR § 7, as well as the Native American Graves Protection and Repatriation Act (NAGPRA), codified at 43 CFR § 10, both provide protection for historic properties, cultural resources, and Native American funerary items and/or physical remains located on federal land. In addition, ARPA provides for the assessment of criminal and/or civil penalties for damaging cultural resources. Any unplanned discovery of cultural resources, human remains, items of cultural patrimony, sacred objects, or funerary items, requires that all activity in the vicinity of the find ceases, and notification be made to theField Manager, Mount Lewis Field Office, 50 Bastian Way, Battle Mountain, NV, 89820 (775 – 635 – 4000), by telephone, with written confirmation to follow, immediately upon such discovery. Adequate steps would be taken to ensure

protection, and secure the discovery in place until a Notice to Proceed is issued by the Authorized officer..

3.3.2 Environmental Effects

Proposed Action

Under the Proposed Action, there would be no disturbance to known cultural resources. If newly identified cultural resources are encountered they would be avoided as described in Section 2.5. Newly identified sites would be evaluated by a qualified archeologist. If the site meets eligibility criteria and cannot be avoided, a data recovery plan or appropriate mitigation would be completed. If the site does not meet eligibility criteria, no further cultural work would be performed. Impacts to cultural resources are not anticipated.

No Action Alternative

Direct, temporary impacts to cultural resources under the No Action Alternative would be similar to the Proposed Action, in that similar earthmoving equipment utilization and construction activities would occur under both plans. TSLLC would continue to implement environmental protection measures for cultural resources set forth in Section 2.5.

3.4 Noxious Weeds, Invasive and Non-native Species

3.4.1 Affected Environment

A noxious weed is a plant species that has been defined as a pest by law or regulation. The list of the species that are designated as noxious weeds within Nevada is found in the Nevada Administrative Code (NAC), Chapter 555, Section 010 (NAC 555.010). Currently the list contains 47 noxious weed species. When considering whether to add a species to the list, the NDOA makes a recommendation after consulting with outside experts and a panel comprising Nevada Weed Action Committee members. Per NAC 555.005, if a species is found probable to be "detrimental or destructive and difficult to control or eradicate", the NDOA, with approval of the Board of Agriculture, designates the species as a noxious weed. The species is then added to the noxious weed list in NAC 555.010. Upon listing, the NDOA will also assign a rating of "A", "B", or "C" to the species. The rating reflects the NDOA view of the statewide importance of the noxious weed, the likelihood that eradication or control efforts would be successful, and the present distribution of noxious weeds within the state. An invasive species is defined as a species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic concern or environmental harm or harm to human health (Executive Order 13112, signed February 3, 1999).

Noxious weeds and other invasive and non-native species known to occur in the area (but not necessarily the Mine Plan Area) include hoary cress or whitetop (*Cardaria draba*), Russian knapweed (*Acroptilon repens*), Scotch thistle (*Onopordum acanthium*), bull thistle (*Cirsium vugare*), musk thistle (*Carduus nutans*) and minor occurrences of salt cedar (*Tamarix spp.)* (BLM, 2004). Some infestations of musk thistle have been identified in the northern part of the Mine Plan Area, and to the west of the Proposed Action (**Figure 6**).

3.4.2 Environmental Effects

Proposed Action

Surface disturbance resulting from implementation of the Proposed Action has the potential to create conditions favorable for the establishment of noxious weeds and other invasive, non-native species. Weed infestations could spread from existing populations or be introduced into previously weed free

areas from sources outside of the Mine Plan Area. The area of the TSF (once cleared of tailings and impacted soils), would be particularly vulnerable to the encroachment of weeds.

The use of a BLM approved and certified weed-free seed mix (refer to **Table 2-7** in Section 2.4) and the implementation of prompt and appropriate revegetation techniques would reduce the potential for invasive, non-native weed invasion. TSLLC would follow the established BMPs in order to prevent the spread of noxious, invasive weeds in the Mine Plan Area (especially the TSF area).

The Proposed Action would have a minimal potential to spread noxious weeds and other invasive, non-native species from monitoring activities or other vectors such as recreational uses, other mining activities, or wildfires. The redirecting of TSP-1 Pit seepage water, along with the subsequent drying and reclamation of the TSF, would also reduce the likelihood of establishment of water attracted noxious and invasive species, such as salt cedar (*Tamarix sp.*), that establish most frequently in soils that are saturated at the surface.

No Action Alternative

Surface disturbance from reclamation activities under the No Action Alternative also has the potential to create conditions favorable for the establishment of noxious, invasive, non-native species and other undesirable vegetation. The re-disturbance of soils (including the placement of soil cover material) in the areas of the TSF, TSP-1 Pit and sulfide ore stockpiles would be similar under both alternatives, and TSLLC would implement the same environmental protection measures for both.

Impacts form the establishment of noxious, invasive, non-native species under the No Action Alternative would be transitory and temporary, limited in duration, and would be essentially eliminated following successful revegetation of the disturbances associated with reclamation of the site.

3.5 Wildlife (Including Threatened and Endangered Species, Special Status Species, and Migratory Birds)

3.5.1 Affected Environment

The wildlife species observed in the Mine Plan Area are typical of the arid/semi-arid environment in the central Great Basin. The BLM identified mule deer (*Odocoileus hemionus*), pronghorn antelope (*Antilocapra americana*), mountain lion (*Puma concolor*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), badger (*Taxidea taxus*), long-tailed weasel (*Mustela frenata*), gray and kit foxes (*Urocyon cinereoargenteus* and *Vulpes macrotis*), and numerous small mammals, birds, and reptiles, as wildlife species with potential habitat in the Mine Plan Area (BLM, 2007).

Mule deer use a variety of vegetation types and habitats seasonally within the local livestock grazing allotment for forage, thermal cover, and escape cover for seasonal needs. The Project is located within NDOW Hunt Unit 155 (**Figure 7**). Mule deer occupy almost all types of habitat within their range, yet they seem to prefer arid, open areas and rocky hillsides (NDOW, 2005). The vegetation types preferred are primarily mountain brush and aspen habitats. Deer population numbers are dependent upon quality and quantity of browse forage including forbs and woody species such as sagebrush and bitterbrush. The Mine Plan Area contains potential mule deer habitat (BLM, 2007).

Pronghorn antelope occupy the flats and foothills of the Mine Plan Area. The eastern portion of the Mine Plan Area contains pronghorn antelope habitat (BLM, 2007) as shown on **Figure 8**.

Special Status Species

In addition to federally listed species, the BLM also identifies and protects special status species (SSS) by policy (BLM, 1988). The list includes certain species designated by the State of Nevada, as well as

species designated as "sensitive" by the Nevada BLM State Director. Special status species known or believed to occur either in the Mine Plan Area include a number of bat, raptor and migratory bird species.

Bats

The NDOW has identified the following four BLM sensitive bat species as having the potential to occur in the Mine Plan Area and vicinity: small-footed myotis (*Myotis ciliolabrum*), long-eared myotis (*Myotis evotis*), long-legged myotis (*Myotis volans*), and Townsend's big-eared bat (*Corynorhinus townsendii*). The following 12 BLM sensitive bat species were also identified by the NDOW as potentially occurring in the vicinity of the Mine Plan Area (but may or may not occur in the Mine Plan Area): pallid bat (*Antrozous pallidus*), big brown bat (*Eptesicus fuscus*), spotted bat (*Euderma maculatum*), silver-haired bat (*Lasionycteris noctivagans*), western red bat (*Lasiurus blossevillii*), hoary bat (*Lasiurus cinereus*), California myotis (*Myotis californicus*), little brown bat (*Myotis lucifugus*), fringed myotis (*Myotis thysanodes*), Yuma myotis (*Myotis yumanensis*), western pipistrelle (*Pipistrellus hesperus*), and Brazilian free-tailed bat (*Tadarida brasiliensis*) (BLM, 2007). Water sources in Nevada's desert are critical for bats and at least partially determine the distribution and abundance of some of Nevada's bat species. Water sources in Nevada available to bats are either natural (e.g., springs, streams, rivers, wetlands, ponds, and lakes) or artificial (e.g., troughs, spring boxes, reservoirs, some lakes, pools, and industrial process ponds) (Bradley *et al.*, 2006).

Pygmy Rabbit

Pygmy rabbit, *Brachylagus idahoensis*, is a Nevada BLM sensitive species, but was not identified by the Nevada Natural Heritage Program (NNHP) (2012) as potentially existing in the Mine Plan Area (**Figure 9**). Pygmy rabbit habitat typically consists of dense stands of big sagebrush growing in deep loose soils. No pygmy rabbits are expected to occur in the Mine Plan Area.

Greater Sage-Grouse

The U.S. Department of the Interior, Fish and Wildlife Service (FWS) identified the greater sage-grouse (*Centrocercus urophasianus*) as the only federally-listed (candidate) species that may occur in the Mine Plan Area (FWS 2012). Greater sage-grouse inhabit most of the JD Grazing Allotment and several known leks are located within that allotment but outside of the Tonkin Springs Mine Plan Area.

Although the Mine Plan Area contains approximately 2,311 acres of Greater sage-grouse Preliminary Priority Habitat (PPH; **Figure 10**), the surface disturbance associated with this closure project would only occur within approximately 482 acres of PPH and in areas that have been previously disturbed. PPH areas include breeding habitat (lek sites and nesting habitat), brood-rearing habitat, winter range, and important movement corridors.

No greater sage-grouse leks occur inside the Mine Plan Area, but there is one active lek approximately 3.6 miles to the southwest of the project.

Lahontan Cutthroat Trout

Currently, no habitat exists in the Mine Plan Area for Lahontan Cutthroat Trout (LCT). The streams nearest to the Mine Plan Area occupied by LCT include Pete Hanson and Birch Creeks, located in the Roberts Mountains to the east (BLM, 2007).

Golden Eagles

The NDOW (June 2013) identified the Mine Plan Area as being within a distribution range of the golden eagle. The NDOW identified one potential golden eagle nest within ten miles of the Mine Plan Area. The nest was last checked in September in 2011 and was inactive.

Migratory Birds

"Migratory bird" is defined as any bird listed in 50 CFR § 10.13. Migratory birds may be found in the Mine Plan Area as either seasonal residents or as migrants. Provisions of the Migratory Bird Treaty Act (MBTA) (16 USC 701-718h) prohibits the taking of migratory birds, their parts, nests, eggs, and nestlings. Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, was signed on January 10, 2001 to further enhance and ensure the protection of migratory birds, and directs federal agencies to protect migratory birds by integrating bird conservation principles, measures, and practices. **Table 3-3** lists the migratory birds known to have distributions that include the Mine Plan Area and a four-mile survey area (Great Basin Bird Observatory, 2006; NDOW, 2013).

Table 3-3: Migratory Birds with Distributions that Overlap the Mine Plan Area

Common Name	Scientific Name
American Kestrel	*Falco sparverius*
Barn owl	*Tyto alba*
Black rosyfinch	*Leucosticte atrata*
Burrowing owl	*Athene cunicularia*
Cooper's hawk	*Accipiter cooperii*
Ferruginous hawk	*Buteo regalis*
Golden eagle	*Aquila chrysaetos*
Great Horned owl	*Bubo virginianus*
Lewis' woodpecker	*Melanerpes lewis*
Loggerhead shrike	*Lanius ludovicianus*
Merlin	*Falco columbarius*
Northern goshawk	*Accipiter gentilis*
Northern harrier	*Circus cyaneus*
Northern saw-whet	*Aegolius acadicus*
Olive-sided flycatcher	*Contopus cooperi*
Osprey	*Pandion haliaetus*
Peregrine falcon	*Falco peregrinus*
Piñon jay	*Gymnorhinus cyanocephalus*
Prairie falcon	*Falco mexicanus*
Red-naped sapsucker	*Sphyrapicus nuchalis*
Red-tailed hawk	*Buteo jamaicensis*
Roughlegged hawk	*Buteo lagopus*
Sharp-shinned hawk	*Accipiter striatus*
Short-eared owl	*Asio flammeus*
Swainson's hawk	*Buteo swainsoni*
Turkey vulture	*Cathartes aura*
Vesper sparrow	*Pooecetes gramineus*
Yellow-breasted chat	*Icteria virens*

3.5.2 Environmental Effects

Proposed Action

Construction activities associated with implementation of the Proposed Action would be confined to areas of existing disturbance, the reclamation of which would be completed in accordance with the Tonkin Springs Mine Plan of Operations #NVN-067881 and Reclamation Permit (No. 0166), and to the standards described in 43 CFR § 3809.420. The resulting herbaceous-shrub community consisting of vegetation from the BLM approved seed mix (refer to **Table 2-7** in Section 2.4) would provide diversified forage for local wildlife. Eventually, the reclaimed areas would be similar in vegetative composition to the surrounding landscapes.

Mule deer migration is unlikely to be disrupted by the noise and activity associated with reclamation activities. Mule deer and antelope may tend to avoid construction activities, but avoidance should not affect the populations of these species.

Potential nesting habitat for the greater sage-grouse exists within the Mine Plan Area and one active lek is within 4 miles of the proposed project activities. This project involves activities that occur within approximately 482 acres of PPH, although all activites will take place on previously disturbed areas. Impacts to greater sage-grouse and its habitat will be mitigated according to standard measures developed by the BLM and are discussed further in Section 5.1.

Several species of migratory birds can be found in the Mine Plan Area as either seasonal residents or as migrants and may be disrupted by the noise and activity associated with construction activities. The potential impacts to migratory birds would be minimized through the practice of avoidance and migratory bird nesting season surveys, conducted as described in Section 5.1.

The decision to remove the existing four-strand barbed-wire livestock perimeter fence would be made after reclamation standards have been met. If it is determined that this fence should be removed, then wildlife would benefit from the removal of the perimeter fencing around the mine site and subsequent increased vegetative cover and reduced livestock and wild horse stocking rate.

The pH-adjusted water from the TSP-1 Pit, which is currently managed in the TSF, would be redirected and collected in the new Event Pond. This water may be accessible to smaller terrestrial wildlife species as well as avian/volant wildlife. Larger terrestrial wildlife (i.e., deer, antelope, coyotes, etc.) as well as livestock that may wander in search of forage or food and gain access to the Mine Plan Area, would be excluded from the Event Pond by fencing. A Screening-Level Ecological Risk Assessment (SLERA) conducted for this water during the previous plan amendment and impact analysis (BLM, 2008b) found that:

- a low to moderate risk could exist to volant wildlife (bats) that drank from the Event Pond;
- a low risk from thallium toxicity could exist for terrestrial wildlife;
- Total Dissolved Solids (TDS) concentrations in the Event Pond water (ranging from 3,500 to 4,500 mg/L) could pose a low to moderate risk to livestock and wildlife, though that risk would be effectively mitigated by institutional controls (exclusion); and
- no avian species appear to be at risk from exposure to the TSP-1 Pit treated water, or the heap leach pad draindown collected in the Event Pond.

No Action Alternative

The potential impacts to wildlife (including Special Status Species and Migratory Birds) from implementation of the No Action Alternative would essentially be the same as those associated with the Proposed Action.

TSP-1 Pit water and heap leach pad draindown would be collected and contained in the expanded Event Pond rather than the new Event Pond, so exposure of terrestrial and avian/volant wildlife would be unchanged.

The TSP-1 Pit would be backfilled with sulfide ore and waste rock, covered with growth media and revegetated, potentially creating additional wildlife habitat that would normally be limited in non-backfilled open pit mines.

