Appendix B. 2010 Report of Waste Discharge Bishop Mill Project Inyo County California (Revised November 15, 2010)

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2010 REPORT OF WASTE DISCHARGE
BISHOP MILL PROJECT
INYO COUNTY, CALIFORNIA

Prepared for:

State of California
Lahontan Regional Water Quality Control Board
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June 30, 2010
(Revised November 15, 2010)

2010 Report of Waste Discharge
Bishop Mill Project

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Appendix G – Stormwater Diversion Design ..... attached
Appendix H – Liner Product Information ..... attached
Appendix I – Technical Specifications ..... attached
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1 Introduction

In August 2009, the former owner and operator of the Bishop Mill (Project), Pruett Ballarat Inc., submitted an amended Plan of Operations (PoO) and Reclamation Plan for the Bishop Mill in order to meet BLM regulatory requirements for surface management of public lands under Title 43 Code of Federal Regulations, Section 3809 (43 CFR§ 3809). Since that time, ownership of the operation has changed. The current owner of the Bishop Mill is 0877887 BC Ltd., which is a wholly-owned subsidiary of CMC Metals Ltd. (Operator) of Vancouver, Canada. The Operator plans to re-activate the existing Bishop Mill as an independent mill, processing gold-bearing ores transported from offsite mining locations.

The Operator intends to transport up to 75 tons per day of ore to stockpile at the Project site for processing. The ore will be processed through the existing gravity mill at an estimated throughput rate of 4 tons per hour (up to 96 tons per day). The waste derived from ore processing (tailings) will be deposited in the proposed new waste management unit (WMU) for Group A mining waste disposal constructed at the site of an existing, but inoperative, tailings impoundment. The mill and proposed WMU will be operated for a period of up to 5 years with a projected total of up to 32,000 tons of tailings deposited in the WMU based on the project design described herein. Detailed drawings of the existing topography and existing and proposed facilities at the Bishop Mill Project are provided in the **Appendix A** of this report.

1.1 Regulatory Requirements

The WMU at the Project is governed by the requirements of Division 2 – Solid Waste, Chapter 7 – Special Treatment, Storage and Disposal Units, Subchapter 1 – Mining Waste Management of Title 27 of the California Code of Regulations (CCR). These regulations are administered by the Lahontan Regional Water Quality Control Board (LRWQCB) through the issuance of waste discharge requirements (WDRs), applicable to the owner or operator of a waste management unit for the treatment, storage, or disposal of mining waste.

1.2 Purpose and Need

On April 15, 2010, BLM granted an extension to Pruett Ballarat, Inc., the former operator of the Bishop Mill Project, establishing a deadline for submittal of an application for a Waste Discharge permit. The extension was granted subsequent to the submittal of an amended PoO for the project under 43 CFR Parts 3809.401. In accordance with the extension, BLM required the submittal of a detailed engineering design for a Group A Waste Management Unit (WMU) to the LRWQCB by June 30, 2010. The current Operator has prepared this Waste Discharge Report to satisfy BLM's directive and obtain approval to construct and operate the proposed new waste management unit.

1.3 Location and Property Ownership

The Project is located approximately 9 miles northeast of the town of Bishop, California. The site is accessed by traveling one mile west of Highway 6 on Rudolph Road, and approximately one-quarter mile south on Pumice Road, as shown on Figure 1-1. The Project is situated on public lnds administered by the U.S. Department of the Interior, Bureau of Land Management, Bishop Field Office (BLM) within the SW¼ of Section 4, Township 6 South, Range 33 East, Mount Diablo Baseline and Meridian (refer to **Figure 1-1).**

Mr. Don Wedman is the authorized representative of the Operator, 0877887 BC Ltd. Bernadette Lovato is the Field Manager for BLM's Bishop Field Office. Tamerle Lundquist is the project contact with the LRWQCB. Contact information for each is provided below.

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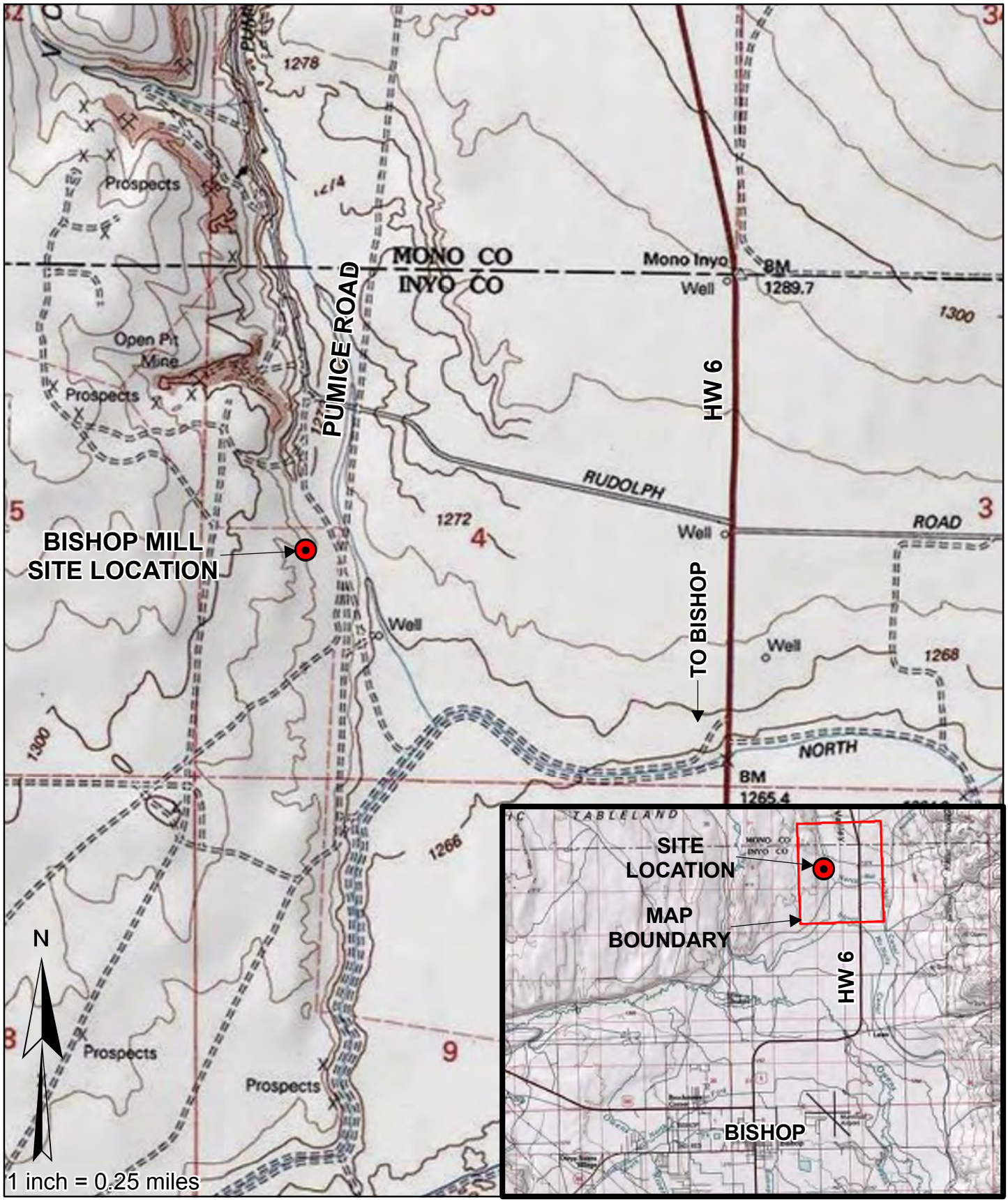

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1.4 Waste Management Unit

The Operator proposes to remove the small amount of previously generated tailings in the existing tailings pond, dispose of the existing liner, and construct a new double-lined waste management unit at the site of the existing pond. The new WMU will include a leakage collection and recovery system (LCRS) between the primary and secondary liners. The new WMU has been designed, and will be constructed, in accordance with California Title 27 regulations for a Group A mining waste management unit. The design of the WMU is described in Section 5.0. Design drawings, Technical Specifications, and a Construction Quality Assurance Plan stamped by a California-registered civil engineer are included in Appendices A, I and J, respectively.

2 Existing Environmental Conditions

The Project is located in Inyo County near the northern extent of Owens Valley. The crest and eastern escarpment of the Sierra Nevada occupy the western half of the area and the western foothills of the White Mountains lie along the eastern margin. Between the Sierra Nevada and White Mountains is a structural trough that contains the Owens and Round Valleys and the Volcanic Tableland (Bateman, 1965).

The Project area is located on the eastern edge of the Volcanic Tableland and drains to the east into the valley bottom which drains south eventually reaching into the Owens River. The primary land use in the immediate vicinity (five-mile radius) is ranching, mining, and milling of various minerals (Roger W. Smith Consulting Geologist, 2005). Approximately one mile east of Highway 6 on Rudolph Road is a small residential community development and approximately four miles south of the Project is the small town of Laws, which is the nearest residential development to the Project.

2.1 Facilities

Existing facilities consist of an access road, fence and power lines, mill building, warehouse, garage, two monitoring wells, a production well (also used for monitoring), propane tank and an existing inoperable tailings pond. A 500-gallon fuel storage tank currently stored at the site will be refurbished and used for on-site storage of diesel fuel. All facilities are located on mill-site claims controlled by the Operator.

2.2 Topography

The existing topography at the Project site is illustrated on **SRK Drawing 204600.010-101** in **Appendix 1**. The topography of the Project is generally flat to moderately sloped from the foothills of the volcanic table lands to the valley floor.

2.3 Climate

Climatic conditions for the Project are represented by data from the Bishop WSO Airport meteorological data station (Station ID No. 040822), located approximately 5.7 miles south of the Project. Data for the Bishop Airport station were obtained from the Western Regional Climate Center website (www.wrcc.dri.edu) for the period of recorded data from 1948 through 2010. Average monthly climatic data are summarized in **Table 2-1**.

2.3.1 Precipitation and Evaporation

Based on the data from the Bishop Airport meteorological data station, the climate in the vicinity of the Project site is semi-arid with an average annual precipitation of 5.28 inches.

The closest and most representative meteorological station that records evaporation is the Topaz Lake, California meteorological station. Measured average annual pan evaporation at the Topaz Lake station is 69 inches for the period of record from 1957 to 2005. The Topaz Lake station is situated at an elevation of approximately 5,200 feet above mean sea level (amsl), similar to the elevation at the Project ~4,200 feet amsl. Monthly average evaporation is summarized in **Table 2-1**.

2.3.2 Temperature

Average daily temperatures at the Bishop Airport station range from a high of 97.7 degrees Fahrenheit (°F) in July to a low of 21.8 °F in January. Monthly mean highs and lows are summarized in **Table 2-1**.

2.3.3 Wind

Wind speed and direction in the vicinity of the Project site are characterized by records for the Bishop Airport. Monthly average wind speeds range from 6.8 miles per hour (mph) in January to 10.4 mph in April. Prevailing winds are primarily from the north, except in July and August when the winds are primarily from the south-southeast. Monthly wind speed and direction are summarized in **Table 2-1**.

Table 2-1. Summary of Climatic Conditions

	Temperature (degrees F)[1]		Wind Speed[1]	Wind Direction[1]	Precipitation (inches)[1]	Evaporation[2]
Month	**Min.**	**Max.**	**Mean (mph)**	**Prevailing**	**Mean**	**(inches)**
January	21.8	53.0	6.8	N	1.15	0.0
February	26.0	57.9	8.2	N	0.92	0.0
March	30.2	64.2	9.6	N	0.48	0.0
April	36.1	71.7	10.4	N	0.28	7.2
May	43.9	81.0	9.2	N	0.25	9.1
June	50.8	90.9	8.8	N	0.15	10.9
July	56.2	97.7	8.1	SSE	0.17	12.7
August	53.6	95.5	8.3	SSE	0.12	11.6
September	46.7	87.8	8.1	N	0.19	8.8
October	37.2	76.5	8.0	N	0.22	5.9
November	27.7	63.1	7.1	N	0.54	2.8
December	21.8	54.1	7.1	N	0.81	0.0
TOTAL					**5.28**	**69.0**

NOTES
[1] Data from Bishop Airport, NOAA meteorological data station (period of record 1948-2009).
[2] Evaporation data from Topaz Lake at elev. 5200 ft amsl (period of record 1957-2005).