By not removing and relocating the tailings to the TSP-1 Pit, this material would remain approximately 18 inches below the reclaimed surface, and could, in the longer-term, present a physical and/or chemical barrier to the establishment of deep-rooted plant species (e.g., sagebrush), which could reduce the overall quality of the habitat that does re-establish in the impoundment area. The backfilled pit would likely have reduced habitat quality since either sulfidic ore/waste rock or synthetic liner could affect rooting depths during revegetation.

3.6 Native American Religious Concerns

3.6.1 Affected Environment

Located within the traditional territory of the Western Shoshone, the BMD administrative boundary contains spiritual, traditional, and cultural resources sites important in social practices that aid in maintaining and strengthening social, cultural, and spiritual integrity. Recognized tribes with interests within the BLM BMD administrative boundary are: the Te-Moak Tribe of Western Shoshone (Elko, South Fork, Wells, and Battle Mountain Bands), Duck Valley Sho-Pai Tribes of Idaho and Nevada, Duckwater Shoshone Tribe, Ely Shoshone Tribe, Yomba Shoshone, Timbisha Shoshone, and various other community members and individuals.

Though archaeological data and theory states that the Western Shoshone (Newe) began to inhabit the Great Basin area around 600 years ago, contemporary Western Shoshone contend they were here since time immemorial. Through discussions between BLM and Tribal members, the Roberts Mountains and the Tonkin Springs areas were once the locations of prehistoric and historic village and camp sites and contained significant pine nut harvesting and hunting areas. Specifically, Roberts Creek and the Tonkin Springs area were known to produce consistent pine nut crops. Cultural resources inventory and survey (archaeological sites and artifacts) support the traditional/cultural use information given by tribal members.

In accordance with the National Historic Preservation Act (P.L. 89-665), the NEPA, the Federal Land Policy and Management Act (P.L. 94-579), the American Indian Religious Freedom Act (P.L. 95-341), the Native American Graves Protection and Repatriation Act (P.L. 101-601) and Executive Order 13007, the BLM must make efforts to identify locations having traditional cultural or religious values to Native Americans and insure that land management actions do not unduly or unnecessarily burden the pursuit of traditional religion or life ways by inadvertently damaging important locations or hinder access. There are no identified traditional cultural properties documented in the Mine Plan Area. There has been no apparent interest by local Native Americans in this Proposed Action.

3.6.2 Environmental Effects

Proposed Action

Various tribes and bands of the Western Shoshone have stated that federal projects and land actions can have widespread effects to their culture and religion as they consider the landscape as sacred and as a provider. Although no cultural properties are known to exist within the vicinity of the Mine Plan Area and construction activities associated with implementation of the Proposed Action would be confined to areas of existing disturbance, the BLM continues to solicit input from local tribal entities.

Native American Consultation letters were sent out to the Duckwater Shoshone Tribe, Western Shoshone Battle Mountain Band, and the Western Shoshone Elko Band on June 25th, 2013. No written responses have been received; however, Native American Consultation is an ongoing process.

No Action Alternative

Potential impacts to Native American Religious Concerns under the No Action Alternative would be similar to the Proposed Action in that similar earthmoving equipment utilization and construction activities would occur under both the APO and current Plan. Under the No Action Alternative, there would be no changes to existing and authorized activities in the area. No additional impacts to Native American Religious Concerns are anticipated under the No Action Alternative.

3.7 Waste, Hazardous and Solid

3.7.1 Affected Environment

Solid waste from the Tonkin Springs Mine is currently disposed of on-site at the existing Class III solid waste landfill located just north of the Event Pond. No hazardous wastes, as defined by the Resource Conservation and Recovery Act (RCRA), 42 USC Section 1004(5), are stored at the site.

3.7.2 Environmental Effects

Proposed Action

Potential impacts related to hazardous wastes would include accidental fuel spills or releases into the environment from earthmoving equipment being used at the site. Potential impacts related to solid waste would include improper disposal onsite and the spreading of solid wastes by wind or wildlife. TSLLC has committed to various environmental protection measures (See Section 2.5) which would make these occurrences unlikely and the potential for impact low.

The site spill contingency plan would be adhered to for the prevention of spills, and for the appropriate handling of spills in the event that they should occur. Spills would be handled and materials disposed of according to NDEP guidelines. Potential impacts from solid and hazardous waste would end at the completion of the reclamation phase of the project.

No Action Alternative

Potential impacts from solid and hazardous wastes under the No Action Alternative would be similar to the Proposed Action, in that similar earthmoving equipment utilization and construction activities would occur under both the APO and current Plan. Under the No Action Alternative, TSLLC would continue to implement environmental protection measures outlined in Section 2.5.

3.8 Water Quality, Surface and Ground

3.8.1 Affected Environment

Surface (Drinking) Water

The Tonkin Springs Mine Plan Area is located within the Jackass Creek-Coils Creek and Upper Denay Creek hydrographic sub-watersheds. Surface waters within these sub-watersheds include Indian Spring, Tonkin Spring, Coils Creek, Denay Creek, and several unnamed intermittent springs and drainages; the intermittent springs and drainages run dry during the summer months. Four of the unnamed intermittent springs are within the Mine Plan Area and lie within 1-2 miles to the west and northwest of the area of the Proposed Action (**Figure 11**). These unnamed springs are upgradient and/or cross-gradient of the Proposed Action and would not be affected by closure activities. Tonkin

Spring is the closest perennial water source downgradient of the Mine Plan Area and activities associated with Proposed Action, lying approximately ½ mile to the southeast of the Tonkin Springs Mine tailings impoundment (**Figure 11**). Tonkin Spring is one of the district's highest discharge and most functional springs, supporting a broad and diverse riparian area. Discharge response lags months behind precipitation events (peak discharge is during the dry season), indicating that shallow subsurface flow paths likely dominate, rather than overland flow. The spring is gauged by the U.S. Geological Society (USGS), data for which can be obtained from http://nwis. waterdata.usgs.gov/.

Denay Creek, which is fed by Tonkin Spring, is less than 1.0 mile east of the Mine Plan Area, flowing to the north. Tonkin Reservoir, an approximately four-acre, man-made body of water and potential drinking water source, is located on Denay Creek (**Figure 11**). Tonkin Reservoir and Denay Creek are class A waters with defined water quality standards located just downgradient of the Mine Plan Area. The Nevada Beneficial Use Standards defined for Denay Creek and Tonkin Reservoir (presented in NAC 445A.1512, .1514, and .1516) include: livestock watering, irrigation, aquatic habitat, recreational contact, non-contact recreation, municipal water supply, and, wildlife propagation. Denay Creek below Tonkin Reservoir also includes industrial use. Quantitative and qualitative standards for Denay Creek and Tonkin Reservoir are defined in NAC 445A.1236 *Standards for toxic materials applicable to designated waters*.

According to the National Hydrography Dataset (NHD) (http://nhd.usgs.gov/), three additional unnamed springs are located just outside of the Mine Plan Area near the Proposed Action (**Figure 11**). These springs lie upgradient and/or cross-gradient from the areas of activity and would not be impacted by the Proposed Action. As such, they have been eliminated from further consideration and discussion.

Water at the Tonkin Springs Mine man camp is obtained from a domestic groundwater well located at the man camp site. The mine processing/production supply well, which is located about 0.5 miles from the man camp, is of domestic supply beneficial use quality, but, since the well was not constructed as a domestic well, it has been designated non-potable. Drinking water at the mine site is brought in as bottled water.

Groundwater

Several hydrogeological studies (HCI, 1995, 1996; Simon Hydro-Search, 1994) have been conducted in the Mine Plan Area, the most recent of which was performed for the TSP-1 pit area (SRK, 2000). The following summary is based on the data gathered during these investigations.

Regionally, groundwater from the Denay Valley drains in a north-northeasterly direction toward the Humboldt River, which flows westerly, eventually reaching the Carson Sink. The Mine Plan Area is located near the head of the Denay Valley Drainage where the Simpson Park and Roberts Mountains converge. Groundwater occurs in variable amounts in each geological unit, with flows generally following the topography. Geological structures (faults, dikes, etc.) play a significant role in controlling the groundwater flow system.

3.8.2 Environmental Effects

Proposed Action

The Proposed Action could result in a limited, short-term increase of sediment in runoff water in the Mine Plan Area as the currently disturbed (but stabilized) soils would be subject to earthmoving activities that could make them vulnerable to increased erosion. Similarly, the removal of the tailings from the current impoundment, and the exposure of disturbed soils within the impoundment basin, could lead to an increased in sediment loading to Denay Creek and Tonkin Reservoir, possibly affecting the overall water quality of the drainage and exceeding the beneficial use standards established for these water bodies. However, with the adherence to the prescribed environmental

protection measures and BMPs, the potential direct impacts to surface water are considered to be negligible.

By relocating this source material back into the TSP-1 Pit, and covering them with an impermeable plastic liner, water would be prevented from potentially percolating through the tailings and penetrating the groundwater table. The tailings would be effectively isolated from further exposure to groundwater resources in the area. In addition, the requirement for active fluid management of the tailings seepage collection system would be eliminated.

Similarly, the sulfide-bearing ore stockpiles and road materials also represent a possible source of surface water and groundwater contamination. Their relocation to the TSP-1 Pit would consolidate them in a managed facility, and limit further contact with meteoric waters.

No Action Alternative

Under the No Action Alternative, reclamation of the tailings would occur in situ, with the regrading and covering of the tails with 18 inches of cover material. While surface waters would, for the most part, be directed away the tailings area, some infiltration may occur through the soil cover. This could represent a longer-term risk to local groundwater resources. Additionally, active management of the tailings seepage collection system would be required to be maintained over the long term.

Similarly, while the sulfide ore stockpiles would still be relocated back into the TSP-1 Pit, this material would not be encapsulated by a synthetic liner, and would not be completely cut off from meteoric infiltration. This water could report to groundwater or continue to be collected as seepage from the pit, to be managed in the expanded evaporation pond.

Long-term fluid management would involve large evaporation ponds under both scenarios; one expanded, one new.

3.9 Wetlands/Riparian Zones

3.9.1 Affected Environment

Four unnamed springs and one potential riparian meadow exist within the Mine Plan Area. However, no known springs, wetlands, or riparian zones exist within the immediate proximity of the Proposed Action (**Figure 11**). There are several riparian features located within the vicinity of the mine, but outside of the Mine Plan Area, including: Indian Spring, Tonkin Spring, Coils Creek, Denay Creek, and several smaller unnamed springs identified in the NHD (http://nhd.usgs.gov/) (**Figure 11**). These features, along with the potential riparian meadow and the four unnamed springs located within the Mine Plan Area lie within 1-2 miles of the area of the Proposed Action activities (**Figure 11**). Denay Creek and Tonkin Spring are less than one mile east of the Mine Plan Area and the activities of the Proposed Action. Both Denay Creek and Coils Creek are important riparian/wetland habitats. The unnamed springs within and to the south of the Mine Plan Area are upgradient and/or cross-gradient of the Proposed Action and would not be affected by the proposed closure activities. For the most part, surface waters within the Mine Plan Area consist of intermittent drainages, most of which run dry during the summer months.

3.9.2 Environmental Effects

Proposed Action

Under the Proposed Action, earth moving activities would be confined to areas of existing disturbance. Implementation of the Proposed Action could result in a limited, short-term increase of sediment in runoff water from the Mine Plan Area as the currently disturbed (but stabilized) soils would be subject to earthmoving activities that could make them vulnerable to increased erosion. However, with the

adherence to the prescribed environmental protection measures and BMPs, the potential direct impacts to wetlands/riparian zones are considered to be negligible. Any impacts to wetlands/riparian areas would be temporary and would occur during earth moving activities associated with reclamation of the mine facilities.

No Action Alternative

Impacts to wetlands/riparian zones under the No Action Alternative would be similar to the Proposed Action, in that similar earthmoving activities associated with reclamation of the mine facilities would occur under both the APO and current Plan.

3.10 Fire Management

3.10.1 Affected Environment

The Mine Plan Area lies within the Three Bars Fire Management Unit, which has a relatively high fire occurrence and a history of large fires. Since 1994, seven wildland fires have been recorded in the Mine Plan Area. The Trail Canyon fire of 1999 burned approximately 106,500 acres, of which approximately 3,000 to 4,000 acres were in and around the western portion of the Mine Plan Area. Other fires burned a total of approximately 2,084 acres in and around the Mine Plan Area. Following the Trail Canyon fire, soil stabilization and revegetation treatments were implemented. A map showing the fires that have burned in the proximity of the Mine Plan Area can be found in **Figure 12**.

3.10.2 Environmental Effects

Proposed Action

Implementation of the Proposed Action would be coordinated with the BMD fire staff in order to ensure the safety of TSLLC personnel during periods of prescribed fire activity pertaining to the Red Hills Hazardous Fuels Reduction Project. Prescribed fire activities may occur in the late spring or fall seasons, or until the Red Hills Hazardous Fuels Reduction Project is completed.

Based on fire avoidance measures to be implemented under the Proposed Action, and the fact that the Mine Plan Area would continue to be accessible, no impacts to fire management are anticipated. In addition, reclamation measures include seeding with native vegetation that may be more favorable to fire avoidance and suppression in the long term.

No Action Alternative

Impacts to fire management under the No Action alternative would remain the same as for the Proposed Action, as similar construction activities, and overall site reclamation would be the end result for both scenarios.

3.11 Grazing Management

3.11.1 Affected Environment

The Mine Plan Area is located on the JD Grazing Allotment administered by the BMD. The JD Grazing Allotment consists of 145,934 acres of land and is presently managed for approximately 8,200 cattle animal unit months (AUMs) annually from May 1 through January 31. An AUM represents the amount of forage required to support one cow and calf pair for one month.

The Mine Plan Area is enclosed by a four-strand, barbed-wire livestock perimeter fence which precludes livestock access. The decision to remove this fence would be made after reclamation standards have been met.

3.11.2 Environmental Effects

Proposed Action

Under the Proposed Action, the decision to remove the four-strand, barbed-wire livestock perimeter fence would be made after reclamation standards have been met. If it is determined that this fence should be removed, then livestock grazing would resume in the Mine Plan Area in accordance with the Transfer of Grazing Preference for the JD and Grass Valley Allotments Decision (Decision) dated November 16, 2012. No AUMs were suspended due to development of the Tonkin Spring Mine; in addition, the reclamation and reopening of the mine area to grazing will result in no change to AUMs. Closure of the mine would result in the reopening of 1,400 acres which would increase the available area utilized by livestock and other animals. Increased area would allow for better distribution of animals and decrease the potential of congregation and exceeding utilization triggers identified in the Decision. Wildlife such as mule deer and the greater sage grouse would also benefit from the reduced potential of overgrazing and an increase in available habitat.

Livestock would also benefit from the reduced stocking rate in that the increased distribution will decrease the likelihood of exceeding the utilization triggers specified in the Decision. Wildlife, including mule deer and greater sage-grouse would also benefit from the reduced livestock and wild horse stocking rate and increased vegetative cover.

No Action Alternative

Under the No Action Alternative the existing four-strand barbed wire fence would be removed during closure activities. By removing the existing four strand barbed wire fence before reclamation standards have been met, no benefits to wildlife would be realized, although grazing movement in the area would be less restricted. There would be no increase in AUMs on the JD Grazing allotment through the removal of the four-strand barbed wire fence during closure activities.