2.4 Geology and Seismicity

2.4.1 Regional Geology

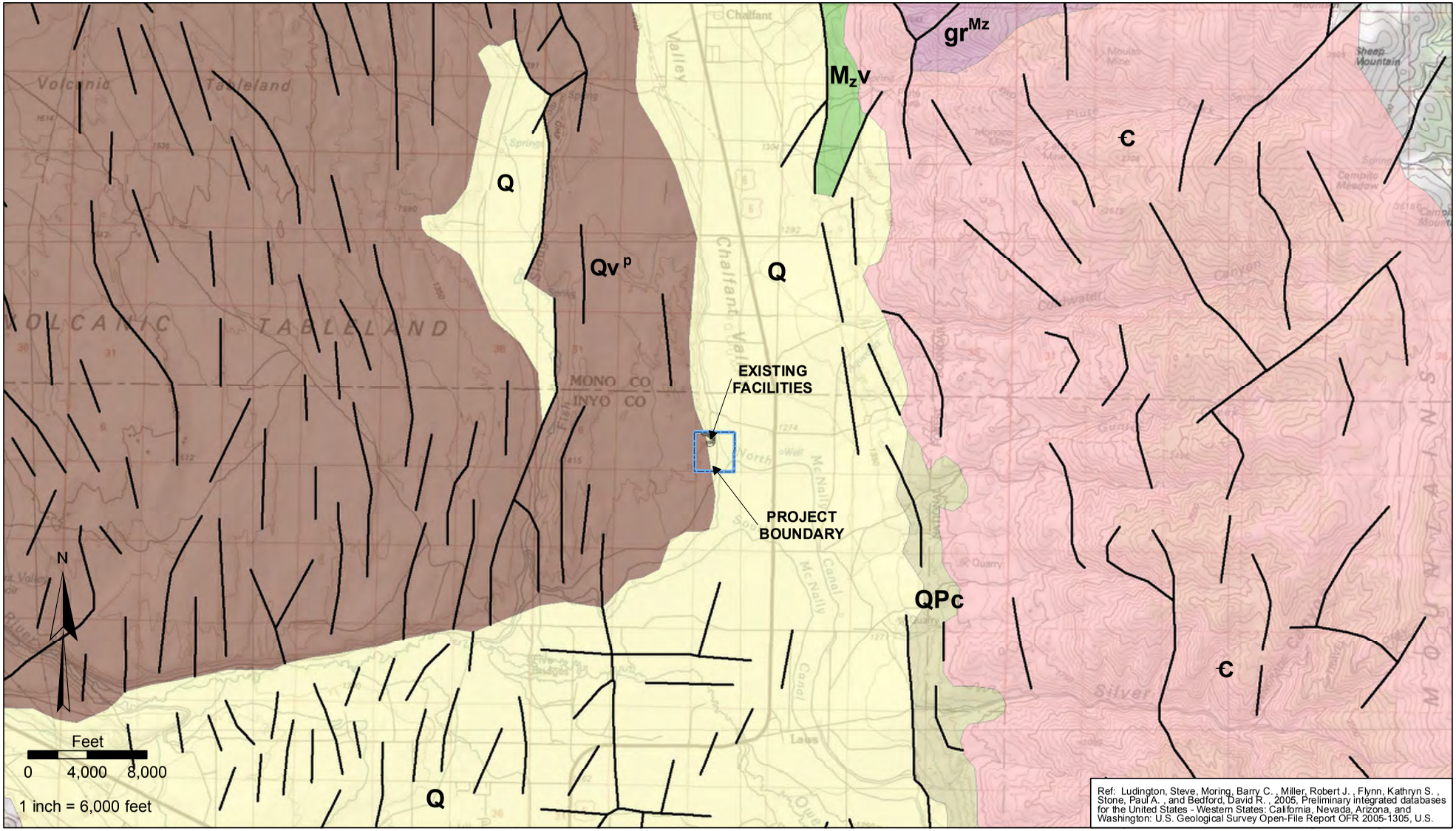
The Project is located in the southern part of the Chalfant Valley, which joins the Owens Valley approximately five miles north of Bishop, California. Chalfant Valley is a narrow alluvial plain bounded on the east by the White Mountains and on the west by the Volcanic Tableland. The White Mountains are composed predominantly of granitic rocks partially overlain by metasedimentary and metavolcanic rocks. The Volcanic Tableland is comprised of pyroclastic deposits derived from the volcanic explosions in the Long Valley caldera. The White Mountains extend to more than 13,000 feet amsl, while the Volcanic Tableland rises to 6,000 feet amsl.

The Chalfant Valley extends north from its junction with the Owens Valley to a geomorphic intersection with the Millner Creek alluvial fan, approximately 4.5 miles north of Chalfant. The Millner Creek alluvial fan dissects the valley and marks the separation of Chalfant Valley from Hammil Valley to the north. Several faults run through the valley, including the Fish Slough fault approximately 2 miles west of the Project, and the White Mountain range front fault approximately 2 miles east of the Project (Department of Conservation, Division of Mines and Geology, 1997). Surface geology in the vicinity of the Project is shown on **Figure 2-1**.

2.4.2 Local Geology and Soils

Three test pits were excavated on April 28, 2010 both north and south of the existing tailings pond to evaluate the near surface materials available for WMU embankment construction. The locations of the test pits are illustrated on **SRK Drawing 204600.010-101** and **102** in **Appendix A**. The test pits were advanced to approximately 15 feet below ground surface. Soils encountered during test pitting were bulk sampled in 5-gallon buckets and the samples were submitted to Sierra Geotechnical Services, Inc., of Bishop, California for laboratory analysis. The results of the analyses are included in **Appendix B**, and indicate site soils can be generally described as non-plastic, sandy silt (BS-1 in the sidewall of the existing pond) to very silty sand with a trace of gravel (TP-1, 10-14 feet). The results of grain size distribution testing are summarized in **Figure 2-2** below.

Sample TP-1 (10-14 feet) was blended with TP-2 (12-15 feet) and tested for maximum dry density and optimum moisture by modified Proctor testing (ASTM D1557). The combined sample was then remolded to 90 percent of maximum dry density at optimum moisture content (per ASTM D1557) and subjected to a three-point direct shear test (ASTM D3080) with normal loads of 2, 5 and 10 psi to represent the conditions that will be present in the constructed eastern pond embankment slope. Sample TP-1 (0-10 feet) was blended with TP-3 (0-12 feet) and subjected to the same testing to establish the range of possible shear strengths for site soils. Stability analyses completed using these data are described in **Section 5.5.3**. The results of shear strength testing of site soils are summarized in **Table 2-2** below.



EXPLANATION

Faults

Є Sandstone, shale, limestone, dolomite, chart, quartzite, and phyllite.

$M_z v$ Undivided Mesozoic volcanic and metavolcanic rocks. Andesite and rhyolite flow rocks, greenstone, volcanic breccia and other pyroclastic rocks

Q Alluvium, lake, playa, and terrace deposits, unconsolidated and semi-consolidated

QPc piliocene and/or Pleistocene sandstone, shale, and gravel deposits

gr^{Mz} Mesozoic granite, quartz monzonite, granodiorite, and quartz diorite.

Qv^{p} Quaternary pyroclastic and volcanic mudflow deposits.

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BISHOP MILL
REPORT OF WASTE DISCHARGE
INYO COUNTY, CALIFORNIA

SURFACE GEOLOGY

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Figure 2-2. Summary of Grain Size Distribution Test Results

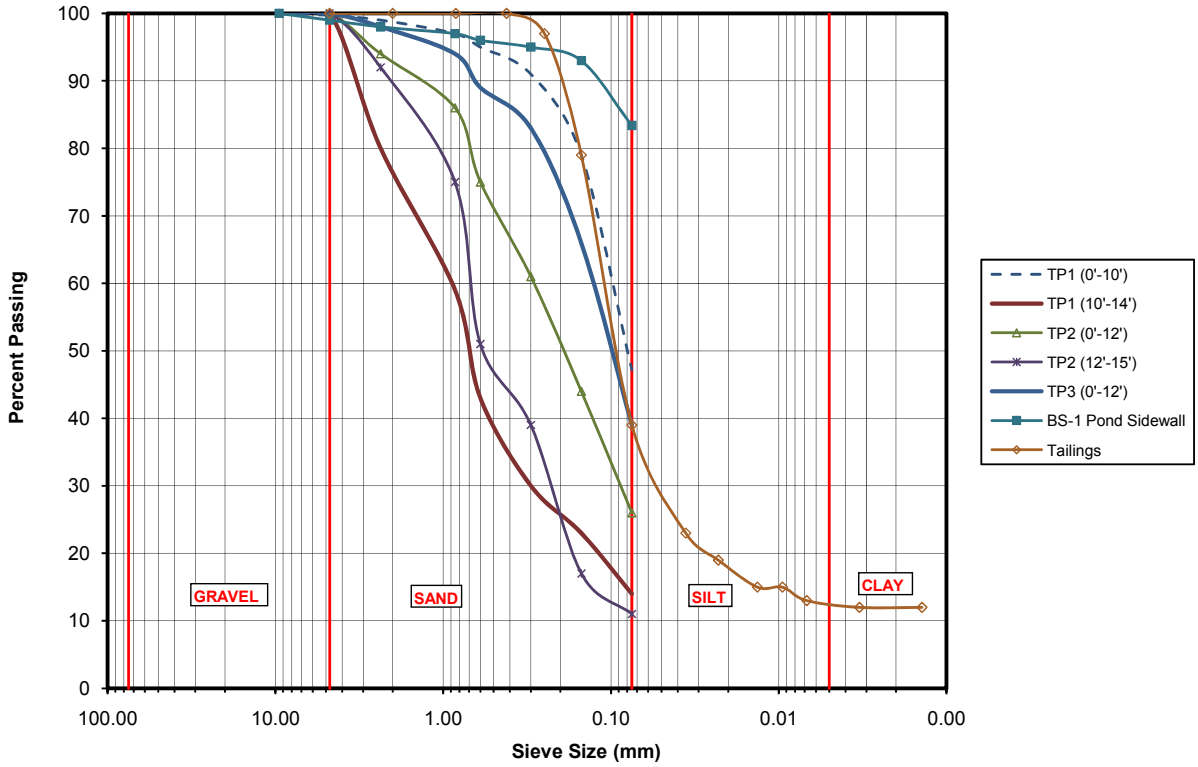


Table 2-2. Summary of Modified Proctor and Direct Shear Test Results

Sample	Maximum Dry Density (pcf) (ASTM D1557)	Optimum Moisture (%) (ASTM D1557)	Friction Angle (Ø) (ASTM D3080)	Cohesion (psf) (ASTM D3080)
TP-1 (10-14') blended with TP-2 (12-15')	118	10	35	119
TP-1 (0-10') blended with TP-3 (0-12')	100	15.5	26	74

According to the U.S. Department of Agriculture, Natural Resources Conservation Service, soils at the Project consist of Yaney-Yaney loam associated and Cambidic Haplodurids-Type Haplodurids association. The Yaney-Yaney loam is described as well drained and containing sand, sandy loam and sandy loam with various amounts of gravel. The parent material is described as "Volcanic ash and/or alluvium derived from mixed sources." The Cambidic soil is described as well drained and containing gravelly to extremely gravelly sandy loam with some cementation at 11 to 18 inches below ground surface. The parent material is described as "alluvium derived from mixed sources" (Dept. of Agriculture, Natural Resources Conservation Service, 1996).

2.4.3 Geologic Structures

Several faults run through the Chalfant Valley, including the Fish Slough fault approximately 2 miles west of the Project, and the White Mountain range front fault approximately 2 miles east of the Project. These faults are discussed in further detail in **Section 2.4.4**. No other geologic structures have been associated with the Project.

2.4.4 Regional and Local Faulting and Seismicity

The Bishop Mill is located within the Eastern California Shear Zone, a broad zone of strike-slip and normal faults distributed across the Owens Valley, the Mohave Desert, eastern Nevada, and northeastern California (Peterson et al., 1996). **Figure 2-1**, "Surface Geology," illustrates the site location with respect to regional faulting by Ludington et al. (2005). Mapped Holocene faulting in the Project vicinity is shown on **Figure 2-3**.