3.12 Soils

3.12.1 Affected Environment

The pre-mining Soils within the Mine Plan Area are typical of valley fans and steep mountain slopes of the north-central Great Basin. Slopes vary from inset fans with slow runoff to the crest and shoulders of ballenas with medium runoff to slopes of mountains with very rapid runoff. Soils in the Mine Plan Area were mapped prior to disturbance by the U.S. Soil Conservation Service (now known as the Natural Resource Conservation Service [NRCS]), the BLM, and the University of Nevada Agricultural Experiment Station, as part of a Soil Survey of Eureka County (NRCS 1989). Characteristics of the soil associations in the Mine Plan Area prior to mine disturbance are defined in **Figure 13**. The soils in the Mine Plan Area ranged in texture from sandy loam to very gravelly loam to extremely stony loam. According to the NRCS, the erosion potential by water for the various soils found in the Mine Plan Area varies from slight to severe and the erosion potential by wind for all soils in the Mine Plan Area also ranges from slight to severe (**Figure 14**).

3.12.2 Environmental Effects

Proposed Action

Soils would be impacted by reclamation activities as the soil is mixed from spreading, ripping, and seeding activities. The microbial communities that were recovering in the stock piles of top soil would once again be disturbed. The soils would be unstable with a high potential for erosion when first reclaimed until they stabilized by vegetative growth. Successful revegetation would aid in the establishment of ecological processes, such as nutrient cycling and hydrologic function, which will begin to redevelop soil horizons and enhance the productivity of the soils in the long term.

No Action Alternative

Impacts to soils under the No Action Alternative would be similar to the Proposed Action, in that similar earthmoving activities associated with reclamation of the mine facilities would occur under both the APO and current Plan.

3.13 Vegetation

3.13.1 Affected Environment

The Mine Plan Area is located in the Intermountain Region in the Central Great Basin Section of the Great Basin Division. The Mine Plan Area is located on the northern edge of the Simpson Park Range and west of the Roberts Mountains. Prior to mining, vegetation in the vicinity of the Mine Plan Area was consistent with Great Basin cold desert steppe, dominated by sagebrush/bunchgrass and piñon-juniper communities, with other shrubs, forbs, and grasses present (**Figure 15**). The Mine Plan Area includes six Rangeland Ecological Sites and one Forestland Ecological Site. The ecological sites are associated with the soil map units identified in (**Figure 13)**. The ecological sites within each soil map unit are identified in **Table 3-4** and the dominant vegetative communities within each ecological site [>20 percent of the dry weight in pounds (lbs.) of species per acre] are identified in **Table 3-5**.

Table 3-4: Ecological Sites Within Each Soil Map Unit*

Map Unit Symbol			
311	Eightmile-Loncan-Glean association	Eightmile (50%)	F024XY049NV
		Loncan (20%)	R028BY030NV — LOAMY 12-16 P.Z.
		Glean (15%)	R028BY030NV — LOAMY 12-16 P.Z.
		Welch (5%)	R025XY005NV —WET MEADOW
321	Mau-Shagnasty-Eightmile association	Mau (45%)	R028BY007NV — LOAMY 10-12 P.Z.
		Shagnasty (30%)	F024XY049NV
		Eightmile (15%)	F024XY049NV
501	Hymas-Ansping association	Hymas (55%)	F024XY049NV
		Ansping (30%)	F024XY049NV
681	Chad-Cleavage-Softscrabble association	Chad (45%)	R028BY027NV — SHALLOW CALCAREOUS SLOPE 14+ P.Z.
		Cleavage (20%)	R028BY034NV — MOUNTAIN RIDGE 12-14 P.Z.
		Softscrabble (20%)	R028BY030NV — LOAMY 12-16 P.Z.
682	Chad-Gando-Softscrabble association	Chad (45%)	R028BY027NV — SHALLOW CALCAREOUS SLOPE 14+ P.Z.
		Gando (20%)	R028BY034NV — MOUNTAIN RIDGE 12-14 P.Z.
		Softscrabble (20%)	R028BY030NV — LOAMY 12-16 P.Z.
		Welch (5%)	R025XY005NV — WET MEADOW
701	Loncan-Gando-Glean association	Loncan (40%)	R028BY030NV — LOAMY 12-16 P.Z.
		Gando (25%)	R028BY034NV — MOUNTAIN RIDGE 12-14 P.Z.
		Glean (25%)	R028BY030NV — LOAMY 12-16 P.Z.
		Welch (5%)	R025XY005NV — WET MEADOW
762	Shagnasty-Softscrabble association	Shagnasty (60%)	F024XY049NV
		Softscrabble (25%)	R028BY030NV — LOAMY 12-16 P.Z.
		Welch (5%)	R025XY005NV — WET MEADOW
764	Shagnasty-Ravenswood-Rock outcrop association	Shagnasty (45%)	F024XY049NV
		Ravenswood (25%)	F024XY049NV
		Rock outcrop (15%)	**
781	Walti-Softscrabble-Chad association	Walti (40%)	R028BY037NV — CLAYPAN 12-14 P.Z.
		Softscrabble (25%)	R028BY030NV — LOAMY 12-16 P.Z.
		Chad (20%)	R028BY027NV — SHALLOW CALCAREOUS SLOPE 14+ P.Z.
891	Whitepeak-Quarz-Softscrabble association	Whitepeak (35%)	R028BY037NV — CLAYPAN 12-14 P.Z.
		Quarz (25%)	R028BY007NV — LOAMY 10-12 P.Z.
		Softscrabble (25%)	R028BY030NV — LOAMY 12-16 P.Z.

*Source: Natural Resources Conservation Service (NRCS) Custom Soil Resource report for Eureka County Area, Nevada. January 20, 2014.
**No ecological site identified

Table 3-5: Dominant Vegetation Communities Within Each Ecological Site*

Ecological Site Code			Dominant Plant Species		
			Plant Symbol	***Common Name***	***Percent by weight per acre***
Rangeland Ecological Sites					
R025XY005NV	Wet Meadow	March 1969	DECE	tufted hairgrass	30-60%
R028BY007NV	Loamy 10-12" P.Z.	October 1980	ACTH7	Thurber's needlegrass	30-40%
			PSSP	bluebunch wheatgrass	15-30%
			ARTR2, ARTRW, ARTRV	big sagebrush, Wyoming big sagebrush, mountain big sagebrush	15-25%
R028BY027NV	Shallow Calcareous Slope 14+" P.Z.	September 1987	ARNO4		
			PSSPS	bluebunch wheatgrass	60-80%
			ARNO4	black sagebrush	25-35%
R028BY030NV	Loamy 12-16"	May 1980	PSSPS	bluebunch wheatgrass	30-40%
			ARTRV	mountain big sagebrush	15-25%
R028BY034NV	Mountain Ridge 12-14" P.Z.	May 1980	ARAR8, ARNO4	low sagebrush, black sagebrush	35-45%
			PSSPS	bluebunch wheatgrass	20-40%
			ACTH7	Thurber's needlegrass	10-20%
R028BY037NV	Claypan 12-14" P.Z.	September 1987	ARAR8	low sagebrush	25-35%
			PSSPS	bluebunch wheatgrass	20-30%
			ACHNA	needlegrass	15-25%
Forestland Ecological Site					
F024XY049NV	PIMO-JOUS WSG: 0R0501	October 1996	JOUS	Utah juniper	50-70%**
			PIMA	Singleleaf pinyon	30-50%**

*Source: NRCS Custom Soil Resource report for Eureka County Area, Nevada. January 20, 2014.
**Overstory tree canopy composition

The mining disturbance within the Mine Plan Area has altered the vegetative regime in and around the open pits, waste rock dumps, and process facilities. The dominant vegetation in areas previously disturbed is Green rabbitbrush (*Chrysothamnus viscidiflorus*).

3.13.2 Environmental Effects

Proposed Action

Negative impacts to vegetation communities as a result of the Proposed Action are not anticipated because the vegetation communities have already been disturbed through development of the mine. The proposed action is an amendment to the APO which requires reclamation of disturbed areas. Reclamation efforts may revegetate disturbed areas and foster the restoration of ecological processes such as nutrient cycling, hydrologic function and biotic integrity. Upon successful reclamation of disturbed areas, the existing vegetation communities would become restored over time. Once established, vegetation would reduce the potential of wind and water erosion.

Under the Proposed Action, the decision to remove the existing four-strand, barbed-wire livestock perimeter fence would be made after reclamation standards have been met; if it is determined that this fence should be removed, then vegetation in areas outside of the Mine Plan Area would benefit from reduced grazing pressure.

No Action Alternative

Under the No Action Alternative the existing four-strand barbed-wire livestock perimeter fence would be removed during closure activities. By removing the existing four-strand barbed-wire livestock perimeter fence before reclamation standards have been met, no benefits to vegetation would be realized. Potential impacts to vegetation from earthmoving activities under the No Action Alternative would be similar to the Proposed Action, in that similar earthmoving equipment utilization and construction activities would occur under both the APO and current Plan.

3.14 Visual Resources

3.14.1 Affected Environment

The Mine Plan Area is located in a Class IV Visual Resource Management (VRM) area. The objective of this class is to provide for management activities that allow for major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. Management activities could dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of such activities through careful location, minimal disturbance and repeating the basic elements of line, form, color, and texture (BLM 1986a).

The natural landscape is gently sloping to the east and is vegetated with sagebrush and piñon-juniper communities. Land and vegetation colors in the foreground and mid-ground are shades of green and tan, while the background includes dark green from the piñon/juniper trees and patches of tan and brown. The skyline in the west is dominated by the Simpson Park Mountains. Existing manmade features that are prominent in the Mine Plan Area include roads, road cuts, pit highwalls, the heap leach pad, TSF, and mine buildings.

3.14.2 Environmental Effects

Proposed Action

Under the proposed action, earth moving activities would be confined to areas of existing disturbance. Impacts to visual resources would generally be temporary and would occur during earth moving activities associated with reclamation of the mine facilities. Impacts to visual resources resulting from implementation of the Proposed Action are anticipated to be minimal and are in conformance with the objectives of VRM Class IV objectives.

No Action Alternative

Impacts to visual resources under the No Action Alternative would be similar to the Proposed Action, in that similar earthmoving activities associated with reclamation of the mine facilities would occur under both plans.

3.15 Wild Horses

3.15.1 Affected Environment

The BLM is responsible for the protection, management and control of wild horses on public lands in accordance with the Wild Free-Roaming Horse and Burro Act of 1971 as amended (Public Law 92-

195 Act) which states that the BLM "shall manage wild free-roaming horses in a manner that is designed to achieve and maintain a thriving natural ecological balance on the public lands."

The Mine Plan Area lies within the Rocky Hills Herd Management Area (HMA) (BLM, 1986b). The Rocky Hills HMA (**Figure 16**) is approximately 84,000 acres in size and has an established Appropriate Management Level (AML) of 86-143 wild horses. The current estimated population is 110-150 wild horses. There are fences in the southern portion of the HMA that restrict wild horse movement into the southern portion of the HMA south of Rooster Canyon, and in the vicinity of the Tonkin Springs Mine Plan Area. A four-strand, barbed-wire livestock perimeter fence which precludes livestock grazing surrounds the Mine Plan Area, effectively excluding wild horses.

3.15.2 Environmental Effects

Proposed Action

Under the Proposed Action, the decision to remove the four-strand, barbed-wire livestock perimeter fence would be made after reclamation standards have been met. If the fence is removed after the reclamation standards have been met, overall forage availability for wild horses would be improved.

No Action Alternative

Under the No Action Alternative the existing four-strand barbed-wire livestock perimeter fence would be removed during closure activities. By removing the existing four-strand barbed-wire livestock perimeter fence before reclamation standards have been met, no benefits to wildlife would be realized, although grazing movement in the area by wild horses would be less restricted.

3.16 Geology and Minerals

3.16.1 Affected Environment

The Mine Plan Area is located in the Basin and Range Physiographic Province of the western United States. This region is defined by north-south trending mountain ranges separated by wide basins as a result of block faulting. The geological units identified in the Mine Plan Area include, from oldest to youngest, the Ordovician Vinini Formation, the Devil's Gate Limestone, Tertiary intrusive rocks, and Tertiary volcanic rocks. The geology of the Mine Plan Area is provided on **Figure 17**. A recent age date taken from carbonate rocks located to the west of the mine area and current geologic mapping has shown that previously mapped Ordovician rocks are actually lower plate rocks, early to middle Devonian in age. These lower plate rocks are generally more favorable host rock for mineralization.

The Vinini Formation in the Mine Plan Area is divided into three major local members: the Telephone Member, the Rooster Member, and the Coils Member. The Telephone Member is the lowest member and is comprised of thin to medium-bedded, grey, blocky, sandy to silty carbonates, calcareous carbonaceous shales, and micrites, with thin-bedded limestone in the upper part. The Rooster Member overlies the Telephone Member in a low-angle fault contact. The Rooster Member is comprised of cherts, shales, argillites, siltstones, and laminated silty limestone. The Rooster and Telephone Members were deposited as sediments in near-shore to abyssal environments and then later tectonically juxtaposed during the Mississippian Antler Orogeny.

Three sets of thrust faults have been mapped in the Mine Plan Area. The thrusts are thought to represent a set of imbricate structures sympathetic with the major Roberts Mountain thrust fault that occurred during the Mississippian Antler Orogeny. The rocks were transported in major slabs of flattened ellipsoidal shape. Long axes of the slabs are oriented north-northwest-south southeast. Compression continued after movement of the slabs stopped, folding the slabs to varying degrees along their long axes.

All mineralization located in the Telephone Member is within or adjacent to low angle structures. Mineralization occurs in highly fractured areas associated with structures and within breccias formed during the emplacement of low-angle thrust faults and later crosscut by highangle fractures. Most of the gold mineralization occurs in pyrite and arsenopyrite. Other sulfide minerals identified include marcasite, realgar, orpiment, cinnabar, sphalerite, and stibnite. Common secondary minerals are geothite, jarosite, scorodite, and variscite. Barite is widespread throughout the Mine Plan Area. Elevated concentrations of arsenic, antimony, thallium and mercury are found near deposits and also occur over weakly mineralized and barren ground. The district was discovered in 1979 during a regional sediment sampling program that identified anomalous arsenic throughout the area.

Exploration has been conducted in the Tonkin Springs area since the 1950s and the Tonkin Springs Mine, which produced over 30,000 ounces of gold, was developed during the 1980s.

3.16.2 Environmental Effects

Proposed Action

Under the Proposed Action, earth moving activities would be confined to areas of existing disturbance. As a result of the Proposed Action, backfilling of the TSP-1 Pit may hinder future access to known mineral resources by requiring the re-handling of material from the pit. Besides potential re-handling of waste material, the Proposed Action would not adversely affect future resource extraction in the Mine Plan Area.

No Action Alternative

Under the No Action Alternative, TSP-1 Pit would not be backfilled and future access to known mineral resources would not be hindered. Impacts to geological resources as a result of the No Action Alternative would be minimal.

3.17 Paleontological Resources

3.17.1 Affected Environment

The Mine Plan Area falls within Class III potential for paleontological resources, therefore, paleontological resources are not expected to occur. Potential impacts to paleontological resources from the Proposed Action are unlikely. If paleontological resources are found during operations, impacts would be mitigated through avoidance and/or data recovery.

3.17.2 Environmental Effects

Proposed Action

Impacts to paleontological resources are unlikely as a result of the Proposed Action because all earthmoving activities would occur within areas that are already disturbed.

No Action Alternative

Impacts to paleontological resources under the No Action Alternative would be similar to the Proposed Action, in that similar earthmoving activities associated with reclamation of the mine facilities would occur under both the APO and current Plan.

3.18 Recreation

3.18.1 Affected Environment

Impacts to recreation use would likely be minimal based on the lack of established facilities and natural features that would tend to attract recreationalists. While there would be the occasional inconvenience of increased closure-related traffic on existing roads that would be used for access, implementation of the Proposed Action would not prevent or prohibit use of these roads. Access to public lands within the Mine Plan Area would be temporarily restricted during closure activities for safety reasons.

Open pits with high-wall cut slopes will remain fenced with 4-strand barbed-wire, including TSP-2, TSP-3, TSP-5, TSP-7 and the highwall above TSP-4. Because recreation in the area is minimal and the area in which public access would be limited is small, no impacts to recreation are anticipated.

3.18.2 Environmental Effects

Proposed Action

There would be no impacts to recreation as a result of the Proposed Action because all activities would occur within areas that are already disturbed.

No Action Alternative

Impacts to recreation under the No Action Alternative would be similar to the Proposed Action, in that similar activities associated with reclamation of the mine facilities would occur under both the APO and current Plan.

4.0 Cumulative Impacts

This chapter analyzes the potential cumulative impacts from past, present, and reasonably foreseeable future actions combined with the TSLLC proposed exploration program within a defined Cumulative Effects Study Area (CESA). As defined by federal regulations (40 CFR § 1508.7), cumulative impacts are: "…the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions." Cumulative effects can result from individually minor, but collectively significant actions taking place over a period of time.

Therefore, as required under NEPA, this chapter addresses the cumulative effects on the identified environmental resources in the Cumulative Effects Study Areas (CESA) which could result from the implementation of the Proposed Action.

For the purposes of this analysis and under federal regulations, “impacts” and “effects” are assumed to have the same meaning and are interchangeable.

4.1 Cumulative Effects Study Areas

Watershed boundaries were used to create a CESA in order to evaluate the cumulative impacts associated with the majority of the resources identified for analysis in this assessment.

The CESA for this EA was determined through an examination of the Hierarchical Unit Classification (HUC) system of the U.S. Geologic Survey. The U.S. is divided and sub-divided into successively smaller hydrologic units, which are classified into four levels: regions, sub-regions, accounting units, and cataloging units. The hydrologic units are arranged within each other, from the smallest (cataloging units) to the largest (regions). Each hydrologic unit is identified by a unique hydrologic unit code consisting of two to eight digits based on the four levels of classification in the hydrologic unit system. HUC 5, HUC 6, and HUC 7 refer to different sizes of hydrologic units or watersheds. A HUC 5 watershed ranges from 40,000 to 250,000 acres in size. A HUC 6 watershed, or sub-watershed, ranges from 10,000 to 40,000 acres in size, and is the typical size of watershed at which a landscape analysis is conducted. A HUC 7 watershed, or sub-sub-watershed, is typically less than 10,000 acres in size, averaging approximately 2,500 acres.

For this EA, the HUC 5 hydrographic basins, those typically considered for a CESA by the Mount Lewis Field Office (MLFO), was considered too large of an area to evaluate the incremental impacts associated with the Proposed Action. Instead, the immediate HUC 12 watersheds around the Mine Plan Area (Upper Denay Creek and Jackass Creek-Coil Creek watersheds) were combined into a single unit encompassing 49,950 acres (**Figure 18**). The Mine Area lies within this defined CESA, and was used for the cumulative impact assessment for the following resources:

- Air Quality;
- Noxious Weeds;
- Water Quality (Surface/Ground);
- Geology and Minerals;
- Wetlands and Riparian Zones;
- Wild Horses;
- Visual Resources;
- Vegetation;
- Grazing Management;

- Waste, Hazardous and Solid;
- Native American Religious Concerns;
- Cultural Resources;
- Fire Management; and
- Wildlife (including Special Status Species and Migratory Birds).

The following sections offer past actions, present actions, and reasonably foreseeable future actions for the area of the proposed TSLLC interim water management program. Mining, as well as livestock and wild horse grazing, are the primary past and present activities in this region. It is reasonable to expect that exploration and mining activities would continue to increase in this region based on the fact that this area is mineral rich, and the price of precious metals continues to remain above historic values. All of the actions and uses have the potential to affect the environmental resources of concern within the identified CESA. The past, present, and reasonably foreseeable mining activities are outlined in **Table 4-1**.

Table 4-1: Past, Present, and Reasonably Foreseeable Mining Disturbance

Actions	Past and Present Approved Disturbances		RFFA Projected Disturbance (acres)	Total Approved + Projected Disturbance (acres)
	Total Approved Disturbances (acres)	Remaining Disturbances (acres)		
Total of 5 Notices	3.47	1.63	1.63	3.47
Total of 5 Plans	1221.2	0.3	0.3	1221.2
Total of 0 Sand & Gravel	0	0	0	0
Notices				
NVN 087961	1.71	1.09	1.09	1.71
NVN 088817	0.81	0	0	0.81
NVN 089695	0.25	0.02	0.02	0.25
NVN 090182	0.363	0.363	0.363	0.363
NVN 090825	0.34	0.16	0.16	0.34
Plans				
NVN 066464	21.2	0	0	21.2
NVN 067124	597.5	0	0	597.5
NVN 067881	448.3	0	0	448.3
NVN 067934	29.2	0.3	0.3	29.2
NVN 088264	125.0	0	0	125
Total	1224.67	1.93	1.93	1224.67

Updated February 8, 2013 from BLM LR2000 database for plans (380910) and notices (380913) within the CESA boundary (BLM 2013b).

4.2 Past Actions

Past actions have been associated primarily with mining and exploration, livestock grazing, dispersed recreation, wildland fire, fire fuels treatments, fire rehabilitation, and wild horse gathers. Multiple wildland fires have been recorded in the CESA and Mine Plan Area since 1994. The Trail Canyon Fire of 1999 burned over 106,500 acres of sagebrush and piñon-juniper vegetation types. Approximately 3,000 to 4,000 acres of this fire burned in and around the Mine Plan Area. No wildlife has encroached in to the Mine Plan Area. Rehabilitation work was conducted following the Trail Canyon fire,

including soil stabilization and revegetation treatments. The Trail Canyon fire was considered a high-severity wildfire and uncharacteristic of typical wildfires in these fuel types. An additional 2,084 acres burned in and around the Mine Plan Area since 1994 as a result of the other wildland fires. The average acres burned per fire was 347.

4.3 Present Actions

Present actions include livestock grazing, range improvement projects, dispersed recreation, fire fuels treatments rehabilitation, and mining activities that include exploration and closure/reclamation of the Tonkin Springs Mine. Current range improvement projects are construction of two fences and improvements to nine springs. Fire fuels treatments include the Red Hills and the Tonkin projects, which are included in Chapter 3. The Red Hills Unit includes 3,671 acres, 2,200 to 3,037 acres of which will be treated. The Tonkin Unit encompasses 2,400 acres, of which up to 1,000 acres will be treated.

4.4 Reasonably Foreseeable Future Actions

The reasonably foreseeable future actions (RFFAs) within the CESAs include the following: continued livestock grazing; dispersed recreation; fire fuels treatments; fire rehabilitation; and mining activities. Wild horse gathers will be completed in order to remove excess wild horses and apply fertility control to mares in order to reduce population growth rates. In addition, the BLM proposes to thin piñon-juniper woodlands on approximately 3,000 acres of the Willow Creek drainage of the northern Roberts Mountains to enhance wildlife habitat. This project is within the JD Allotment, approximately 30 miles northwest of Eureka, Nevada. The trees would be thinned by crews using chainsaws and would be conducted over a period of several years as time and resources allow.

Wildland fires are also likely to occur within the CESA in the next ten years. Mineral exploration activities are expected to continue based on current supply and demand of minerals and commodities. Livestock grazing and recreational activities are expected to continue consistent with the present actions discussed.

4.5 Cumulative Impacts

In accordance with the guidance document, "Considering Cumulative Effects Under the National Environmental Policy Act" (CEQ, 1997), the potential cumulative impacts to the CESA for all of the resources presented and evaluated in Chapter 4, are discussed below.

4.5.1 Air Quality

Past actions that have had direct and temporary impacts to air quality, specifically particulate levels from fugitive dust, include mining operations, mineral exploration, grazing, wild horses, wildfires, and recreation (especially off-road vehicle use). The sources of fugitive dust are typically from any surface disturbance by either animal or man. Wind then erodes the disturbed soils and disperses the dust and debris. In the case of mineral exploration and development, the sources of fugitive dust included clearing, earth moving, drilling, and wind erosion from waste rock dumps and growth media stockpiles.

Direct and temporary impacts to past air quality relating to gaseous pollutants included mineral exploration and recreation from equipment exhaust emissions, including mobile equipment and light vehicles. In addition, the Tonkin Springs Mine may have temporarily contributed chemical vapor emissions during the beneficiation of ores while the mine was is operation. These sources would have impacted air quality within the CESA.

Present actions affecting air quality through either fugitive dust or gaseous emissions include the activities identified above, including exploration activities occurring within the Mine Plan Area.

Fugitive dust and vehicular combustion engine emissions associated with mineral exploration and development, dispersed recreation [(e.g., off highway vehicle (OHV)], and fire fuels treatments/fire rehabilitation is likely within the next two to three years. These types of operations would have direct and temporary, effects on air quality that would be limited in duration to the life of the operations. Expectations are that the present activities described above would also continue into the future.

Cumulative impacts to air resources within the CESA would result from the present actions, and RFFAs when combined with the construction-associated activities of the Proposed Action. However, air pollutant emissions created by most of these actions would be regulated by the NDEP Bureau of Air Pollution Control, and air resource impacts would be reduced to levels that are consistent with the ambient air quality standards. Additionally, impacts to air resources from the Proposed Action would be minimized due to implementation of Environmental Protection Measures and BMPs.

4.5.2 Noxious Weeds, Invasive and Non-Native Species

Past actions that have had effects on the occurrence and spread of noxious weeds, invasive and non-native species include mining, mineral exploration, livestock and wild horse grazing, and any other activities that involved the disturbance of surface soils and vegetation enough to allow for the establishment of invasive, non-native species. This would also include the use of recreational, off-road vehicles that can not only create surface disturbance, but can transport noxious weeds, invasive and non-native species into the area. Historically, these 'spreading' activities have been completely unregulated activities. Spread of cheatgrass, an invasive species is associated with wildland fires.

The present actions that are affecting the establishment of noxious weeds, invasive and non-native species are the same as the past actions, including exploration activities being conducted by various operators under the approved plans and notices (**Table 4-1**). In addition, the gathering and removal of livestock and wild horses from the CESA would likely have had the beneficial result of reducing the establishment of invasive, non-native species by reducing seed transport and localized disturbance. Approximately 1,225 acres of disturbance have been approved for mineral activities in the CESA. Surveys of the region have confirmed the presence of whitetop, Russian and spotted knapweeds, musk thistle, salt cedar, and perennial pepperweed (though not in the TSLLC Mine Plan Area). Expectations are that the present activities described above would also continue into the future.

Potential impacts from noxious weeds, invasive and non-native species as a result of mining (including mine reclamation activities as outlined under the Proposed Action), mineral exploration, grazing, dispersed recreation, or loss of native vegetation associated with potential wildland fires could occur in the future. The Proposed Action would create no additional disturbance. These impacts would be localized and minimized due to implementation of Environmental Protection Measures and BMPs. Therefore, impacts from invasive, non-native species as a result of the Proposed Action in combination with the past and present actions and RFFAs would be minimal.

4.5.3 Water Quality – Drinking, Surface and Groundwater

There are no designated drinking water resources identified within the TSLLC Mine Plan Area. However, the nearby Tonkin Reservoir and Denay Creek have been designated as potential municipal water sources (NAC 445A.1512, .1514, and .1516). There is also a potable water well located at the Tonkin Springs Mine man camp. Regardless, no cumulative impacts to drinking water are expected to occur.

Past actions that could impact water resources (surface water and groundwater) would have included mining activities, grazing, dispersed recreation, fire fuels treatments, and wildland fire suppression

efforts that introduced sediment to ephemeral streams or springs or that consumed water within the immediate watershed. There are no specific data that quantify the amount of sedimentation.

A total of 1,225 acres of disturbance are approved for mineral activities. Some of this disturbance has been reclaimed or has naturally stabilized and revegetated over the years, thereby limiting the amount of sedimentation generated by this disturbance.

Potential impacts to water quality [based on Nevada Beneficial Use Standards for the designated waters in the area, including livestock grazing, aquatic habitat, irrigation, municipal/industrial supply, contact and non-contact recreation, and wildlife propagation] could result from mining activities (including mine reclamation activities as outlined under the Proposed Action), grazing, or dispersed recreation in the future. There are no specific data on the amount of sedimentation or water quality impacts that could result from these activities. However, mining operations would be required to have spill prevention plans, stormwater pollution prevention plans, handle hazardous substances in accordance with NDOT and MSHA, adhere to NAC 534.4369 and 534.4371, implement Environmental Protection Measures, and utilize BMPs, thus minimizing potential impacts to water quality and beneficial uses. Based on the above analysis and findings from Chapter 3, impacts to water quality from the Proposed Action in combination with the past and present actions and RFFAs would be negligible.

4.5.4 Fire Management

Past actions that could have resulted in impacts to fire management within the CESA include mineral exploration and mining operations, grazing, fuels reduction activities, wildland fire, fire suppression activities, and dispersed recreation.

Present actions that may result in impacts to fire management within the CESA are the same as the past actions, including the current fuels reduction projects and current mineral exploration and development activities being conducted within the CESA. At this time, the Red Hills Unit and the Tonkin Unit are currently authorized for the treatment of hazardous fuels, and approximately 1,225 acres are approved for disturbance by mineral exploration and development in the CESA.

RFFAs that may result in impacts to fire management in the CESA include mineral exploration and mining operations, grazing, wildland fire, and fuels reduction activities. The Red Hills Hazardous Fuels Reduction Project (NV-064-2823-JM-JF28) is an ongoing hazardous fuels reduction project in authority for hazardous reduction projects (516 DM 2, Appendix 1, 1.12.) and is in conformance with the RMP, amended for Fire Management in 2002, as well as the Fire Land Use Plan Amendment and Decision Record (NV61-EA97-071) which was approved on September 17, 2002. This Project is also in compliance with the BMD Fire Management Plan approved September 30, 2004.

The Red Hills Unit encompasses 3,671 acres. Broadcast prescribed fire would be conducted on 1,700 to 2,537 acres (46 to 70 percent of the Red Hills Unit). Up to 100 acres would be treated by pile and/or slash burning and up to 400 acres would be treated utilizing mechanical methods. The purpose of this action is to reduce hazardous fuel accumulations in the Red Hills/Tonkin Springs area of Eureka County, Nevada. In addition to hazardous fuels reduction, secondary benefits of the project would be to protect and improve wildlife habitat in the long term, particularly sage-grouse habitat, and to reintroduce fire under prescribed conditions into this fire-dependent ecosystem. The Red Hills Maximum Manageable Area (MMA) and the Red Hills Unit are in the vicinity of the Mine Plan Area within the CESA.