Based on available mapping, the Bishop Mill project is located between the Fish Slough fault zone approximately two miles west of the site, and the White Mountain fault zone approximately 2 miles east of the site. There are no Holocene faults mapped within the Project site (USGS, 2010; CA-DMG, 2000). **Figure 2-3** shows designated areas on either side of both faults zones defined as Alquist-Priolo Special Studies Zones. These zones delineate areas relative to mapped faults within which special seismic hazard studies are required prior to building structures for human occupancy. Strong ground shaking due to seismic activity is possible within these designated areas, however, the Project site is not located within an identified Alquist-Priolo fault zone. Additional faults in the vicinity of the Project are listed below, together with the distance to the closest reach of the fault and direction from the Project.

- Round Valley Fault - approximately 14 miles west of the Project site.
- Owens Valley Fault Zone, northern segment - approximately 5.6 miles south of the Project site.
- Hilton Creek Fault zone, southernmost segment – approximately 22 miles west of the Project site.
- Fish Lake Valley fault zone – approximately 19 miles east northeast of the Project site.
- Hartley Springs Fault fault zone, southernmost segment – approximately 40 miles north-northwest of the Project site.
- North Death Valley fault zone, northernmost segment – approximately 50 miles south of the Project site.

The seismic characteristics of these faults (within an approximate radius of 50 miles from the site) are listed in **Table 2-3**.

Based on information obtained from the California Geologic Survey website *Probabilistic Seismic Hazard Mapping Ground Motion* page for the Bishop, California area (available at http://redirect.conservation.ca.gov/cgs/rghm/pshamap/pshamap.asp), ground motions for the site expressed as a fraction of the acceleration of gravity (g) are summarized in **Table 2-4** (10% probability of exceedance in 50 years). Three values of ground motion are shown for peak ground

acceleration (PGA), spectral acceleration (Sa) at short (0.2 second) and moderately long (1.0 second) periods. Ground motion values are also affected by localized variations in subsurface geology. Each predicted ground motion value is shown in **Table 2-4** for three different subsurface conditions: firm rock, soft rock and alluvium.

Table 2-3. Seismic Characteristics of Regional Faults

Fault Name	Minimum Distance to Site (miles)	Fault Length[1] (miles)	Maximum Magnitude[1] (M_w)	Slip Rate[1] (mm/yr)	Duration of Strong Ground Shaking[2] (sec)
Fish Slough fault zone	2	15.6	6.6	0.20	17-22
White Mtn. fault zone	2	63	7.1	1.00	17-22
Round Valley	14	25.2	6.8	1.00	16-23
Owens Valley	5.6	72.6	7.6	1.50	18-24
Hilton Creek	22	17.4	6.7	2.50	10-17
Fish Lake Valley	19	62		3-12	
Hartley Springs	40	15	6.6	0.50	5-11
Northern Death Valley	50	64.8	7.2	5.00	14-21

[1] Petersen et al., 1996.
[2] Bolt, 1977, bracketed duration (acceleration >0.05g; frequency >2Hz).

Table 2-4. Ground Motion Table (10% prob. of exceedance in 50 Years)

Ground Motion	Firm Rock	Soft Rock	Alluvium
PGA	0.329	0.344	0.376
Sa 0.2 sec	0.797	0.838	0.914
Sa 1.0 sec	0.269	0.337	0.420

2.5 Hydrogeology

The Project is located in the northern region of the Owens Valley Groundwater Basin, which is a subunit of the Lahontan Drainage Province. This sub-unit encompasses an area of approximately 1,030 square miles and is drained by the Owens River. The basin is bounded on the east by the White Mountains and on the west by the Volcanic Tableland. Recharge to the basin is derived from snow-melt and precipitation runoff from the adjacent highlands, and from direct precipitation onto the valley floor. The location of the Project site within the Chalfant Valley is shown on **Figure 2-4**. Groundwater in the Chalfant Valley region generally occurs in unconsolidated to semi-consolidated alluvial deposits and flows towards the axis of the valley (Kleinfelder, 1992). **Figure 2-5** provides the location of the wells within a (one-mile radius) of the proposed WMU, including monitoring wells MW-1, MW-2, MW-3, and MW-4 and the production well PW-3.

A hydrogeologic investigation of the aquifer beneath the Project site was completed by SRK in October 2010 (SRK, 2010). A complete report documenting the methods and results of the investigation is included in **Appendix C** for reference. **Table 2-5** presents a summary of site characterization results from the Bishop Mill hydrogeology investigation. **Figure 1** in **Appendix C** shows the location of the wells, the general flow direction, groundwater contours, and the radius of influence of production well PW-3. **Figure 2** in **Appendix C** shows a cross-section of the proposed WMU in relation to the groundwater elevation and MW-3, MW-4, and PW-3. Based on the results of the investigation, the underlying groundwater is approximately 25 feet below the base of the proposed double-lined WMU.

Table 2-5. Aquifer Characteristics

Aquifer Parameter	MW-1	MW-2	MW-3	MW-4	PW-3
Depth to Water (feet bgs)	35.5	40.95	64.59	42.8	47.45
Approximate Surface Elevation (feet amsl)	4244.1	4249.2	4276.5	4250.0	4258.0
Approximate Groundwater Elevation (feet amsl)	4208.6	4208.3	4211.9	4207.2	4210.6
Flow Direction	87°				
Gradient (ft/ft)	0.013				
Permeability (Darcy)	1.25E-07	8.80E-08	7.34E-09	1.22E-08	6.22E-06
Hydraulic Conductivity (ft/day)	1.02	0.72	0.06	0.10	50.60
Pumping Rate of PW-3 Pump (gpm)					87
Maximum Yield PW-3 (gpm)					86.3
Specific Capacity of PW-3 (gpm/ft)					17.3
Drawdown (feet)	0.48	0.33	3.18	0.40	5.00
Radius of Influence of PW-3 (ft)					95
Proximity from WMU	Cross Gradient	Down and Cross Gradient	Up Gradient	Down Gradient	Cross Gradient
Approximate Linear Distance to WMU (ft)	230	130	80	90	80

2.5.1 Hydraulic Conductivity

The capacity of the most limiting layer of each soil association identified in **Section 2.4.2** to transmit water under saturated conditions (Ksat) ranges from 0.20 to 6.0 inches per hour ($1.4x10^{-4}$ to $4.2x10^{-3}$ centimeters per second, cm/s) according to NRCS (1996). The hydrogeologic investigation conducted by SRK (SRK, 2010) included aquifer testing to determine the hydraulic conductivity of sediments beneath the proposed WMU. In MW-1, MW-2, and MW-4 the average hydraulic conductivity is approximately 0.40 feet/day ($1.4x10^{-4}$ cm/sec), significantly less than the hydraulic conductivity calculated from the PW-3 pumping well of 50.60 feet/day ($1.8x10^{-2}$

cm/sec). As shown on **Figure 2** in **Appendix C**, the bottom elevations of the monitoring wells are similar and are screened through the upper portions of the aquifer beneath the proposed WMU whereas, the bottom elevation of well PW-3 is significantly deeper than the monitoring wells and screened through a deeper, much more transmissible portion of the aquifer, verified by the distinct difference in hydraulic conductivity values. This distribution suggests that producing zones of higher transmissivity are deeper, whereas the sediments in the upper portions of the aquifer directly beneath the WMU have relatively low permeability by comparison (SRK, 2010).

2.5.2 Ground Depth and Water Flow Direction

As shown on **Figure 1** in **Appendix C**, the aquifer beneath the WMU flows almost due east toward the valley floor with an average gradient of 0.013 feet/foot. Groundwater is approximately 25 feet below the bottom elevation of the proposed WMU as shown in **Figure 2** in **Appendix C**.

2.5.3 Springs and Surface Water

There is no perennial surface water within a one-mile radius of the proposed WMU. The nearest perennial surface water is Fish Slough, located approximately 2 miles to the west, as shown on **Figure 2-4**. The north fork of the man-made McNally Canal crosses the southeastern corner of the project site, but is more than 1,000 feet south of the proposed WMU (refer to **Figure 2-3**). The McNally Canal is owned and operated by the Los Angeles Department of Water and Power as a man-made irrigation structure which is typically dry. **Figure 2-4** also shows the locations of seven unnamed springs within a five-mile radius of the Project. The closest spring to the Project site is located approximately one mile east of the southern Project boundary.

2.5.4 Water Quality

Groundwater samples were collected from wells MW-1, MW-2 and PW-3 in September 2008, from MW-1 and MW-2 in August 2010, and from all wells in October 2010. Samples were analyzed by a California certified laboratory for constituents including dissolved metals and inorganic constituents specified by Inyo County Human Health Services. The location of the wells are shown on **Figure 2-5**. The results of the chemical analyses have been tabulated in **Table 2-6** and have been compared to previous water quality analytical results for each respective well in addition to comparative values of EPA and California Maximum Contaminant Level (MCL) for drinking water. A copy of the laboratory reports are provided in **Appendix D**.

Based on available analytical results from samples of groundwater collected from the aquifer at the Bishop Mill site, the groundwater quality generally meets EPA and California drinking water MCL. However, for the fourth quarter 2010 sampling event, analytical results indicate exceedances above the drinking water MCL for aluminum, arsenic, and lead in the upgradient monitoring well MW-3.

Table 2-6: Water Quality

Parameters	U.S. EPA Drinking Water MCL	California Drinking Water (MCL)	3rd Qtr 2008			3rd Qtr 2010		4th Qtr 2010				
Name of Certified Lab	--	--	Test America	Test America	Test America	WET	WET	WET	WET	WET	WET	WET
Lab Reference #	--	--	MW-1	MW-2	PW-3	MW-1	MW-2	MW-1	MW-2	MW-3	MW-4	PW-3
Sample Date	--	--	8/26/2008	8/26/2008	8/26/2008	8/9/2010	8/9/2010	10/4/2010	10/4/2010	10/4/2010	10/4/2010	10/2/2010
Lab Test Date	--	--	N/A	N/A	N/A	8/10/2010	8/10/2010	10/5/2010	10/5/2010	10/5/2010	10/5/2010	10/5/2010
pH, Lab-su	--	--	--	--	--	8.22	8.22	7.75	7.82	8.21	7.73	7.76
Bicarbonate (HCO3),	--	--	ND	ND	ND	150	180	150	150	360	150	160
Carbonate (CO3),	--	--	ND	ND	ND	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH),	--	--	ND	ND	ND	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total Alkalinity,	--	--	ND	ND	ND	130	150	120	120	290	120	130
Chloride,	--	--	ND	ND	ND	24	22	24	24	56	22	35
Fluoride,	2[b]	2	ND	ND	ND	0.44	0.48	0.36	0.44	0.91	0.4	0.34
Sulfate,	--	--	ND	ND	ND	160	150	160	160	430	160	210
NO2 & NO3,	10	10	ND	ND	ND	0.25	0.26	0.27	0.29	0.23	0.3	0.3
Total Dissolved Solids,	--	--	--	--	--	490	460	480	480	1400	450	560
WAD Cyanide,	0.2	0.15	ND	ND	ND	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Aluminum,	0.05 to 0.2[b]	0.2[b]	ND	ND	ND	<0.045	<0.045	<0.045	<0.045	4.4	<0.045	<0.045
Barium,	2	1	0.032	0.03	0.046	0.028	0.029	0.031	0.031	0.064	0.022	0.036
Beryllium,	0.004	0.004	ND	ND	ND	<0.0010	<0.0010	<0.0010	<0.0010	0.0012	<0.0010	<0.0010
Bismuth,	--	--	ND	ND	ND	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Boron,	--	--	ND	ND	ND	0.24	0.24	0.2	0.21	0.2	0.23	0.20
Cadmium,	0.005	0.005	ND	ND	ND	<0.0010	<0.0010	<0.0010	<0.0010	0.0017	<0.0010	<0.0010
Calcium,	--	--	ND	ND	ND	52	46	56	49	47	50	75
Chromium,	0.1	0.05	ND	ND	ND	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt,	--	--	ND	ND	ND	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Copper,	1.3[d]	1.3[d]	ND	ND	ND	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Gallium,	--	--	ND	ND	ND	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Iron,	--	--	ND	ND	ND	<0.010	<0.010	<0.010	<0.010	4.9	<0.010	<0.010
Lithium,	--	--	ND	ND	ND	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Magnesium,	--	--	ND	ND	ND	3.7	3.6	4	3.9	9.2	3.7	4.9
Manganese,	--	--	ND	ND	ND	<0.0050	<0.0050	<0.0050	<0.0050	0.42	<0.0050	<0.0050
Molybdenum,	--	--	0.015	0.016	0.015	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nickel,	--	0.1	ND	ND	ND	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phosphorus,	--	--	ND	ND	ND	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Potassium,	--	--	ND	ND	ND	12	12	12	12	9.8	11	12
Scandium,	--	--	ND	ND	ND	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Silver,	--	--	ND	ND	ND	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Sodium,	--	--	ND	ND	ND	79	79	69	71	320	71	75
Strontium,	--	--	ND	ND	ND	0.51	0.44	0.49	0.43	0.41	0.43	0.57
Tin,	--	--	ND	ND	ND	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Titanium,	--	--	ND	ND	ND	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Vanadium,	--	--	ND	0.0053	0.0056	0.012	0.013	<0.010	<0.010	0.02	<0.010	<0.010
Zinc,	--	--	ND	ND	0.18	<0.010	<0.010	<0.010	<0.010	0.094	<0.010	0.11
Mercury,	0.002	0.002	ND	ND	ND	0.00016	0.00024	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Antimony,	0.006	0.006	0.010	0.0087	0.0052	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
Arsenic,	0.010	0.010	ND	0.0068	ND	0.0053	0.0062	<0.0050	0.0055	0.015	0.0054	<0.0050
Lead,	0.015[d]	0.015[d]	ND	ND	ND	<0.0025	<0.0025	<0.0025	<0.0025	0.019	<0.0025	<0.0025
Selenium,	0.05	0.05	ND	ND	ND	<0.0050	<0.0050	<0.0050	<0.0050	0.0091	<0.0050	<0.0050
Thallium,	0.002	0.002	ND	ND	ND	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Anions, meq/L	--	--	--	--	--	6.51	6.74	6.5	6.51	16.5	6.45	8.02
Cations, meq/L	--	--	--	--	--	6.64	6.34	6.43	6.16	18	6.17	7.72
Error, %	--	--	--	--	--	1	3.1	<1.0	2.8	4.5	2.2	1.9
VOCs	--	--	ND	ND	ND	ND	ND	--	--	--	--	--

Note
MCL and Anylitical Results in (mg/L) unless otherwise specified, pH in s.u.
ND = Not detected at the reporting limit.
b. Secondary MCL

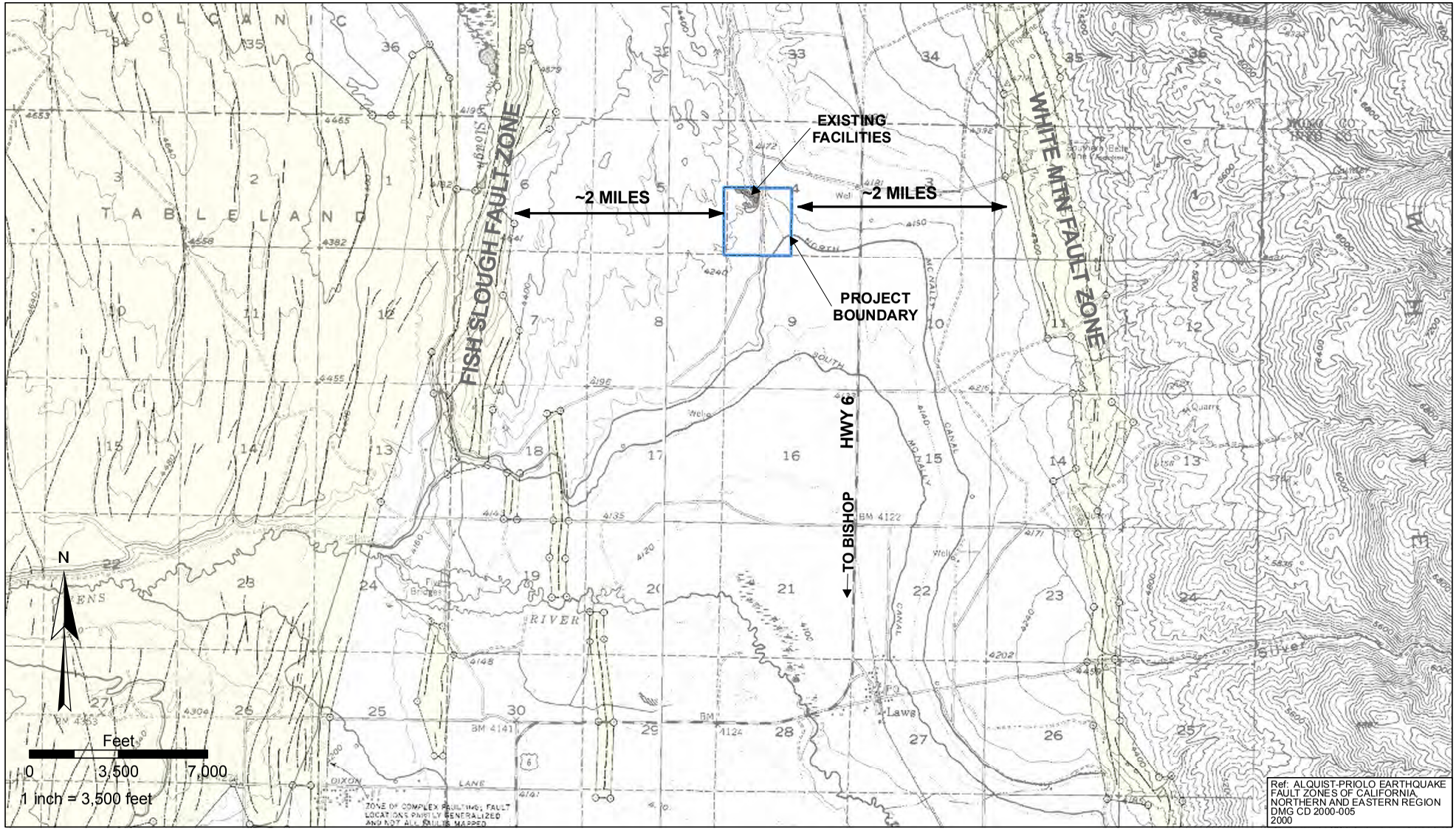
d. Regulatory Action Level; if system exceeds, it must take certain actions such as additional monitoring, corrosion control studies and treatment, and for lead, a public education program; replaces MCL

2.6 Land and Water Use

The primary land use in the immediate vicinity (five-mile radius) is ranching, mining, and milling of various minerals. The closest residential development to the Project is located approximately one mile east of Highway 6 on Rudolph Road, or approximately two miles east of the Project site. A second small residential community development is located approximately four miles south of the Project site in the small town of Laws (refer to **Figure 2-4**).

The primary water use in the immediate vicinity (five-mile radius) is for agricultural purposes (principally irrigation). Approximately 1,000 gallons of water per ton of ore processed is proposed for use at the Bishop Mill. Initially, water will be obtained from the site production well PW-3 and utilized to process ore. Some water will be lost through the process and to evaporation where the remaining volume not used in the process will be retained in the WMU. This water will be allowed to separate from the entrained tailings and will be used as necessary for additional ore processing. During the summer months when the evaporation rate is highest, the amount of "make-up" water necessary to meet the process circuit water requirements for ore processing will be obtained from the PW-3 well at an approximate pumping rate of 20 gpm. On October 4, 2010 SRK completed a hydrogeologic investigation of the aquifer beneath the proposed WMU to evaluate the potential effects that pumping the PW-3 well for process use may have on the underlying aquifer. Generally, the investigation included the installation of additional groundwater monitoring wells, conducting slug tests in the monitoring wells to identify the hydraulic conductivity of the aquifer beneath the proposed WMU, and conducting a 24-hour pump test of the PW-3 site production well to determine the hydraulic conductivity, pumping rate, maximum yield, specific capacity, drawdown, and potential radius of influence of the PW-3 well. The results of the investigation are summarized in **Table 2-5** above. A copy of the investigation report is included in **Appendix C**.

Based on the results of the hydrogeologic investigation, the PW-3 well yielded a maximum discharge rate of around 87 gpm. The specific capacity of the PW-3 well is 17.3 gpm/ft. Drawdown resulting from the 24-hour pump test occurred in all wells. In the PW-3 well, the maximum drawdown was 5 feet. The radius of influence was estimated at 95 feet. Drawdown decreased to less than 0.5 feet outside the radius of influence (SRK, 2010). **Figure 1** in **Appendix C** shows the location of the wells used in the investigation and radius of influence based on 87 gpm, which is significantly more discharge than proposed to support the process.



BISHOP MILL			
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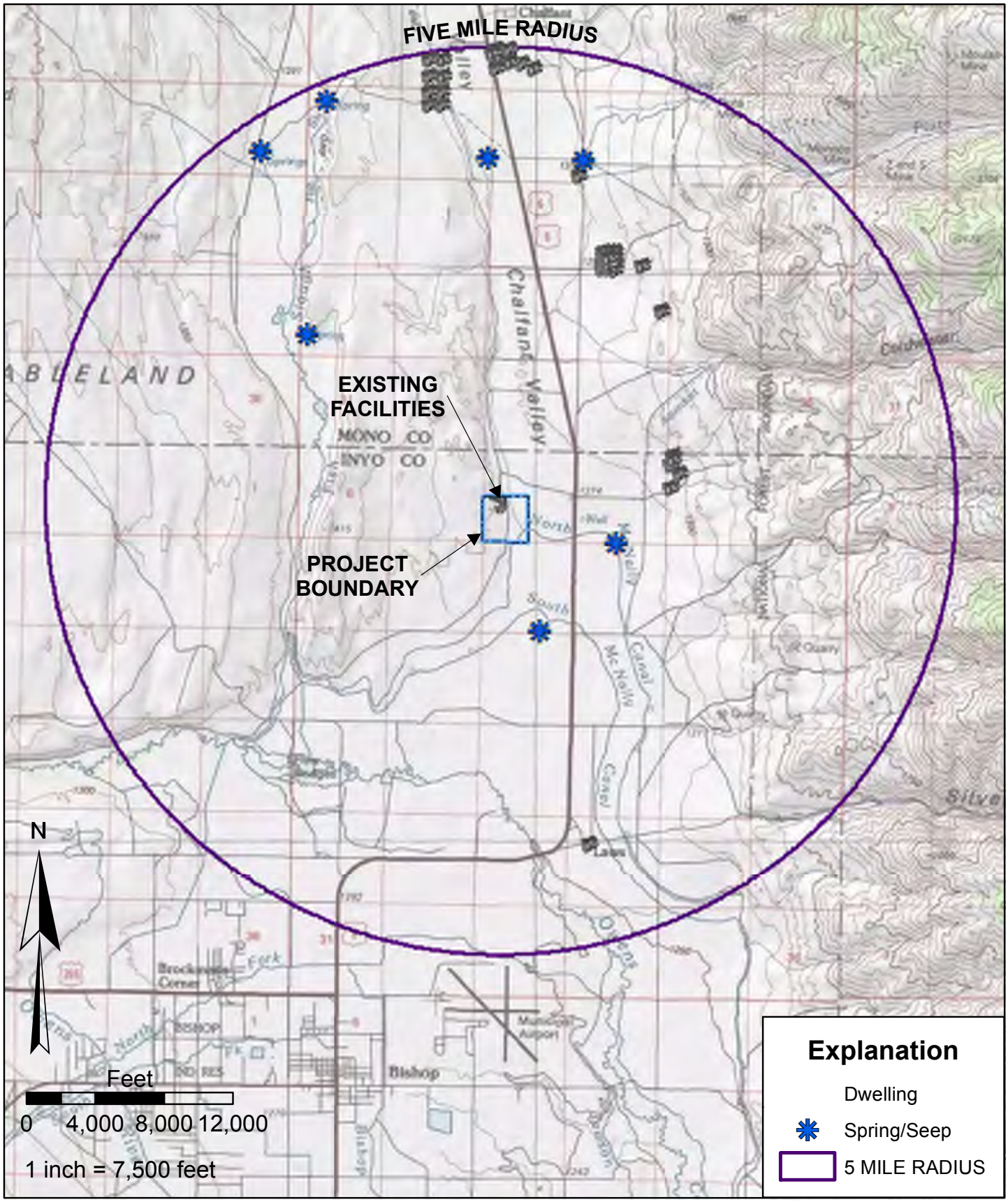
BISHOP MILL
REPORT OF WASTE DISCHARGE
INYO COUNTY, CALIFORNIA