The Tonkin Unit encompasses 2,400 acres, of which up to 1,000 acres would be treated for hazardous fuels. Although these actions are currently authorized, there have been very few hazardous fuels reduction activities within this Unit in recent years.

There is potential for impacts to fire management within the CESA as a result of the past and present actions and RFFAs when combined with the Proposed Action. However, cumulative impacts to fire management would be limited due to the implementation of Environmental Protection Measures, BMP's, and ongoing hazardous fuels reduction projects. Based on the above analysis and findings from Chapter 3, impacts to fire management from the Proposed Action in combination with the past and present actions and RFFAs would be negligible.

4.5.5 Wildlife (Including Special Status Species and Migratory Birds)

Past actions that have had effects on wildlife include livestock grazing, mineral exploration and mining, water developments/range improvements, dispersed recreation, and wildfires. While most result in the degradation of suitable habitat for wildlife, threatened and endangered species, and migratory birds, wildfires have an added long-term benefit of creating new forage and habitat for some animals following reseeding and reclamation activities although with a concomitant temporary short-term decrease in habitat and forage. Fire treatments would have reduced the impacts to wildlife compared to a wildland fire.

The present actions that may be affecting wildlife and TES species are the same as the past actions, including the current mineral exploration and development activities being conducted within the CESA. Approximately 1,225 acres are approved for disturbance by mineral exploration and development in the CESA. Reclamation has been, or will be performed on much of the exploration projects, which has resulted in early stages of vegetation reestablishment and habitat restoration. Greater sage-grouse, migratory birds, and other special status species could also occur in the CESA and may have been impacted by past and present actions and loss of habitat due to fire. Impacts of present actions on greater sage-grouse as well as migratory birds are monitored and evaluated in the form of surveys to detect their presence and allow for mitigation through avoidance.

Potential impacts to wildlife from grazing, piñon-juniper thinning, dispersed recreation, or loss of habitat associated with potential wildland fires could occur in the future. In addition, noise from these activities could affect wildlife. There are no specific data on the potential impacts to habitat from grazing, dispersed recreation, or wildland fires. Impacts to wildlife from the Proposed Action would generally be beneficial (reestablishment of vegetative cover and sage brush habitat) but may have short-term negative effects from noise disturbance associated with project activities. These impacts would be localized and minimized due to implementation of BMPs.

The Proposed Action would not create additional disturbance. No cumulative impacts to listed threatened or endangered species would occur as these species do not occur within the Mine Plan Area. Impacts to special status species or their habitat from the Proposed Action in combination with the past and present actions and RFFAs would be negligible or cumulatively beneficial.

4.5.6 Cultural Resources

Past actions that could have resulted in impacts to cultural resources within the CESA include mineral exploration and mining operations, grazing, fuels reduction activities, wildland fires, fire suppression activities, and dispersed recreation. As discussed in Chapter 3, ten Class III cultural resource surveys were conducted within and around the Mine Plan Area prior to 2006 and most of the Mine Plan Area has been disturbed, so any cultural resources that may have been located within the Mine Plan Area have already been mitigated.

Present actions that may result in impacts to cultural resources within the CESA are the same as the past actions, including the current fuels reduction projects and current mineral exploration and development activities being conducted within the CESA. At this time, approximately 1,225 acres are approved for disturbance by mineral exploration and development in the CESA.

RFFAs that may result in impacts to cultural resources within the CESA include mineral exploration and mining activities, dispersed recreation, fuel reduction activities, and wildland fire suppression efforts.

Although the Proposed Action would not create additional disturbance, there is potential for impacts to cultural resources within the CESA as a result of the past, present, and RFFAs when combined with the Proposed Action. However, cumulative impacts to cultural resources would be limited due to implementation of Environmental Protection Measures and BMP's. Based on the above analysis and findings from Chapter 3, impacts to cultural resources from the Proposed Action in combination with the past and present actions and RFFAs would be negligible.

4.5.7 Native American Religious Concerns

Past actions that could have resulted in impacts to Native American religious concerns within the CESA include mineral exploration and mining operations, grazing, fuels reduction activities, wildland fire and fire suppression activities, and dispersed recreation.

Present actions that may result in impacts to Native American religious concerns within the CESA are the same as the past actions, including current mineral exploration and development activities being conducted within the CESA. At this time, approximately 1,225 acres are approved for disturbance by mineral exploration and development in the CESA.

RFFAs that may result in impacts to Native American religious concerns within the CESA include mineral exploration and mining activities, dispersed recreation, fuel reduction activities, and wildland fire suppression efforts.

Although the Proposed Action would not create additional disturbance, there is potential for impacts to Native American religious concerns within the CESA as a result of the past and present actions, and RFFAs when combined with the Proposed Action. However, cumulative impacts to Native American religious concerns would be limited due to implementation BMP's and guidance solicited from the tribes. Based on the above analysis and findings from Chapter 3, impacts to Native American religious concerns from the Proposed Action in combination with the past and present actions and RFFAs would be negligible.

4.5.8 Waste, Hazardous and Solid

Past actions that could have resulted in the production of wastes within the CESA include mineral exploration and mining operations, wildland fire suppression, and dispersed recreation.

Present actions that may result in the production of wastes within the CESA are the same as the past actions, including the current mineral exploration and development activities being conducted within the CESA. At this time, approximately 1,225 acres are approved for disturbance by mineral exploration and development in the CESA.

RFFAs that may result in the production of wastes within the CESA include mineral exploration and mining activities, dispersed recreation, fuel reduction activities, and wildland fire suppression efforts.

There is potential for the creation of wastes within the CESA as a result of the past and present actions and RFFAs when combined with the Proposed Action. However, cumulative impacts from hazardous and solid wastes would be limited due to implementation of the Environmental Protection Measures and BMP's. Based on the above analysis and findings from Chapter 3, impacts from hazardous wastes as a result of the Proposed Action in combination with the past and present actions and RFFAs would be negligible.

4.5.9 Grazing Management

The CESA for grazing management is the JD and Grass Valley allotments, which encompass 435,427 acres. Past actions that could have had an impact on grazing resources include mineral exploration and mining operations, grazing by livestock, rangeland improvements, wildland fires and fire treatments, and dispersed recreation.

Present actions that may result in impacts to grazing management resources are the same as the past actions, including the current mineral exploration and development activities being conducted within the CESA. At this time, approximately 1,225 acres are approved for disturbance by mineral exploration and development in the CESA. Wildland fires and ongoing fire treatment could also result in temporary loss of forage; however, revegetation following fires or their treatments could result in an increase in herbaceous species, or forage. Also, reclamation has been performed on a majority of the past and present exploration disturbance, resulting in early stages of the reestablishment of forage vegetation.

RFFAs that may result in impacts to rangeland resources include mineral exploration and mining activities, grazing, piñon-juniper thinning in the Roberts Mountains, dispersed recreation, fuel reduction activities, wildland fire, and rangeland improvements. The piñon-juniper thinning is intended to improve wildlife habitat, which should also have benefits on the rangelands, and improve forage for livestock grazing. As a result of the Proposed Action, the decision to remove the four-strand, barbed-wire livestock perimeter fence would be made after reclamation standards have been met. If it is determined that this fence should be removed at this time, then grazing by livestock and wild horses would resume in the Mine Plan Area.

Although the Proposed Action would not create additional disturbance, there is potential for impacts to grazing resources as a result of the past and present actions and RFFAs when combined with the Proposed Action. However, based on the above analysis and findings from Chapter 3, cumulative impacts to grazing resources from the Proposed Action in combination with the past and present actions and RFFAs would be negligible.

4.5.10 Vegetation

The CESA for vegetation resources encompasses the two immediate watersheds for a total of 49,950 acres. Past actions that could have impacted vegetation include mineral exploration, mining activities, grazing, rangeland improvements, wildland fires and fuel treatments, and dispersed recreation that utilized, impacted, or reduced vegetation. Reclamation has been performed on a majority of the exploration projects and fire rehabilitation projects have been implemented, which has resulted in early stages of vegetation reestablishment and habitat restoration.

Present actions that may result in impacts to vegetation resources are the same as the past actions, including the current mineral exploration and development activities being conducted within the CESA. At this time, approximately 1,225 acres (or 2.5% of the CESA) are approved for disturbance by mineral exploration and development in the CESA. Wildland fires and ongoing fire treatment could also result in temporary loss of forage; however, revegetation following fires or their treatments could result in an increase in herbaceous species, or forage.

RFFAs that may result in impacts to vegetation resources include grazing, piñon-juniper thinning in the Roberts Mountains, dispersed recreation, mining and exploration activities, fuel reduction treatments, or wildland fire. As a result of the Proposed Action, the decision to remove the four-strand, barbed-wire livestock perimeter fence would be made after reclamation standards have been met. If it is determined that this fence should be removed at this time, then grazing by livestock and wild horses would resume and the Mine Plan Area would be opened to OHV usage.

Although the Proposed Action would not create additional disturbance, there is potential for impacts to vegetation as a result of the past and present actions, and RFFAs when combined with the Proposed Action. The potential for cumulative impacts to vegetation would be limited due to the implementation of BMPs. Based on the above analysis and findings from Chapter 3, cumulative impacts to vegetation resources from the Proposed Action in combination with the past and present actions and RFFAs would be negligible.

4.5.11 Visual Resources

Past actions that could have impacted visual resources include mining and exploration activities, dispersed recreation, fuel reduction activities, wildland fires, fire suppression activities, and fire rehabilitation. These activities could have had impacts to visual resources within the CESA by altering the characteristics of line, form, color, and texture.

Present actions that may result in impacts to visual resources are the same as the past actions, including the current mineral exploration and development activities being conducted within the CESA. At this time, approximately 1,225 acres are approved for disturbance by mineral exploration and development in the CESA.

RFFAs that may result in impacts to visual resources include grazing, piñon-juniper thinning in the Roberts Mountains, dispersed recreation, mining and exploration activities, fuel reduction activities, and wildland fire. These actions may have the potential to impact visual resources within the CESA by altering the characteristics of line, form, color, and texture. Impacts to visual resources as a result of the Proposed Action would be temporary and would occur during earth moving activities associated with reclamation of the mine facilities. Impacts to visual resources resulting from implementation of the Proposed Action are anticipated to be minimal and are in conformance with the objectives of VRM Class IV objectives.

Although the Proposed Action would not create additional disturbance, there is potential for impacts to visual resources as a result of the past and present actions and RFFAs when combined with the Proposed Action. All of the past and present actions, RFFAs, as well as the Proposed Action are in keeping with the Class IV VRM designation. Additionally, cumulative impacts to visual resources would be limited due to the implementation of BMPs. Based on the above analysis and findings from Chapter 3, impacts to visual resources from the Proposed Action in combination with the past and present actions and RFFAs would be negligible.

4.5.12 Wild Horses

The CESA for wild horses is the JD and Grass Valley allotments, which encompass 435,427 acres. Past actions that could have had an impact on wild horses include mineral exploration and mining activities, grazing, rangeland improvements, fuel reduction activities, wildland fires, dispersed recreation, and wild horse gathers.

Present actions that may result in impacts to wild horses are the same as the past actions, including the current mineral exploration and development activities being conducted within the CESA. At this time, approximately 1,225 acres are approved for disturbance by mineral exploration and development in the CESA.

Past and present activities could result in the fragmentation of wild horse habitat and impact the quality and quantity of habitat available to wild horses. Additionally, the Rocky Hills HMA is small, and has a large number of fences within its boundaries in proportion to its size. These fences have restricted free movement within the HMA and have prevented the HMA from being utilized uniformly.

RFFAs that may result in impacts to wild horses include impacts from grazing, piñon-juniper thinning in the Roberts Mountains, dispersed recreation, mining activities, fuel reduction activities, wildland fires, and wild horse gathers. In addition, noise from dispersed recreation or mining and reclamation activities could affect wild horse herds. The piñon-juniper thinning is intended to improve wildlife habitat, which should also improve forage for grazing by wild horses. As a result of the Proposed Action, the decision to remove the four-strand, barbed-wire livestock fence would be made after reclamation standards have been met. If it is determined that this fence should be removed at this time, then the restrictive effects on the movement of livestock and wild horses in the area would be eliminated.

Although the Proposed Action would not create additional disturbance, the past and present actions and RFFAs when combined with the Proposed Action could impact wild horse distribution and seasonal movement throughout and between HMAs. Each activity results in incremental restrictions on free roaming behavior and over time may influence utilization patterns, genetic interchange and use of water sources. The potential for cumulative impacts to wild horses would be limited through the implementation of Environmental Protection Measures and BMPs. Based on the above analysis and findings from Chapter 3, cumulative impacts to wild horses from the Proposed Action in combination with the past and present actions and RFFAs would be negligible.

4.5.13 Wetlands and Riparian Zones

The CESA for wetlands and riparian zones is the immediate sub-watersheds (Upper Denay Creek and Jackass-Coils Creek) which, when combined, encompass 49,950 acres. Past actions that could have had impacts to wetlands and riparian zones would include mining activities, grazing, range improvements, wildland fires, fire suppression activities, and road encroachment.

Present actions that may result in impacts to wetlands and riparian zones are the same as past actions, including the current mineral exploration and development activities being conducted within the CESA. At this time, approximately 1,225 acres are approved for disturbance by mineral exploration and development in the CESA, however, the present activities have been designed to avoid wetlands and minimize disturbance to riparian areas through the use of BMPs. In addition, vegetative cover has increased due to reclamation on a majority of the exploration projects as well as fire rehabilitation, both of which have reduced erosion and sedimentation that may have impacted wetlands or riparian zones.

RFFAs that may result in impacts to wetlands and riparian zones include impacts from mineral exploration, mining activities, grazing, rangeland improvements, wildland fires, fuels reduction activities, and dispersed recreation.

Although the Proposed Action would not create additional disturbance, the past and present actions and RFFAs when combined with the Proposed Action could impact wetlands and riparian zones. The cumulative impacts to wetlands and riparian zones would be limited through the implementation of BMPs. Based on the above analysis and findings from Chapter 3, cumulative impacts to wetlands and riparian zones would be minimal.

4.5.14 Geology and Minerals

Past actions that could have impacts to geology and mineral resources include mineral exploration activities and mining. Present actions that may result in impacts to geology and minerals are the same as the past actions, but include the current mineral exploration and development activities being conducted within the CESA. At this time, approximately 1,225 acres are approved for disturbance by mineral exploration and development in the CESA.

RFFAs that may result in impacts to geology and mineral resources include impacts from mineral exploration and mining activities. As a result of the Proposed Action, backfilling of the TSP-1 Pit may hinder future access to known mineral resources by requiring the re-handling of material from the pit.

Although the Proposed Action would not create additional disturbance, there is potential for impacts to geology and mineral resources as a result of the past, present, and RFFAs when combined with the Proposed Action. However, based on the above analysis and findings from Chapter 3, cumulative impacts to geology and mineral resources would be negligible.

4.6 No Action Alternative

The combined impacts of the No-Action Alternative, past and present actions, and other RFFAs would be similar to those identified for the Proposed Action for the aforementioned resources, as the reclamation activities would be the same.

4.7 Irreversible and Irretrievable Commitment of Resources

No irreversible and irretrievable commitment of resources is expected.

5.0 Mitigation and Monitoring

5.1 Proposed Mitigation

Mitigation and monitoring for migratory birds, raptors, and sage-grouse may be necessary to comply with the Migratory Bird Treaty Act, the Bald and Golden Eagle Act, and BLM sage-grouse conservation.

There are no old adits, shafts or other structures with potential bat roost sites within the immediate area of the Proposed Action. No mitigation for bats is, therefore, currently warranted.

5.2 Proposed Monitoring

The decision to remove the existing four-strand barbed-wire livestock perimeter fence will be made after reclamation standards have been met. For reclamation standards to be met, disturbed areas within the Mine Plan Area must be successfully revegetated. Successful vegetation reclamation standards include:

1. Cover of native plants on revegetated disturbed sites should equal cover on undisturbed sites that occur within the perimeter fence on the same ecological site;
2. Production of native plants on revegetated disturbed sites should equal production on undisturbed sites that occur within the perimeter fence on the same ecological site; and
3. Attainment of both the above standards must be met for at least two years immediately prior to perimeter fence removal.

6.0 Consultation and Coordination

The scope of this EA was developed through consultation with BLM resource specialists (meetings and subsequent conversations); consultation with other local, state, and federal agency resource personnel; review of project proponent and agency files; field reconnaissance; and review of supporting documentation.

6.1 List of Preparers

6.1.1 U.S. Bureau of Land Management - Mount Lewis Field Office

Christopher Cook	Field Manager
Andrea Dolbear	Project Manager, Env. Protection Specialist
Ethan Ellsworth	Wildlife Biologist (incl. T&E/Sensitive Species, Migratory Birds)
Chris Worthington	Planning/Environmental Coordinator
Kat Russell	Archaeologist/Cultural Resources
Kent Bloomer	Weed Management Specialist
Alden Shallcross	Hydrologist/Water Resources/Riparian
Shawna Richardson	Wild Horses
Christopher Herr	Range Management Specialist
Ethan Arky	Outdoor Recreation Planner

6.1.2 SRK Consulting (U.S.), Inc.

Katie (Dean) Bertrando	Project Manager
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Dave Dixon	GIS Technician
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6.2 Persons, Groups, or Agencies Consulted

The following persons, groups, and agencies were contacted during the preparation of this document.

6.2.1 Nevada Natural Heritage Program

Eric S. Miskow	Biologist/Data Manager

6.2.2 U.S. Fish & Wildlife Service

Edward D. Koch	State Supervisor

6.2.3 Nevada Department of Wildlife

Timothy Herrick	Conservation Aide III

6.2.4 Tonkin Springs LLC

Jim Smithson	Environmental Manager
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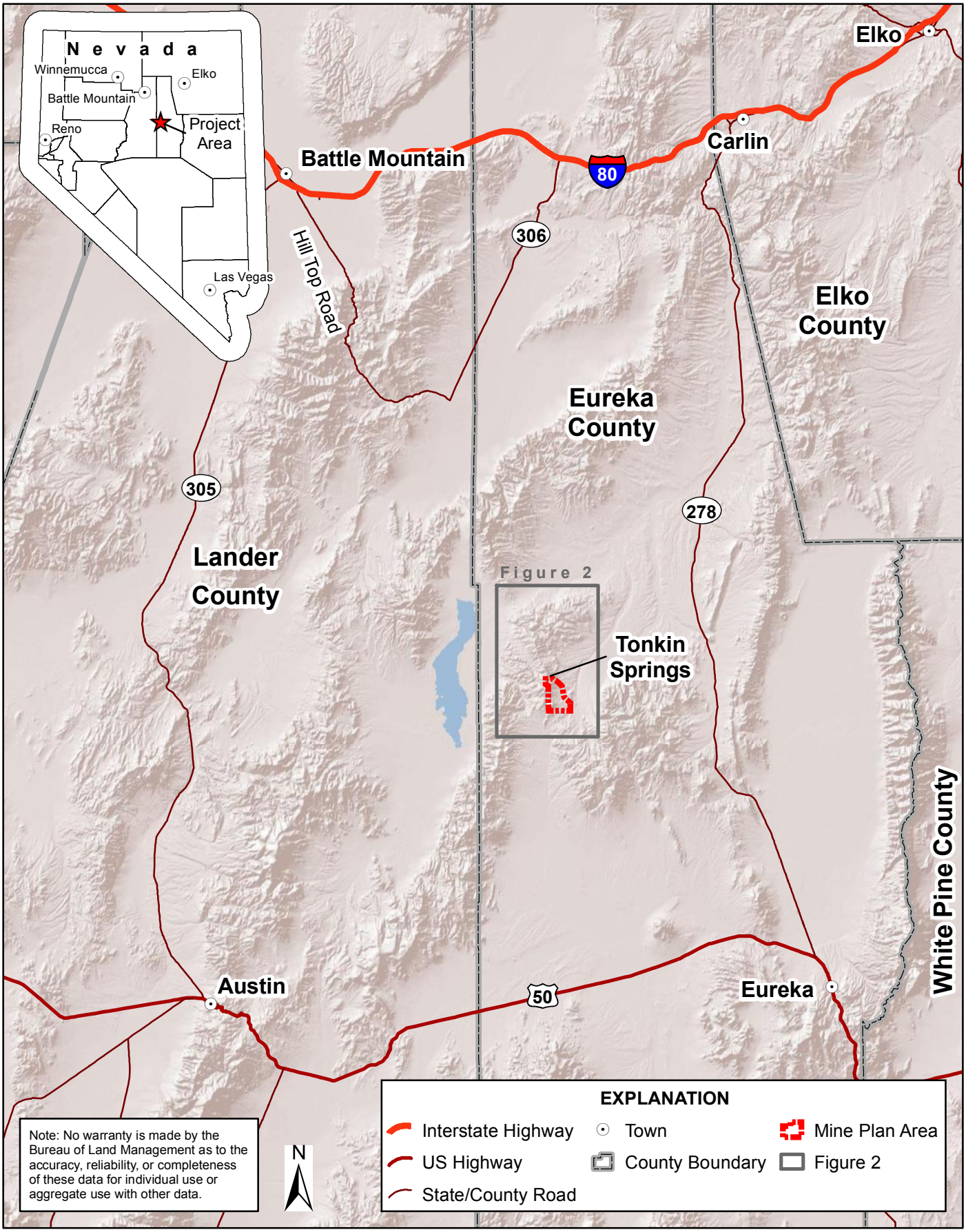
The following federal statutes were reviewed during the preparation of this environmental assessment:

- American Indian Religious Freedom Act 1978 (42 U.S.C. 1996)
- Clean Water Act of 1977 (33 U.S.C. 1251 *et seq*.)
- Clean Air Act as amended (42 U.S.C. 7401 *et seq*.)
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended (42 U.S.C. 9615)
- Endangered Species Act of 1973 as amended (16 U.S.C. 1531)

- Executive Order 11988, as amended, Floodplain Management. May 24, 1977.
- Executive Order 11990, Protection of Wetlands. May 24, 1977.
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. February 11, 1994.
- Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds. January 10, 2001.
- Federal Land Policy and Management Act of 1976. (43 U.S.C. 1701 *et seq*.)
- National Historic Preservation Act as amended (16 U.S.C. 470)
- Public Rangelands Improvement Act of 1978
- Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6901 *et seq*.)
- Safe Drinking Water Act as amended (42 U.S.C. 300f et seq.)
- Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 *et seq*.)
- Wild and Scenic Rivers Act as amended (16 U.S.C. 1271)
- Wilderness Act of 1964 (16 U.S.C. 1131 *et seq*.)

Figures



Battle Mountain
BLM District
Mount Lewis Field Office

NAD 1983 UTM Zone 11N

SCALE: NOT TO SCALE

TONKIN SPRINGS CLOSURE PLAN ENVIRONMENTAL ASSESSMENT

DRAWING TITLE:
LOCATION MAP

DRAWING NO. FIGURE 1

REVISION NO. A

DATE: 4/11/2014

PATH: G:\Sites_Reno\Tonkin_Springs\162200_330_EA\EA_162200_330_Fig01_Location_Map_BVB_20130104.mxd

Figure 3

EXPLANATION

- Fence
- Mine Plan Area
- Public
- Private
- Figure 3

Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

Feet

0 5,000

Battle Mountain
BLM District
Mount Lewis Field Office

NAD 1983 UTM Zone 11N

SCALE: 1 inch = 5,000 feet

TONKIN SPRINGS CLOSURE PLAN ENVIRONMENTAL ASSESSMENT

DRAWING TITLE:
PROJECT BOUNDARY

DRAWING NO. **FIGURE 2**

REVISION NO. **A**

DATE: **4/11/2014**

PATH: G:\Sites_Reno\Tonkin_Springs\162200_330_EA\EA_162200_330_Fig02_Project_Boundary_BVB_20130104.mxd

Figure 4

Mine Plan Area
3,000 Acres

EXPLANATION

- Fence
- Pipeline
- Existing Pipeline
- Facilities
- Mine Plan Area
- Figure 4
- Event Pond
- Heap Leach Pad
- Ore Stockpile
- Pit
- Solid Waste Landfill
- Tailings Impoundment
- Topsoil Stockpile
- Waste Dump
- Yard

Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

Feet
0 2,000

Battle Mountain
BLM District
Mount Lewis Field Office

NAD 1983 UTM Zone 11N

SCALE: 1 inch = 2,065 feet

TONKIN SPRINGS CLOSURE PLAN ENVIRONMENTAL ASSESSMENT

DRAWING TITLE:
MINE PLAN AREA EXISTING DISTURBANCE

DRAWING NO. **FIGURE 3**
REVISION NO. **A**
DATE: **4/11/2014**

PATH: G:\Sites_Reno\Tonkin_Springs\162200_330_EA\EA_162200_330_Fig03_Mine_Plan_Area_BVB_20130104.mxd

EXPLANATION

- Fence
- Roads
- Current pH Adjustment System Pipeline
- Heap Effluent Collection Pipeline
- Former pH Adjustment System Contingency Pipeline
- Event Pond
- Heap Leach Pad
- Ore Stockpile
- Pit
- Solid Waste Landfill
- Tailings Impoundment
- Topsoil Stockpile
- Waste Dump
- Yard
- Mine Plan Area

Rooster Pit
Rooster WRD
TS-9
TS-7
TSP-5 Pit
TS-8
TS-6
TSP-5 WRD
Mine Plan Area
Fence
Solid Waste Landfill
TSP-1 WRD
TS-4
Event Pond
Proposed Evaporation Ponds
TSP-4 WRD
TS-11
Heap Leach Pad
TS-10
TSP-1 Pit
TS-3
TS-1
TSP-4 Pit
TSP-7 Pit
TSP-6W Pit
TSP-2
TS-2
TSP-6E Pit
A
B
C
TS-13
Ore Stockpiles
D
Tailings Storage Facility
TSP-3 Pit
TS-12
TSP-3B WRD
Process Area
TSP-3A WRD

Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

Feet
0 1,000

Battle Mountain
BLM District
Mount Lewis Field Office

NAD 1983 UTM Zone 11N

SCALE: 1 inch = 1,995 feet

TONKIN SPRINGS CLOSURE PLAN ENVIRONMENTAL ASSESSMENT

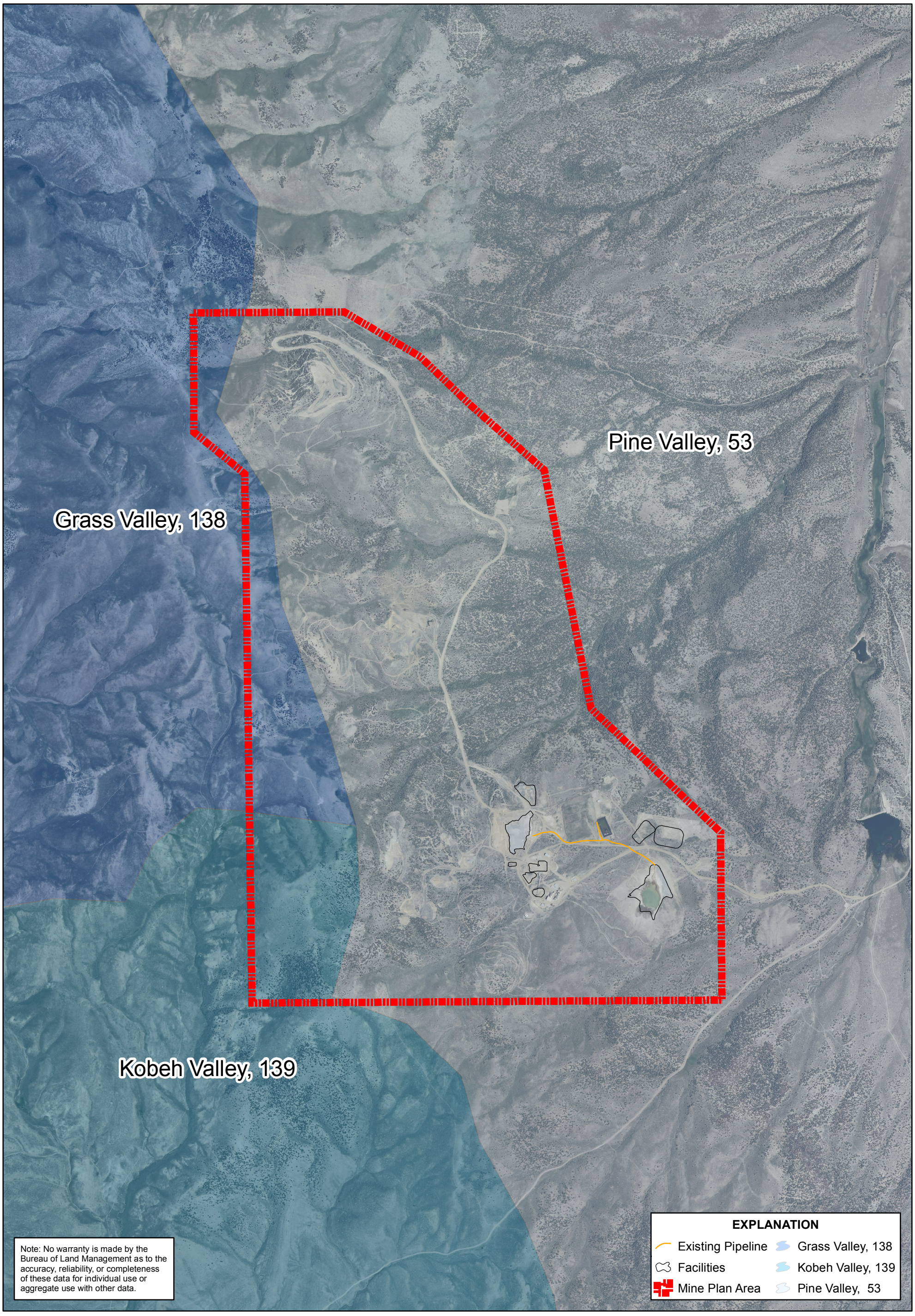
DRAWING TITLE:
PROPOSED ACTION EXISTING DISTURBANCE

DRAWING NO. **FIGURE 4**

REVISION NO. **A**

DATE: **4/11/2014**

PATH: G:\Sites_Reno\Tonkin_Springs\162200_330_EA\EA_162200_330_Fig04_Proposed_Action_BVB_20130104.mxd