HOLOCENE FAULTS

DRAWING NO. **FIGURE 2-3**

REVISION NO. **A**



BISHOP MILL			BISHOP MILL REPORT OF WASTE DISCHARGE INYO COUNTY, CALIFORNIA	SPRINGS, SEEPS, WATERWAYS, GROUNDWATER FLOW DIRECTION, AND DWELLINGS	
DESIGN: MB	DRAWN: JQG	REVIEWED: -		DRAWING NO. FIGURE 2-4	REVISION NO. A
CHECKED: -	APPROVED: MB	DATE: 11/15/2010			
FILE NAME: WDP_Fig2-4_FiveMile_JQG_20101026					

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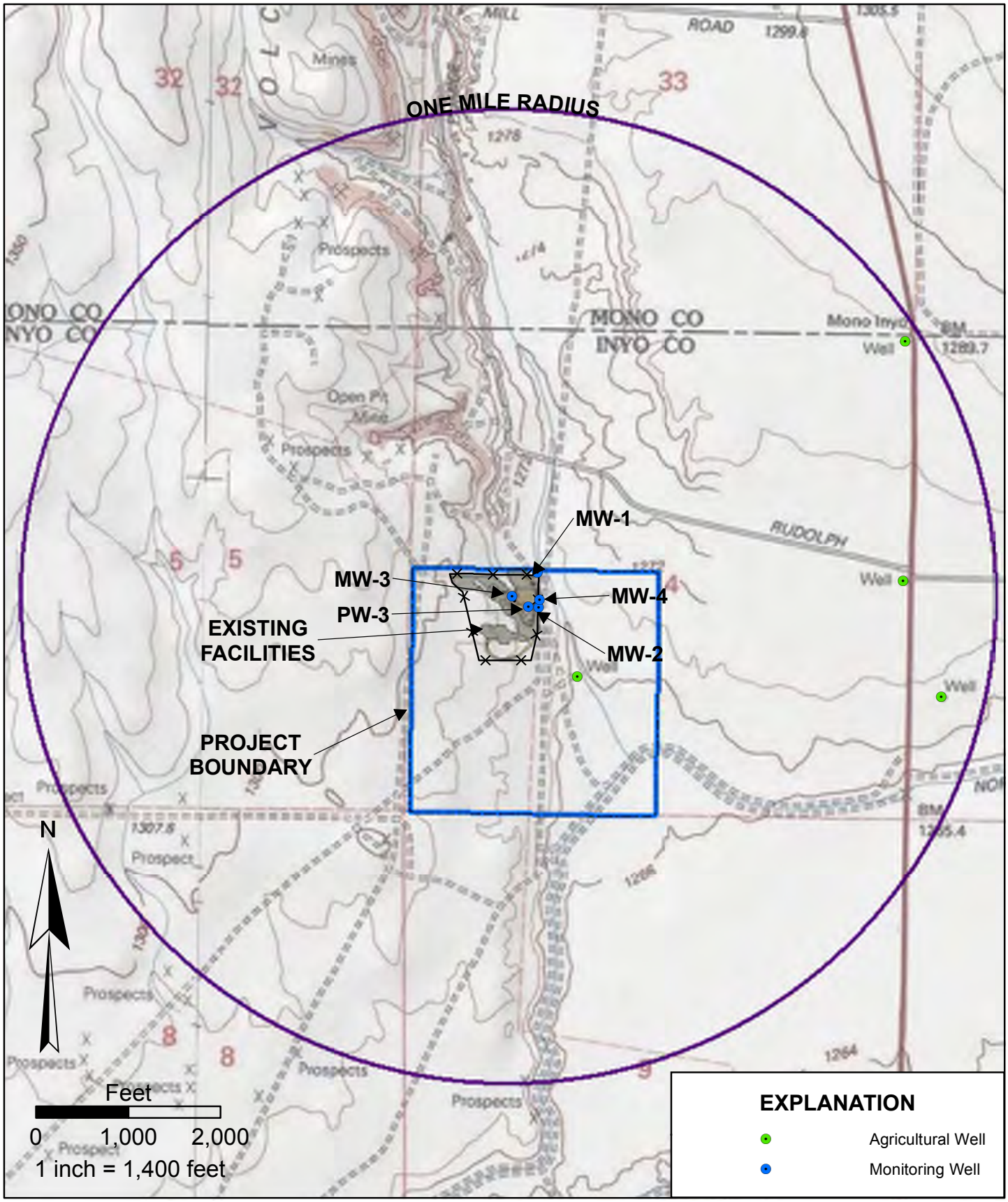

BISHOP MILL			BISHOP MILL REPORT OF WASTE DISCHARGE INYO COUNTY, CALIFORNIA	DRAWING TITLE: WELLS WITHIN ONE MILE	
DESIGN: MB	DRAWN: JQG	REVIEWED: -		DRAWING NO. FIGURE 2-5	REVISION NO. A
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FILE NAME: WDP_Fig2-5_Wells_JQG_20101026					

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3 Proposed Project Operation

The proposed Project operation includes stockpiling, processing via crushing and gravity separation, and disposal of tailings. No mining or chemical processing of ore will take place at the Project site, though some chemicals may be used during the gravity separation floatation process. Project operations are described in this section. Design and construction of the proposed WMU is described in Section 5.

The proposed operations include the following activities:

1. Importation of ore from off-site sources, stockpiling (and potential pre-screening for oversize material) on the existing concrete Ore Patio;

2. Ore processing, including crushing, screening and flotation, of up to 96 tons of ore per day (4 tons per hour, 24 hours per day) through the gravity separation mill;

3. Disposal of tailings via slurry deposition within a double-lined pond (WMU) with leakage collection and recovery system (LCRS).

Ore for processing will arrive in over-the-highway haul trucks and will be off-loaded at the existing concrete Ore Patio and/or the temporary ore stockpile area northwest of the Ore Patio. If larger diameter rocks are present, the ore may be processed through a grizzly screen with a front-end loader where large rocks would be saved for later mechanical breaking or removal from the Project site and transport back to the ore source location.

3.1 Ore Processing

Screening, grinding, flotation and gravity separation circuits are located within the Mill building. The main components include a primary/secondary crusher, Krupp and shaker screens, mills, classifier, flotation cells, and filtering system. Currently there is an electrolytic winning system within the mill buildings west of the WMU, but it not proposed for use as part of the process proposed herein. The mill process components are shown on the process flow diagram in **Figure 3-1**.

Raw gold-silver-copper ore is imported to the Project and stockpiled on the concrete Ore Patio, located just above the mill building. The concrete-lined Ore Patio measures 40 feet by 80 feet, and provides capacity for approximately 1,000 tons of ore storage, or equivalent to two weeks of mill feed at full production capacity.

The raw ore will be loaded into the ore feed bin (25-tons capacity) by a front end loader, then gravity fed to the mill at the rate of approximately 4 tons per hour, or approximately 96 tons per 24-hour shift.

The ore is then fed to a primary jaw crusher (10-inch × 20-inch) and crushed to ½ inch diameter, then to a secondary cone crusher to further reduce the rock size to ¼- inch diameter. The ore is then transferred to the fine ore bin (40-ton capacity) via a bucket elevator. Ore is moved from the fine ore bin to a 4-foot by 8-foot Krupp screened discharge mill that reduces the ore feedstock to minus 10 mesh. The discharge will be gravity concentrated on a 10 inch by 12 inch duplex jig. Overflow from the jig will be sent to the rake classifier where the over size (plus #150 mesh) will go to the 5-foot × 4-foot ball mill for further size reduction to minus #150 mesh, and the application of the first flotation reagents in the process circuit.

A general collector, Xanthate 350, is drip fed into the ball mill at the rate of ½ milliliter (pre-diluted in water at ½ lb. per gallon) per ton of ore. Two additional reagents are drip fed into the ball mill at this time: Aero 208 (a free gold collector) and Aero 31 (a sulfide collector) at the rates of one milliliter per minute (pre-diluted at 2 cups per gallon) and ¾ milliliter per minute, respectively (60 and 40 milliliters per ton equivalent). Soda Ash is added to the ball mill as necessary to maintain the pH at +6.8 s.u.

The outflow from the ball mill goes to a rake classifier, which returns the oversize material back to the ball mill for additional grinding. Once all ore is reduced to an acceptable size and size classified in the rake classifier, it is transported to the conditioning tank where the flotation reagent chemicals are allowed to mix for 30 minutes, creating chemically charged ore slurry.

The chemically charged ore slurry is then conveyed to the No. 1 rougher/flotation cell where a frothing agent, Aero Froth, is introduced at the rate of 1/3 milliliter per minute (20 milliliters per ton equivalent), to facilitate the recovery of the metallic particles. The flotation cells, with the addition of frothing agents, create an agitated air-infused froth. The air bubbles collect the chemically charged metallic particles and bring them to the surface of the cell. Each cell in the system collects the frothed metallic particles and transports them to the concentrate/flotation cell. It is following this stage that the barren tailings solids are discharged to the impoundment while the concentrate containing the processing reagents and precious metals is piped to the thickener tank. The thickener tank de-waters the concentrate, allowing most of the additive chemicals to be re-circulated back into the processing system for recycling. The filtered and air dried concentrate is then loaded in drums and shipped off site for refining.

The tailings from the flotation cells are passed from the last flotation cell to the Launderer tray that feeds the Deister gravity recovery shaker table where metallic particles that were too large or heavy to be recovered by the flotation process are recovered in the table high-line concentrate. At the Launderer tray, the reagent Shaklee's Basic H is added at the rate of ½ gallon (diluted to 1/8 cup per gallon) per hour as a surfactant to reduce the water's surface tension and condition the ore for the gravity table. The Basic H breaks down any remaining floatation reagents, allowing the heavy metal particles to sink. The table concentrates are then air dried and shipped off site for refining.

From the table, the residual tailings are piped to the tailings pond (WMU) located adjacent to the mill building. Refer to **Figure 3-1** for a process flow diagram of the mill process.

Throughout the milling process, approximately 1,000 gallons of water is used per ton of ore, or up to 96,000 gallons per day at maximum capacity. A large portion of the required process water will recycled at the thickener tank and the remaining water will be reclaimed from the tailings pond (WMU) after the tailings are allowed to settle out. Clarified supernatant fluid will be recycled from the tailings impoundment via a floating barge-mounted pump. Although most of the water will be recycled, there will be some loss due to evaporation - this will be replenished from the on-site production well, as needed.

The only proposed change to the existing process system is currently to produce concentrates without processing to the metal state. Also, the installation of a Krupp Screen to increase the efficiency of the grinding process is proposed. The addition of the Krupp screen will require the construction of a concrete pad on the southwest side of the existing Mill building where shown on **Drawing 204600.010-102** in **Appendix A**.

3.2 Tailings Disposal

In order to facilitate construction of the proposed new tailings WMU, approximately 100 tons of tailings previously deposited in the existing pond will be excavated and temporarily placed on the Ore Patio with a truck and excavator. A section of the existing 40-mil liner in the existing tailings pond will be cut and placed on top of the concrete Ore Patio prior to placing the tailings. Another section of liner will be used to cover the tailings pending completion of the new WMU and re-processing of this material. The plastic will be secured with sand bags or tires. An earthen berm will be constructed around the Ore Patio to divert stormwater run-on and contain stormwater runoff from the ore stockpile

The existing tailings pond will be removed and the subsurface soils sampled to confirm that all tailings have been removed prior to initiating construction of the new WMU. Contaminated soils overexcavated from the base of the pond will be stockpiled with the tailings removed from the base of the pond and reprocessed with them.

The new tailings disposal facility has been designed and constructed in accordance with Title 27 regulations for Group A mine waste disposal. The design of the WMU is described in **Section 5**.

Tailings will be deposited via direct discharge at a constant level 3 feet below the embankment crest. Discharge locations will be varied to maximize areal distribution and depositional densities within the WMU. HDPE wear sheets (scraps of 80mil HDPE) will be used at all discharge locations to protect the primary liner. Wear sheets will be anchored at the pond crest by either welding to the existing liner or constructing a second anchor trench outside the pond crest. Wear sheets will be inspected weekly and replaced as necessary to protect the primary pond liner.

The maximum storage level for tailings and water will be 2 feet below the crest to accommodate storm events and wave action. Supernatant water will be reclaimed via a floating barge pump and pipeline back to the Mill.

3.3 Ancillary Facilities and Project Operations

The following ancillary facilities are located within the Project boundary:

1. Main Mill building,
2. Warehouse,
3. Garage,
4. Trailer (office and laboratory),
5. Production well (PW-3),
6. Propane tank,
7. Perimeter fence,
8. Powerline, and
9. Monitoring wells (MW-1 and MW-2).

No changes are proposed for ancillary facilities at the Project. Existing topography and facilities are shown on **SRK Drawing 204600.010-101** in **Appendix A**.

3.3.1 Buildings

The main Mill building, garage, office and laboratory trailer are proposed to remain in their current condition. All reagents are currently stored in the Mill building. The existing warehouse is used for materials and supplies, small equipment and concentrate storage.

3.3.2 Power

Electrical power is supplied by Southern Edison via an existing above ground power line. The mill operates on 440 volt, three-phase power. Other facilities on site operate on 220- and 110-volt power.

3.3.3 Water Supply

Water is supplied via on-site production well PW-3. The production well is located south of the existing tailings pond, as shown on **SRK Drawing 204600.010-101** in **Appendix A**.

3.3.4 Roads

Roads at the Project are generally unimproved gravel or compacted earth surfaces and include the primary access road from the entrance gate to the warehouse and Ore Patio, in addition to several other interconnected roads within the project boundary. Roads are generally 15-25 feet wide.

3.3.5 Fuel Storage

An existing portable 500-gallon, double-walled fuel tank mounted on a steel stand will be used to store diesel fuel for use in Project equipment. The stand will be placed in an area with secondary containment (lined with plastic) to contain any leaks or spills. Used oil and used coolant will be

stored in the garage in separate 55-gallon drums placed on a secondary containment spill pallet (Eagle 195-9858 4-Drum Secondary Containment & Spill Control Pallet or equal) or similar system designed for secondary containment of drums. Drums will be removed periodically by a licensed rendering company. New motor oil will be stored in plastic one-quart or five-quart bottles in the garage.

3.3.6 Chemical and Reagent Storage

All process-related reagents are stored within the Mill Building. Reagents used at the Project are listed in **Table 3-1** below. If additional reagents not on this list are proposed for use at the Project, a revision of this list will be submitted to the LRWQCB and the BLM prior to use. Copies of the Material Safety Data Sheets (MSDS) for each chemical will be maintained on-site.

Table 3-1. Reagents, Volumes and Shipments

Reagents	Storage	Amount/Delivery	Trucks/Year	Reportable Quantities (40 CFR 302.4)
Aero Float 208 Promoter	55 gal. Drum	55 gal. Drum	6	--
Aero Float 31 Promoter	55 gal. Drum	55 gal. Drum	6	--
Xanthate 350	55 gal. Drum	55 gal. Drum	6	--
Shaklee Basic “H”	500 lbs	500 lbs	6	--
Sodium Carbonate (Soda Ash)	500 lbs	500 lbs	6	--
Orfom F2 Frother	55 gal. Drum	55 gal. Drum	6	--
Methyl Iso Butyl Cobonal	55 gal. Drum	55 gal. Drum	6	--
Pine Oil	55 gal. Drum	55 gal. Drum	6	--
Highway Diesel	500 Gallons	500 Gallons	12	25 gallons unless sheen on water
Propane	1,000 gal. tank	1,000 gal.	12	--
Motor Oil	50 quarts	50 quarts		--
Used Oil	55-gal drum	55-gal drum	2	25 gallons unless sheen on water
Used Coolant	55-gal drum	55-gal drum	2	--

3.3.7 Stormwater Management

Best Management Practices (BMPs) will be used to limit erosion and reduce sediment in precipitation runoff from Project facilities and disturbed areas during construction, operations, and initial stages of reclamation. BMPs may include, but are not limited to, diversion and routing of stormwater using accepted engineering practices, such as diversion ditches, and the placement of erosion control devices such as sediment traps, and rock and gravel cover. The design of the proposed diversion channel upgradient from the WMU is described in **Section 5.5.4**.

Revegetation of disturbed areas will reduce the potential for wind and water erosion. Following construction activities, areas such as cut and fill embankments and growth media stockpiles will be seeded as soon as practical. Concurrent reclamation will be maximized to the extent practical to accelerate revegetation of disturbed areas. All sediment and erosion control measures will be inspected periodically, and repairs performed as needed.

3.3.8 Sanitary and Solid Waste Management

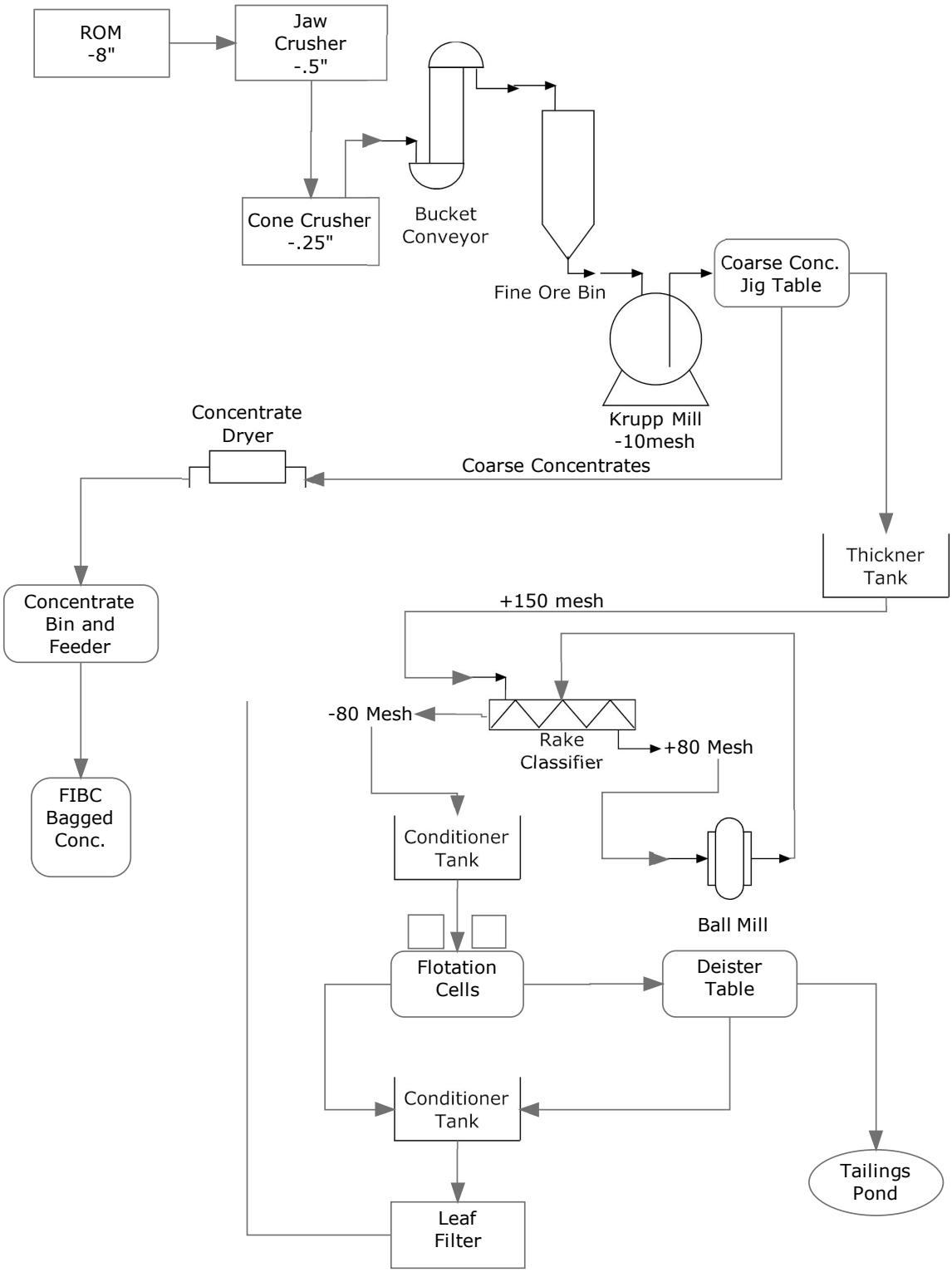
The Operator does not currently operate a sanitary septic system. Instead the Operator will maintain portable toilets onsite, approximately one for every five employees. The waste from each unit will be pumped and disposed by a local septic disposal contractor. The Operator does not currently operate a landfill. Instead, all solid waste will be stored in a small roll-off bin or other trash bin and regularly collected by a licensed hauler and transported to a permitted solid waste management facility for proper disposal. Employee training will include appropriate waste management practices.

3.3.9 Equipment Requirements

Figure 3-1 shows a process flow diagram of the mill building and the equipment proposed for use. The existing garage is used for maintenance and storage of equipment. General mobile equipment such as dozers, trucks, loaders, excavators, and water trucks will be utilized for construction, operations, and reclamation and supplied on a contractor basis.

3.3.10 Dust Suppression

Air quality permits will be obtained for Process components (as required) and land disturbance requiring permits from the Great Basin Unified Air Pollution Control District. In general, dust control measures employed at the Project will include the application of water to roads and other disturbed areas as required. Fugitive emissions in the process area will be controlled at the crusher and conveyor drop points using water sprays and/or negative air pressure dust collection where necessary. Pollution control equipment will be installed, operated and maintained in good working order to minimize emissions.



BISHOP MILL			
DESIGN: MB	DRAWN: JQG	REVIEWED: -	
CHECKED: -	APPROVED: MB	DATE: 10/26/2010	
FILE NAME: WDP_Fig3-1_MillProcess_JQG_20101026			

BISHOP MILL
REPORT OF WASTE DISCHARGE
INYO COUNTY, CALIFORNIA

DRAWING TITLE:
PROPOSED FLOW DIAGRAM OF MILL PROCESS CIRCUIT

DRAWING NO. **FIGURE 3-1**

REVISION NO. **A**

Path: H:\CMC Metals (Bishop Mill)\204600.010_Bishop_Mill_Waste_Discharge_Permit\040_Drafting\WDP_Fig3-1_MillProcess_JQG_20101026.mxd

4 Ore Characterization

4.1 Environmental Setting

Known sources of ore anticipated to be processed at the Project include ore from the Gold Bug Mine, Darwin Mine, and the Radcliffe Mine in the Ballarat Mining District in south-central Inyo County, California. Other sources of ore may need additional evaluation prior to determining the acceptability at the facilities.

4.1.1 Geology of Known Ore Sources

The mining district which incorporates the Gold Bug and Radcliffe Mine is underlain by schist, dolomatic limestone, and gneiss of Precambrian age, which in places have been cut by granitic dikes. The ore deposits consist of quartz veins containing free gold and occasionally abundant sulfide (Clark, 1970).

4.1.2 Ore Mineralogy and Description of Major Lithologies

A sample of ore from the Gold Bug mine was analyzed by Phelps Dodge Mining Company and Sunshine Mining Company. The results were reported by Roger W. Smith Consulting Geologist (2005).

The Goldbug mine consists of two distinct vein systems and mineralogies. The lower vein system contains vein quartz and consists of free gold in an iron-stained white quartz with calcite and trace copper carbonates, manganese oxides and barite. The upper vein system contains sulfide ore containing free gold, and silver, lead, copper and iron sulfide.

Because mining at the Radcliffe mine has not advanced into the gold bearing vein, descriptions of the ore are not yet available. It is expected that the gold bearing veins will be similar to that described for the Gold Bug Mine.

Ores from the Darwin Mine area are noted for the great variety of minerals. The Darwin ore is associated with a copper bearing skarn that hosts a high grade copper-silver-zinc deposit. The primary sulfides are mostly galena, sphalerite, pyrite; less common are pyrrhotite and chalcopyrite. Argentiferous galena is the principal ore mined, along with sphalerite. Scheelite is fairly common, sometimes in considerable concentration.

Precise mineralogy has not been identified for other potential ore resources at this time.

4.2 Geochemical Characterization Program

As detailed in Title 27, Division 2, Subdivision 1, Chapter 7, Subchapter 1, Article 1, 22500, SWRCB – Water Quality Monitoring for Mining Units. (C15: Section 2573), New and existing Group A and B Mining Units shall comply with the monitoring provisions contained in section

20385 through section 20430. A discharger subject to this article shall conduct a monitoring and response program, approved by the LRWQCB, for each Unit at the facility in accordance with detection monitoring requirements under section 20420.