N

Feet

0 2,000

Battle Mountain
BLM District
Mount Lewis Field Office

NAD 1983 UTM Zone 11N

SCALE: 1 inch = 2,064 feet

TONKIN SPRINGS CLOSURE PLAN ENVIRONMENTAL ASSESSMENT

DRAWING TITLE:
HYDROGRAPHIC SUB BASINS

DRAWING NO. **FIGURE 5**

REVISION NO. **A**

DATE: **4/11/2014**

PATH: G:\Sites_Reno\Tonkin_Springs\162200_330_EA\EA_162200_330_Fig05_Hydrographic_Sub_Basin_BVB_20130104.mxd

EXPLANATION

Plant Name, Genus/Species

- Musk Thistle, Carduus nutans
- Russian Knapweed, Acroptilon repens
- Areas of Musk Thistle (Carduus nutans)
- Existing Pipeline
- Facilities
- Mine Plan Area
- Public
- Private

Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

Feet

0 2,000

Battle Mountain
BLM District
Mount Lewis Field Office

NAD 1983 UTM Zone 11N

SCALE: 1 inch = 2,000 feet

TONKIN SPRINGS CLOSURE PLAN ENVIRONMENTAL ASSESSMENT

DRAWING TITLE:

INVASIVE, NON-NATIVE SPECIES INVENTORY

DRAWING NO. FIGURE 6

REVISION NO. A

DATE: 4/11/2014

PATH: G:\Sites_Reno\Tonkin_Springs\162200_330_EA\EA_162200_330_Fig06_Invasive_Nonnative_Inventory_BVB_20130104.mxd

Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

EXPLANATION

- Existing Pipeline
- Facilities
- Public
- Winter Range
- Private
- Mine Plan Area

N

Feet

0 4,000

Battle Mountain
BLM District
Mount Lewis Field Office

NAD 1983 UTM Zone 11N

SCALE: 1 inch = 4,000 feet

TONKIN SPRINGS CLOSURE PLAN ENVIRONMENTAL ASSESSMENT

DRAWING TITLE:
MULE DEER RANGE

DRAWING NO. FIGURE 7

REVISION NO. A

DATE: 4/11/2014

PATH: G:\Sites_Reno\Tonkin_Springs\162200_330_EA\EA_162200_330_Fig07_Mule_Deer_Range_BVB_20130104.mxd

Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

EXPLANATION

- Existing Pipeline
- Pronghorn Antelope Range
- Facilities
- Mine Plan Area

N

Feet

0 2,000

Battle Mountain
BLM District
Mount Lewis Field Office

NAD 1983 UTM Zone 11N

SCALE: 1 inch = 2,000 feet

TONKIN SPRINGS CLOSURE PLAN ENVIRONMENTAL ASSESSMENT

DRAWING TITLE:

PRONGHORN ANTELOPE RANGE

DRAWING NO. FIGURE 8

REVISION NO. A

DATE: 4/11/2014

PATH: G:\Sites_Reno\Tonkin_Springs\162200_330_EA\EA_162200_330_Fig08_Pronghorn_Antelope_Range_BVB_20130104.mxd

Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

EXPLANATION

- Existing Pipeline
- Facilities
- Rabbit Range
- Mine Plan Area

N

Feet

0 2,000

Battle Mountain
BLM District
Mount Lewis Field Office

NAD 1983 UTM Zone 11N

SCALE: 1 inch = 2,000 feet

TONKIN SPRINGS CLOSURE PLAN ENVIRONMENTAL ASSESSMENT

DRAWING TITLE:
PYGMY RABBIT RANGE

DRAWING NO. **FIGURE 9**

REVISION NO. **A**

DATE: **4/11/2014**

PATH: G:\Sites_Reno\Tonkin_Springs\162200_330_EA\EA_162200_330_Fig09_Rabbit_Range_BVB_20130104.mxd

Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

Sage-Grouse Distribution and LEK data supplied and maintained by Nevada Department of Wildlife (NDOW), obtained from BLM (http://www.blm.gov/nv/st/en/prog/more_programs/geographic_sciences/gis/geospatial_data.html).

EXPLANATION

LEK (Status)
- Active
- Unknown
- Existing Pipeline
- Facilities
- 4-Mile Limit
- Sage-Grouse Winter Distribution
- Sage-Grouse Late Summer Distribution
- Mine Plan Area

N

Feet

0 5,000

Battle Mountain
BLM District
Mount Lewis Field Office

NAD 1983 UTM Zone 11N

SCALE: 1 inch = 5,000 feet

TONKIN SPRINGS CLOSURE PLAN ENVIRONMENTAL ASSESSMENT

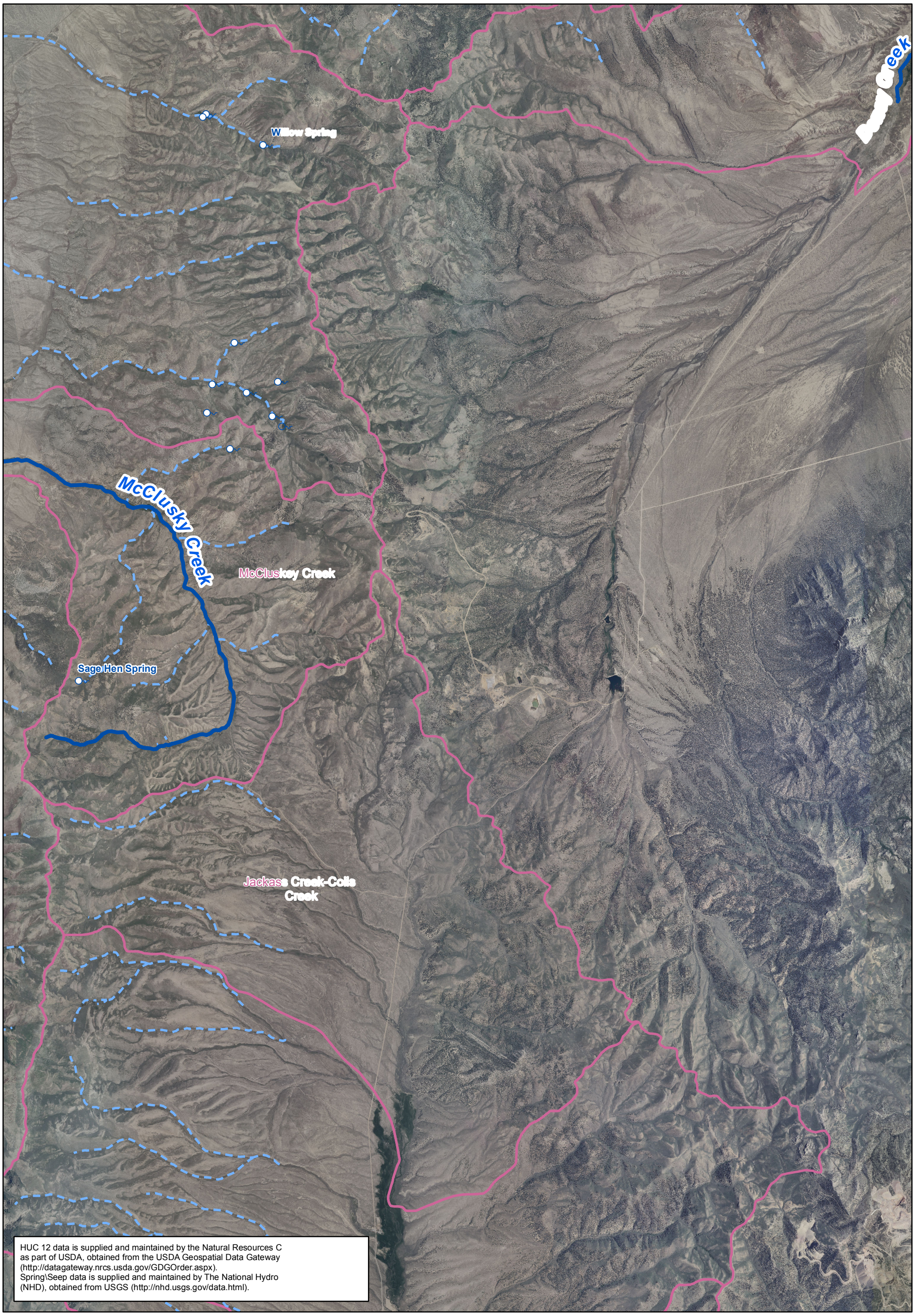
DRAWING TITLE: **GREATER SAGE-GROUSE RANGE**

DRAWING NO. **FIGURE 10**

REVISION NO. **A**

DATE: **4/11/2014**

PATH: G:\Sites_Reno\Tonkin_Springs\162200_330_EA\EA_162200_330_Fig10_Sage_Grouse_DRD_20130207.mxd



N

Feet

0 4,000

Battle Mountain
BLM District
Mount Lewis Field Office

NAD 1983 UTM Zone 11N

SCALE: 1 inch = 6,044 feet

TONKIN SPRINGS CLOSURE PLAN ENVIRONMENTAL ASSESSMENT

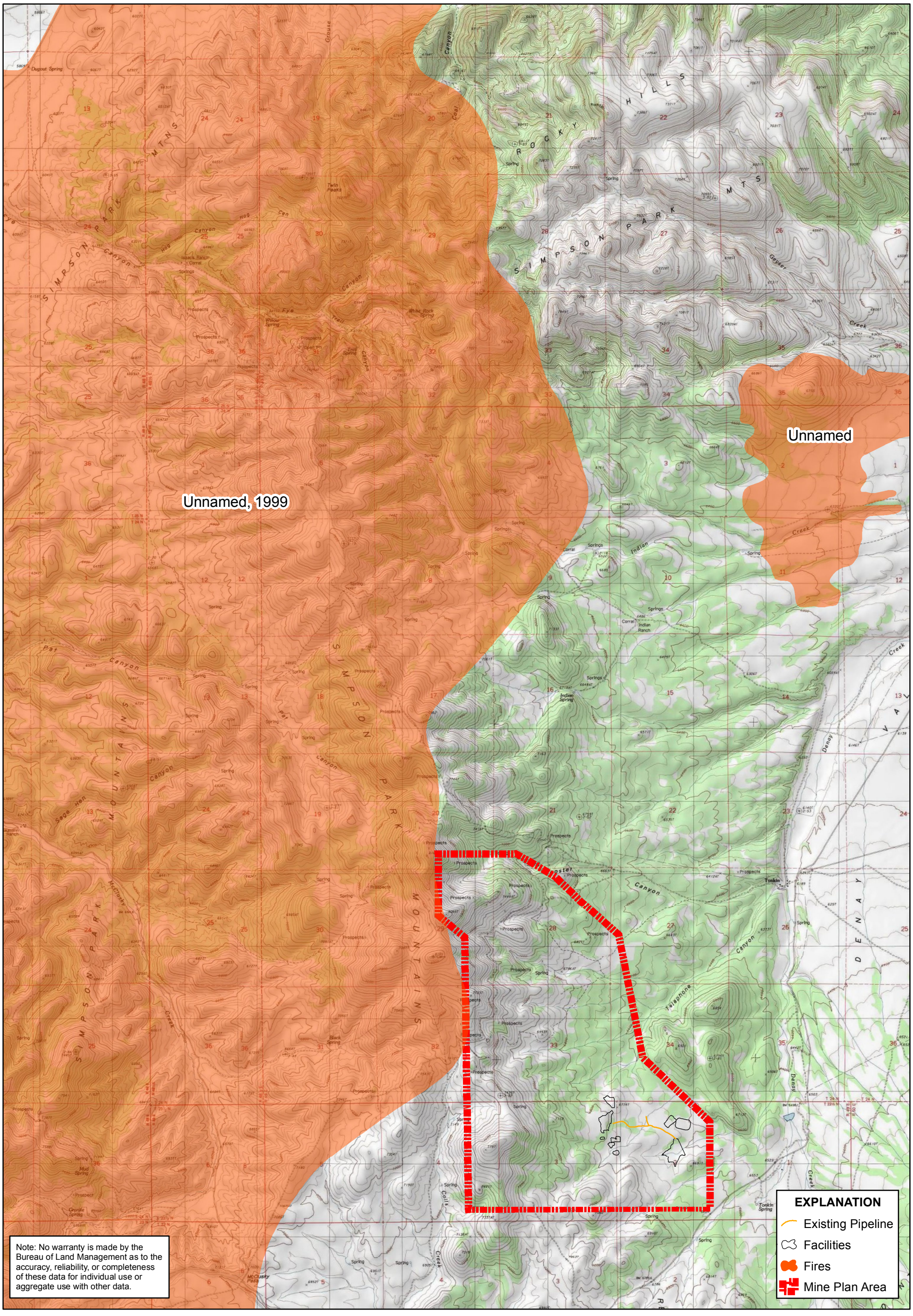
DRAWING TITLE: **SURFACE WATER**

DRAWING NO. **FIGURE 11**

REVISION NO. **A**

DATE: **4/11/2014**

PATH: G:\Sites_Reno\Tonkin_Springs\162200_330_EA\EA_162200_330_Fig11_Surface_Water_BVB_20130104.mxd



N

Feet
0 2,000

Battle Mountain
BLM District
Mount Lewis Field Office

NAD 1983 UTM Zone 11N

SCALE: 1 inch = 4,000 feet

TONKIN SPRINGS CLOSURE PLAN ENVIRONMENTAL ASSESSMENT

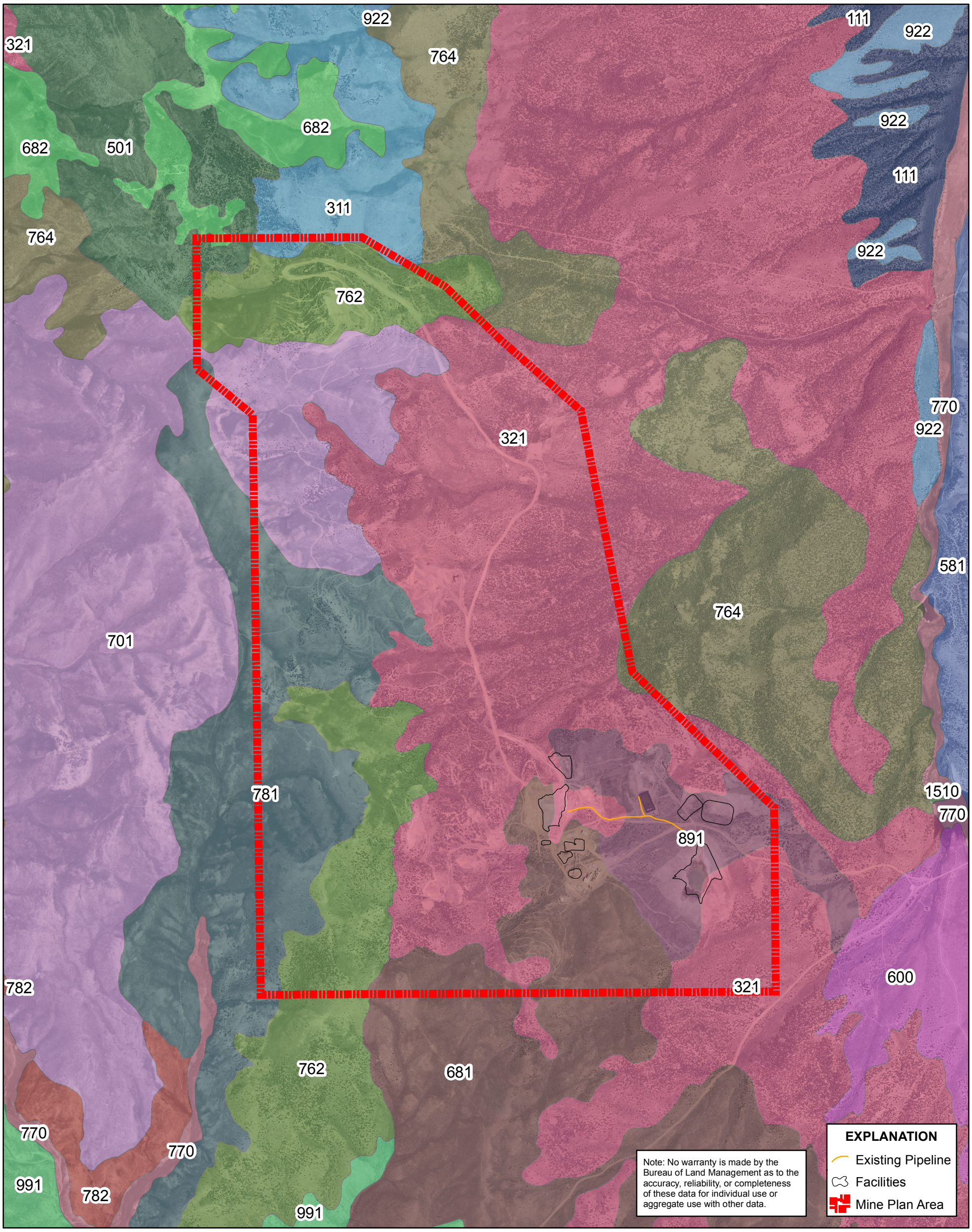
DRAWING TITLE: **FIRES**

DRAWING NO. **FIGURE 12**

REVISION NO. **A**

DATE: **4/11/2014**

PATH: G:\Sites_Reno\Tonkin_Springs\162200_330_EA\EA_162200_330_Fig12_Fires_DRD_20130725.mxd