As detailed in Section 20420. SWRCB – *Detection Monitoring Program. (C15: Section 2550.8) (b) Standards - The discharger subject to this section shall install water quality monitoring systems that are appropriate for detecting, at the earliest possible time, a release from the Unit, and that comply with applicable provisions of section 20415*.

The purpose of this Geochemical Characterization Plan is to determine the potential impacts to water resources by the processing of ore obtained from off-site locations and to characterize certain materials for their potential impacts to the environment.

Various ore is proposed to be transported from off-site locations and processed at the Bishop Mill. Tailings waste generated from processing will be contained in a new Group A mining waste management unit. The geochemical characteristics of the ore proposed for processing will be evaluated prior to transport to the Bishop Mill. This Geochemical Characterization Plan will, therefore, be administered by the Operator to identify the geochemical characteristics representative of each ore body identified for processing and eventual disposal in the new tailings WMU.

In order to monitor the effectiveness of the containment system, and satisfy the requirements identified in the Detection Monitoring Program, the Operator proposes the following sampling and analytical program to assist in detecting, at the earliest time, a release from the proposed tailings WMU.

4.2.1 Sampling and Analytical Program

The Sampling and Analytical Program will consist of monitoring two components, groundwater chemistry and leachable solutes obtained from offsite ore sources in order to help identify potential constituents of interest to area water resources. Monitoring of surface water resources is not applicable, and therefore, not proposed at this time.

Geochemical Characterization of Offsite Ore

Monitoring of the beneficiation process will include the routine characterization of the ore that is transported from off site to the Bishop Mill facility. Representative ore samples for each source and/or lithological variant of ore that is shipped to the site will be collected for analysis prior to processing. Each sample will be submitted to a certified laboratory for leachable solutes (Meteoric Water Mobility Procedure and Acid Base Accounting analyses or equivalent).

4.2.2 Results and Data Evaluation

The samples identified above will be analyzed by a California-certified laboratory according to the analyte constituent profiles proposed in **Table 4-1**. Analytical results will be compared to the established background groundwater quality in order to identify trends or potential impacts to groundwater quality resulting from processing of off-site ore. The analytical results will be provided to the LRWQCB as specified in the final WDRs.

Table 4-1. Proposed Analytical Parameters

Alkalinity (as $CaCO_3$)	Boron	Lead	Potassium
Bicarbonate	Cadmium	Magnesium	Selenium
Total	Calcium	Manganese	Silver
Aluminum	Chloride	Molybdenum	Thallium
Antimony	Chromium	Nickel	Sodium
Arsenic	Cobalt	Mercury	Sulfate
Barium	Copper	Nickel	TDS
Beryllium	Fluoride	Nitrate	WAD Cyanide
	Iron	pH	Vanadium
			Zinc

5 Waste Management Unit Design

The waste management unit will be a double-lined pond with a leakage collection and recovery system. The WMU will be approximately 25 feet deep with internal pond sideslopes configured at 2H:1V to maximize storage capacity within the available disturbed area footprint. The top surface area at the inside pond crest is approximately one acre (43,000 square feet). The sideslopes and base of the WMU will be compacted to a minimum of 90 percent of maximum dry density at ±2 percent of optimum moisture content as determine by ASTM D1557, modified Proctor testing.

WMU construction tasks are anticipated to include the following:

1. Remove a section of the 40-mil liner for use at the Ore Patio to underlay and cover the relocated tailings;
2. Remove the existing tailings (approximately 100 tons) to the Ore Patio and cover them with an additional layer of liner;
3. Remove and dispose of the remaining 40-mil liner in a permitted municipal solid waste facility;
4. Conduct confirmation sampling in base of pond to ensure that all tailings have been removed, including coordination with BLM and LRWQCB to establish success criteria for tailings removal;
5. Re-construct the pond area to the proposed new double-lined WMU with 2H:1V sideslopes pond and a leak detection and recovery system (LCRS) system;
6. Moisture condition and compact new WMU base and sideslopes to a minimum of 90 percent of maximum dry density at ±2 percent of optimum moisture content per ASTM D1557, modified Proctor testing – compacted density of existing pond sideslopes and base to be confirmed and reconstructed as required to meet Technical Specifications;
7. Smooth roll final compacted soil surface and remove protrusions that could damage liner;
8. Excavate LCRS sump, overliner seepage collection drain sump, and liner anchor trenches around pond perimeter;
9. Place 60-mil Agru Super GripNet geomembrane secondary liner over compacted WMU base and sideslopes;
10. Place 6-inch diameter PVC pipe and clean drain gravel in sump;
11. Place geotextile over the gravel-filled sump (to protect primary liner);
12. Place 80-mil smooth HDPE liner over secondary liner;
13. Backfill and compact liner anchor trenches;
14. Construct overliner seepage collection drain and riser;
15. Construct up-gradient diversion berm around the top of the upgradient slope cut to divert the 100-year, 24-hour storm.

5.1 Regulatory Requirements

The waste management unit at the site is governed by the requirements of Division 2 – Solid Waste, Chapter 7 – Special Treatment, Storage and Disposal Units, Subchapter 1 – Mining Waste Management of Title 27 of the California Code of Regulations (CCR). These regulations are administered by the Lahontan Regional Water Quality Control Board (LRWQCB) through the issuance of waste discharge requirements (WDRs), applicable to the owner or operator of a waste management unit for the treatment, storage, or disposal of mining waste.

5.2 Purpose and Need

On April 15, 2010, BLM granted an extension to Pruett Ballarat, Inc., the former operator of the Bishop Mill site, establishing a deadline for submittal of an application for a Waste Discharge permit. The extension was granted subsequent to the submittal of an Amended Plan of Operations for the project under 43 CFR Parts 3809.401. In accordance with the extension, BLM required the submittal of a detailed engineering design for a Group A WMU to the LRWQCB by June 30, 2010. The Operator has prepared this Report of Waste Discharge and detailed design report to satisfy BLM's directive and obtain approval to construct and operate the proposed new waste management unit.

5.3 Site Conditions Affecting Design

Section 2 of this Report of Waste Discharge describes the existing environment of the site, including a detailed description of site climate, geology, and hydrogeology. The following sections describe how those site conditions were utilized in the design of the WMU.

5.3.1 Climate

Meteorological data described in **Section 2.3** were utilized in developing the water balance described in **Section 5.5.2**, which was subsequently used to evaluate the operation of the proposed tailings pond and the potential for fluids to evaporate once operations cease. Precipitation frequency data were used to develop a peak flood hydrograph and design the diversion channel described in **Section 5.5.4**.

5.3.2 Soils and Seismicity

Site soil data presented in Section 2.4.2 were combined with seismic data presented in Section 2.4.4 to evaluate the stability of the proposed WMU embankment.

5.3.3 Depth to Groundwater

Static groundwater was reported at about 25 feet below the base of the WMU based on the results of a hydrologic investigation of the site completed by SRK in October 2010. The investigation report is included in **Appendix C** and discussed in more detail in **Section 2.5**. Based on the relatively shallow groundwater beneath the proposed WMU, the WMU has been designed with

double-synthetic liners and a leakage collection and recovery system. The design is described below and shown on the design drawing set in **Appendix A**.

5.4 Siting

This section addresses the location of the waste management unit with respect to the following siting requirements of CCR 27, Division 2 – Solid Waste, Chapter 7 – Special Treatment, Storage and Disposal Units, Subchapter 1 – Mining Waste Management, Article 1 – SWRCB Mining Waste Management Regulations, Section 22490 – Mining Unit Siting and Construction Standards:

a) Proximity to faults; and

b) Flooding.

5.4.1 Faults

Several faults run through the Chalfant Valley, within which the site is located, including the Fish Slough fault, approximately 2 miles west of the site, and the White Mountain range front fault, approximately 2 miles east of the site. Based on the seismic data presented in **Section 2.4.4** above, there are no Holocene faults mapped within the Project area.

5.4.2 Flooding

The nearest perennial source of surface water is Pumice Creek, located approximately 1.5 miles to the east, and Fish Slough, located approximately 2 miles to the west. The Bishop Mill site is not located within a 100-year floodplain.

A diversion channel and berm will be constructed upgradient from the WMU. The diversion channel/berm has been designed to divert the run-off generated from a 100-year, 24-hour storm on the upgradient watershed around the WMU. Refer to **Section 4.4** for a discussion of site stormwater controls.

5.5 Design Approach

The existing pond at the Bishop Mill site will be expanded within the existing disturbed footprint to maximize the available storage capacity for tailings disposal. The existing pond is approximately 150 feet by 190 feet at its crest and approximately 20 feet deep with 2H:1V (horizontal to vertical) sideslopes. The new WMU will utilize as much of the existing configuration as possible, but will be approximately 5 feet deeper at the same sideslope ratio and expand to the north within the existing disturbed area using the existing fence and access road as boundary limitations. The proposed layout of the new WMU has crest dimensions of approximately 185 feet by 240 feet, and is illustrated on **SRK Drawing 204600.010-102** in **Appendix A**.

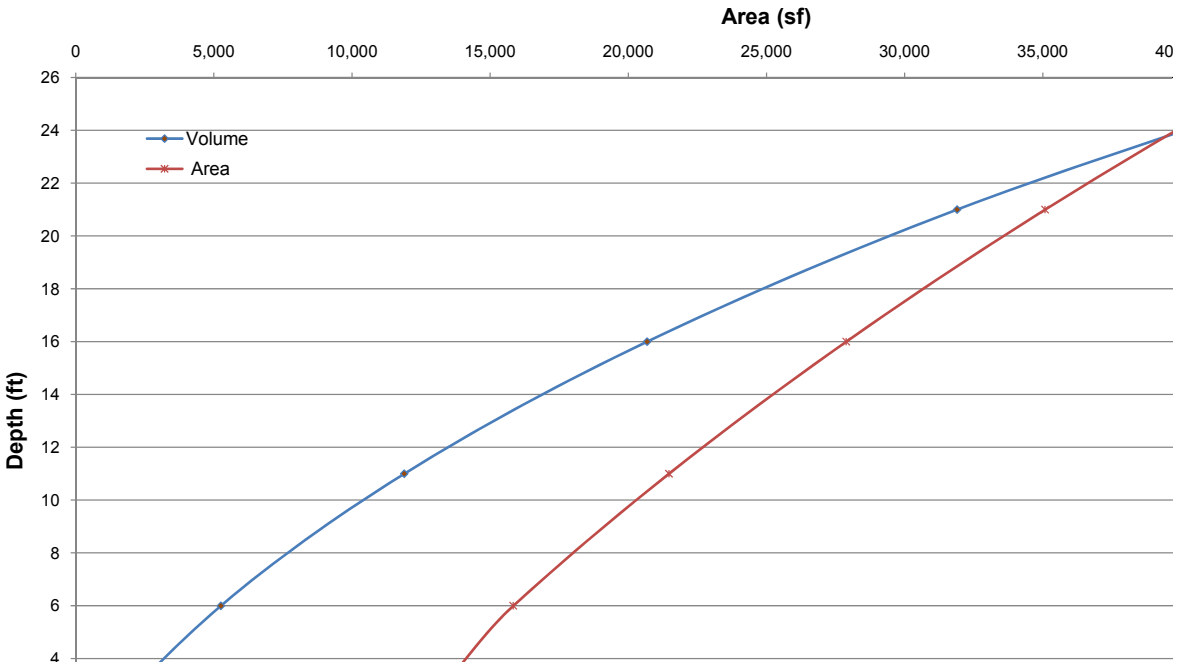
The discharge pipe from the mill to the tailings impoundment and the reclaim water pipe back to the mill will both be constructed as pipe-in-pipe such that the outer leak detection pipe will gravity drain back into the WMU. Required pipe size will be determined by the Operator, but will be one of the following combinations: 2-inch HDPE inside 4-inch HDPE; 3-inch HDPE inside 6-inch HDPE; or 4-inch HDPE inside 8-inch HDPE. An HDPE wear strip shall be installed at the discharge location into the WMU, and wherever else required to protect the liner from abrasion. Wear sheets will be anchored at the pond crest by either welding to the existing liner or constructing a second anchor trench outside the pond crest. Wear sheets will be inspected monthly and replaced as necessary to protect the primary pond liner. The following sections describe the basis of the WMU design.