Map Unit Name, Map Unit Number

- Chad-Cleavage-Softscrabble association, 681
- Chad-Gando-Softscrabble association, 682
- Eightmile-Loncan-Glean association, 311
- Fertaline-Handy association, 991
- Handy loam, 2 to 8 percent slopes, 922
- Hymas-Ansping association, 501
- Lien-Hayeston association, 111
- Loncan-Gando-Glean association, 701
- Mau-Shagnasty-Eightmile association, 321
- Rubyhill sandy loam, 0 to 4 percent slopes, 600
- Shagnasty-Ravenswood-Rock outcrop association, 764
- Shagnasty-Softscrabble association, 762
- Tomera loam, 4 to 8 percent slopes, 581
- Walti-Softscrabble-Chad association, 781
- Walti-Softscrabble-Robson association, 782
- Water, 1510
- Welch loam, drained, 0 to 4 percent slopes, 770
- Whitepeak-Quarz-Softscrabble association, 891

N

Feet

0 2,000

Battle Mountain
BLM District
Mount Lewis Field Office

NAD 1983 UTM Zone 11N

SCALE: 1 inch = 2,000 feet

TONKIN SPRINGS CLOSURE PLAN ENVIRONMENTAL ASSESSMENT

DRAWING TITLE: **SOIL MAP UNITS**

DRAWING NO. **FIGURE 13**

REVISION NO. **A**

DATE: **5/1/2014**

PATH: G:\Sites_Reno\Tonkin_Springs\162200_330_EA\EA_162200_330_Fig13_Soil_Map_Units_BVB_20130104.mxd

EXPLANATION

- Existing Pipeline
- Facilities
- Mine Plan Area

Wind Erodibility Group

- 1 Most Susceptible
- 2
- 3
- 4
- 4L
- 5
- 6
- 7
- 8 Least Susceptible
- Not rated or not available

Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

Feet

0 2,000

Battle Mountain
BLM District
Mount Lewis Field Office

NAD 1983 UTM Zone 11N

SCALE: 1 inch = 2,000 feet

TONKIN SPRINGS CLOSURE PLAN ENVIRONMENTAL ASSESSMENT

DRAWING TITLE:
SOIL EROSION POTENTIAL

DRAWING NO. **FIGURE 14**

REVISION NO. **A**

DATE: **5/1/2014**

PATH: G:\Sites_Reno\Tonkin_Springs\162200_330_EA\EA_162200_330_Fig14_Soil_Erosion_Potential_BVB_20130104.mxd

Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

EXPLANATION

- Existing Pipeline
- Facilities
- Mine Plan Area

Vegetative Landcover Type

- Great Basin Foothill and Lower Montane Riparian Woodland and Shrubland
- Great Basin Pinyon-Juniper Woodland - PJ Woodland
- Great Basin Xeric Mixed Sagebrush Shrubland - Mixed Sagebrush
- Inter-Mountain Basins Big Sagebrush Shrubland - Big Sagebrush
- Inter-Mountain Basins Cliff and Canyon
- Inter-Mountain Basins Greasewood Flat
- Inter-Mountain Basins Mixed Salt Desert Scrub
- Inter-Mountain Basins Montane Sagebrush Steppe - Sagebrush Steppe
- Inter-Mountain Basins Semi-Desert Grassland
- Inter-Mountain Basins Semi-Desert Shrub Steppe
- Invasive Annual and Biennial Forbland
- Invasive Annual Grassland
- Invasive Perennial Grassland
- North American Arid West Emergent Marsh
- Open Water

N

Feet

0 2,000

Battle Mountain
BLM District
Mount Lewis Field Office

NAD 1983 UTM Zone 11N

SCALE: 1 inch = 2,000 feet

TONKIN SPRINGS CLOSURE PLAN ENVIRONMENTAL ASSESSMENT

DRAWING TITLE: **VEGETATIVE COVER TYPE**

DRAWING NO. **FIGURE 15**

REVISION NO. **A**

DATE: **5/1/2014**

PATH: G:\Sites_Reno\Tonkin_Springs\162200_330_EA\EA_162200_330_Fig15_Vegetation_BVB_20130104.mxd

Rocky Hills HMA
(83,994 acres)

EXPLANATION

- Existing Pipeline
- Facilities
- Rocky Hills HMA - NV0605
- Mine Plan Area
- Public
- Private

Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

Feet
0 2,000

Battle Mountain
BLM District
Mount Lewis Field Office

NAD 1983 UTM Zone 11N

SCALE: 1 inch = 2,000 feet

TONKIN SPRINGS CLOSURE PLAN ENVIRONMENTAL ASSESSMENT

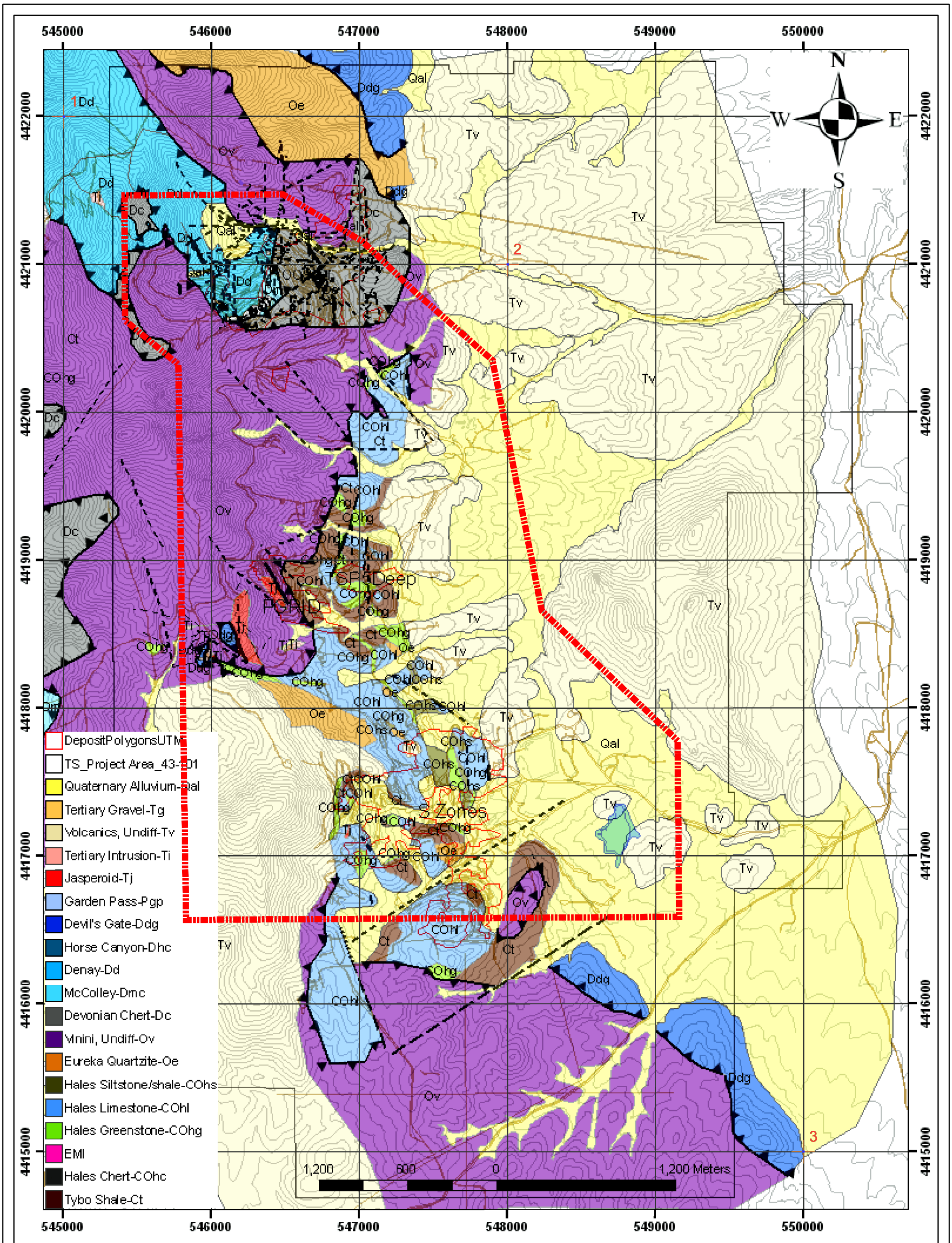
DRAWING TITLE:
HERD MANAGEMENT AREAS

DRAWING NO. **FIGURE 16**

REVISION NO. **A**

DATE: **5/1/2014**

PATH: G:\Sites_Reno\Tonkin_Springs\162200_330_EA\EA_162200_330_Fig16_Herd_Areas_BVB_20130104.mxd



Note: No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

EXPLANATION

Mine Plan Area

N

Feet

0 2,000

Battle Mountain
BLM District
Mount Lewis Field Office

NAD 1983 UTM Zone 11N

SCALE: 1 inch = 2,000 feet

TONKIN SPRINGS CLOSURE PLAN ENVIRONMENTAL ASSESSMENT

DRAWING TITLE:

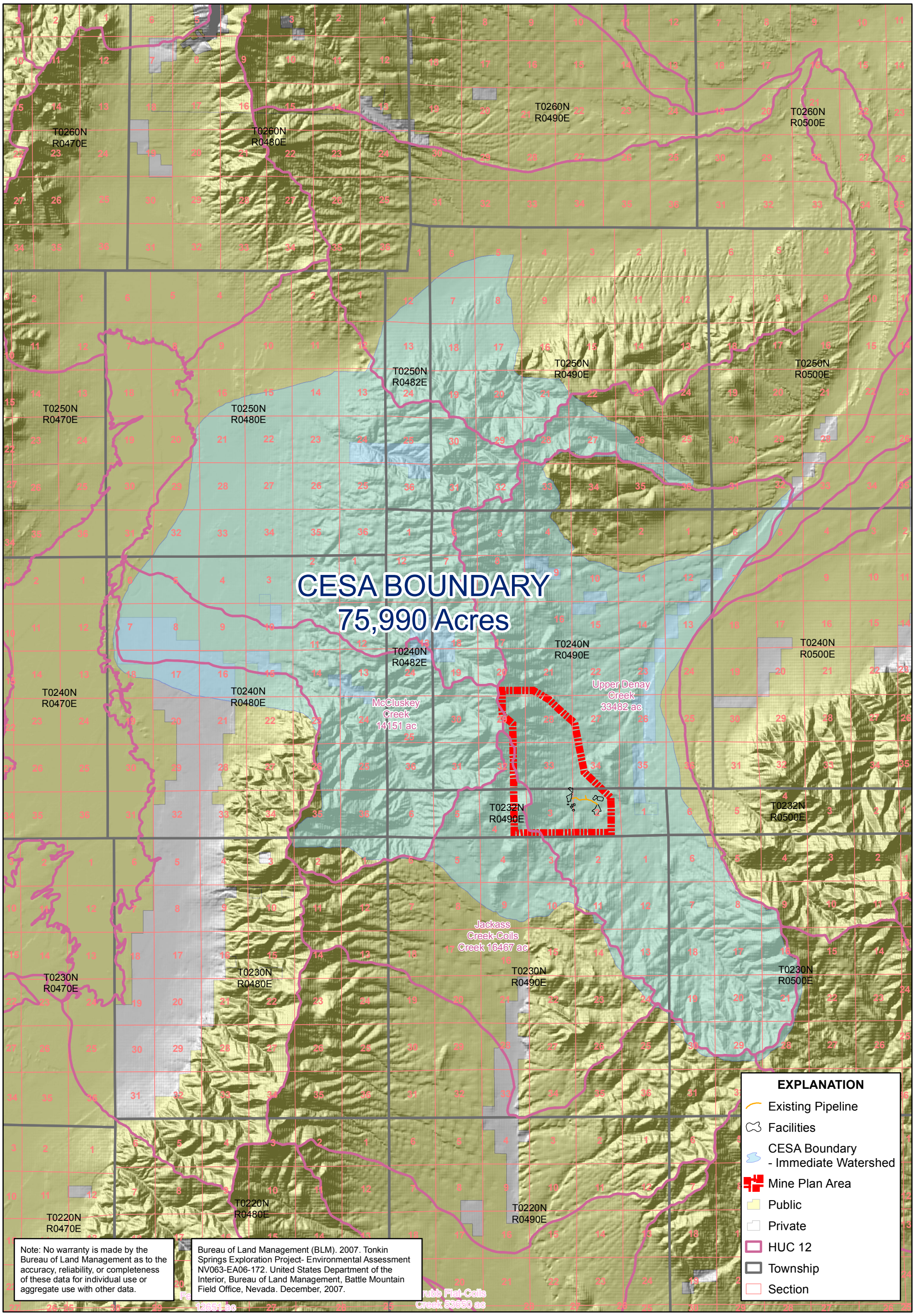
SURFACE GEOLOGY DISTRIBUTION MAP

DRAWING NO. FIGURE 17

REVISION NO. A

DATE: 2/3/2014

PATH: G:\Sites_Reno\Tonkin_Springs\162200_330_EA\EA_162200_330_Fig18_Geology_Map_BCH.mxd



N

Feet

0 10,000

Battle Mountain
BLM District
Mount Lewis Field Office

NAD 1983 UTM Zone 11N

SCALE: 1 inch = 10,000 feet

TONKIN SPRINGS CLOSURE PLAN ENVIRONMENTAL ASSESSMENT

DRAWING TITLE:
CESA BOUNDARY

DRAWING NO. **FIGURE 18**

REVISION NO. **A**

DATE: **5/1/2014**

PATH: G:\Sites_Reno\Tonkin_Springs\162200_330_EA\EA_162200_330_Fig18_CESA_BVB_20130104.mxd