5.5.1 Storage Capacity

Tailings will be deposited via direct discharge at a constant level 3 feet below the embankment crest. Discharge locations will be varied to maximize beaching (if feasible) and depositional densities within the WMU. HDPE wear sheets (scraps of 80mil HDPE) shall be used at all discharge locations to protect the primary liner.

The maximum storage level for tailings and water shall be 2 feet below the crest to accommodate storm events and wave action. Stage versus capacity and area characteristics of the proposed expanded tailings pond are shown on **Figure 5.1**. As shown on **Figure 5.1**, the design configuration provides adequate capacity for storage of around 550,000 cubic feet of tailings up to the freeboard level 2 feet below the inside crest. The estimated total capacity of dry tailings is approximately 24,000 tons, assuming a dry density of 85 pounds per cubic foot (pcf).

Figure 5-1. Stage vs. Area and Capacity Curve



5.5.2 Water/Solids Balance

A water/solids balance spreadsheet was developed to evaluate the anticipated operational life of the proposed WMU under various operating assumptions and to determine the post-operational water balance of the WMU to facilitate closure. The water balance spreadsheet is included in **Appendix E** and provides the following data:

1. Anticipated end of month tailing surface elevation.
2. Monthly Inflows:
   a. Maximum monthly slurry water inflow based on 96 tons/day of dry solids at 85 pcf - this ceases when operations cease;
   b. Average monthly runoff from the lined tailings area (runoff coefficient of 1) and the upstream watershed (runoff coefficient of 1) - the runoff coefficients are conservative to simulate highest possible runoff under average conditions.
3. Outflows:
   a. Monthly evaporation losses from tailings surface area;
   b. Water remaining entrained in tailings solids (20% of solids volume) - this ceases when operations cease; and
   c. Required monthly reclaim water pumpback and make-up water rates based on reclaiming the difference between inflow and outflow volumes over the duration of the month - this ceases when operations cease.

Based on the results of the water and solids balance, the proposed WMU design will accommodate as few as 8 months of operation at the maximum operating rate of 4 tons per hour,

or as much as 2.5 years at an average operating rate of 1 ton per hour. In addition, the water balance also shows that once the operation ceases, the remaining pool inventory in the WMU will be evaporated within two seasons. Actual WMU life and operating conditions will vary from the assumptions necessary to complete the water balance, and will depend primarily on the availability and characteristics of ore for processing.

5.5.3 Stability Analyses

Static and pseudo-static analyses of the stability of the critical pond embankment section were performed using the computer program SLIDE (Version 5.026). SLIDE is a 2-D slope stability analysis program designed for evaluating the factor of safety or probability of failure of circular or non-circular failure surfaces in a defined slope. SLIDE analyzes the stability of slip surfaces using vertical slice limit equilibrium methods (e.g., Bishop, Janbu, Spencer, etc). Defined surfaces can be analyzed, or random search methods can be applied to locate the critical slip surface for a given slope under both static and pseudo-static conditions.

In the pseudo-static approach, a sustained horizontal force is applied to simulate inertial forces due to earthquake motions. The horizontal inertial force is estimated as a fraction of the weight (vertical force) by a horizontal pseudo-static seismic coefficient. This approach is applicable to slope materials that don't liquefy or lose shear strength with seismic shaking (Seed, 1979). The WMU will be double-lined with leakage collection and recovery systems and the potential for seepage through the embankment and subsequent liquefaction or shear strength reduction is therefore considered negligible.

The eastern embankment of the proposed tailings waste management unit was analyzed for its stability based on the maximum height of the embankment along the eastern side and the relatively steep downstream slope (refer to the east end of cross sections A-A and B-B on **SRK Drawing 204600.010-103**) .

The WMU embankment will be constructed using on-site native soils. The soil laboratory test results described in **Section 2.4.2** were therefore used to define the soil properties in the SLIDE model (refer to **Appendix F**), as summarized in **Table 5-2**.

Table 5-2. Summary of Material Properties for SLIDE Analyses

Material	Parameters		
	Unit Weight (pcf)	Cohesion (psf)	Friction angle (degree)
Native Soil (Scenario 1)	90	74	26
Native Soil (Scenario 2)	106	119	35
Tailings (Scenarios 1 & 2)	115	0	0

Two scenarios were simulated as follows:

- Scenario 1: embankment material is similar to blended sample TP1/ TP3; and
- Scenario 2: embankment material is similar to blended sample TP1/TP2.

Each analysis considered the tailings to have no shear strength and a saturated unit weight of 90 pcf. Both scenarios were evaluated using static and pseudostatic analyses, resulting in a total of four stability runs.

Output files for the SLIDE analyses are included in **Appendix F**. The results of the static and seismic slope stability analyses are summarized in **Table 5-3** and indicate that the proposed WMU configuration is stable under both static and pseudostatic conditions.

Table 5-3. Summary of Slope Stability Results

Scenario	Circular Failure	
	Static Condition	Pseudostatic Condition
1	1.63	1.06
2	2.29	1.50

The SLIDE output files are included in **Appendix F** of this report.

5.5.4 Stormwater Diversion

The 100-year, 24-hour inflow design storms was considered in completing the design of the upgradient diversion channel, as summarized below. Storm precipitation depths for 24-hour storm events were obtained from the National Weather Service website as described **in Section 2.3** – a copy of the web site printout is included in **Appendix G**.

A hydrologic analysis was performed by SRK Consulting to estimate the peak flow rate for runoff from the relatively small upgradient watershed using the Natural Resource Conservation Service's WinTR-55 method (version 1.0.08, USDA, 2005). The predicted peak flows were then used in conjunction with the FlowMaster computer program (Haestad, 2005) to design and size a channel to route runoff around the WMU. Run-on flow from the west will be diverted around the WMU to both the north and south in a proposed 18-inch deep v-ditch diversion channel with 2.5:1 (H:V) sideslopes. **SRK Drawings 204600.010-102** and **104** in **Appendix A** show the limits of the upgradient watershed analyzed and the channel alignment and configuration. The output results of the WinTR-55 and FlowMaster modeling are provided in **Appendix G**.

5.5.5 Overliner Seepage Collection System

The WMU design incorporates an overliner seepage collection system to facilitate dewatering the deposited tailings to maximize deposited densities. Details of the overliner seepage collection system are provided on **SRK Drawing 204600.010-104**. The operating life of the WMU will

directly depend on the ability to maximize deposited densities. For the purposes of water balance and design preparation, a deposited density of 85 pound per cubic foot was assumed. Actual deposited densities will vary and will be significantly affected by operational controls such as discharge locations and reclaim rates.

In order to maximize the potential to remove interstitial moisture from the tailings and increase consolidation, an overliner seepage collection system consisting of a perforated pipe with overlying sand and gravel drain wrapped in geotextile will be installed over the primary liner. The perforated pipe will drain into an overliner sump. Seepage collecting in the sump will be pumped via submersible pump onto the surface of the impoundment and either evaporate or be reclaimed back to the process.

5.6 Construction Standards

This section addresses the construction standards of the mining waste management unit (tailings pond) with respect to the following requirements of CCR 27, Division 2 – Solid Waste, Chapter 7 – Special Treatment, Storage and Disposal Units, Subchapter 1 – Mining Waste Management, Article 1 – SWRCB Mining Waste Management Regulations, Section 22490 – Mining Unit Siting and Construction Standards:

a) Construction and discharge standards;
b) Registered professionals;
c) General containment structure criteria;
d) Liners;
e) Leakage collection and removal system;
f) Precipitation and drainage controls; and
g) Incorporated impoundment requirements.

Additional information is provided regarding the Technical Specifications and Construction Quality Assurance Manual prepared to direct the initial and final closure construction.

5.6.1 Construction and Discharge Standards

In accordance with Table 1.3 and Figure 1.1 in 27 CCR Section 22490, the design of the expanded Bishop Mill Group A mining waste management unit (tailings pond) includes a double synthetic liner with a leakage collection and recovery system (or leakage collection and removal system). Design details are shown on the drawings in **Appendix A**.

The proposed double liner system incorporates a primary 80mil smooth HDPE liner over a secondary 60mil HDPE Agru Super Gripnet geomembrane. Alternatively, the secondary liner may include a geonet and 60mil smooth HDPE liner in lieu of the Agru Super GripNet product, depending on pricing and availability.

The leakage collection and recovery system will include a gravel-filled sump constructed within the pond base between the primary and secondary liners. A 6-inch diameter PVC or HDPE pipe

will be bedded within the gravel sump and will include a slotted or perforated section within the gravel. Details of sump construction are shown on the drawings in **Appendix A**.

5.6.2 Registered Professionals

The design of the WMU has been prepared by, or under the direct supervision of, the following professional engineer registered in the State of California.

R. Breese Burnley, Principal Engineer
California R.C.E. No. C60507
SRK Consulting (U.S.), Inc.
5250 Neil Road, Suite 300
Reno, Nevada 89502
(775) 828-6800

Construction of the waste management unit shall be supervised and certified by a California-registered civil engineer or certified engineering geologist.

5.6.3 General Containment Structure Criteria

In utilizing two synthetic-liners comprised of HDPE, the design of the Bishop Mill WMU exceeds the requirements of Section 20320 – General Criteria for Containment Structures. The containment design of the WMU is shown on the design drawings in **Appendix A** and described in **Section 5.1**.

5.6.4 Liners

The proposed double liner system incorporates a primary 80mil smooth HDPE liner over a secondary 60mil HDPE Agru Super GripNet geomembrane. Alternatively, the secondary liner may include a geonet and 60mil smooth HDPE liner in lieu of the Agru Super GripNet® product, depending on pricing and availability. Product information for Agru Super GripNet® is included in **Appendix H**.

The anticipated operational life of the WMU (tailings pond) is on the order of 5 years, which is much less than the life expectancy of HDPE geomembrane, typically considered to be in excess of 25 years in exposed conditions, and in the hundreds of years in buried applications (Renken et al., 2003). In addition, the tailings deposited on the liner will be primarily silt and fine-grained sand up to a depth of 25 feet, and will, even when loaded during closure construction, pose no threat of puncture to the geoembrane. Based on this, the proposed liner will perform as designed during the active life of the site. In addition, the WMU will be closed as a landfill in accordance with 27 CRR Sections 21410 and 21090.

5.6.5 Leak Collection and Removal System (LCRS)

The Bishop Mill WMU has been designed with a standard leak collection and removal system (LCRS) in accordance with 27 CCR Section 22490(g) and 20340. The LCRS will consist of a 10-foot by 10-foot by 2-foot deep gravel-filled sump constructed between the primary and secondary

liners. It will be accessed by a 6-inch diameter PVC or HDPE riser pipe laid between liners along the pond sideslope. At the surface, the riser pipe will be booted into the primary liner and capped. A perforated section of pipe will either be fitted to the end of the riser pipe or the end of the pipe will be manually perforated to form a hydraulic connection to the gravel-filled sump. The LCRS sump will be inspected regularly in accordance with the monitoring plan in the Report of Waste Discharge. When present, fluids collecting in the sump will be evacuated back into the WMU at a frequency that minimizes head on the secondary liner.

5.6.6 Precipitation and Drainage Controls

There are no collection or holding facilities planned for the control of stormwater at the Bishop Mill facility. The operating level of the WMU shall be maintained at all times lower than two feet from the embankment crest to provide for storage of incoming precipitation.

Stormwater diversion is described above and will consist of the construction of a v-ditch diversion channel on the slope above the WMU to divert stormwater from a relatively small 0.4-acre watershed north and south of the WMU.

5.6.7 Incorporated Impoundment Requirements

The Bishop Mill WMU shall be operated such that there is a minimum of two feet of freeboard below the embankment crest at all times to accommodate at least the 25-year, 24-hour storm event (2.94 inches) falling within the pond perimeter. Given the relatively small surface area of the impoundment, wave action is not anticipated to be significant and will be accommodated by the 2-foot freeboard requirement. The Operator will develop a specific plan of operation designed to eliminate the potential for overfilling and will provide a copy to the LRWQCB. Exposed portions of the WMU liner shall be inspected weekly for signs of damage or wear and repaired promptly as required.

5.6.8 Technical Specifications and Construction Quality Assurance

Technical Specifications for WMU construction are included in **Appendix I**, while a Construction Quality Assurance Plan is presented in **Appendix J**. The CQA plan will be implemented by an independent third party during both initial construction and final closure construction to verify that construction complies with approved construction drawings, specifications, and the CQA Plan. CQA activities will be completed under the supervision of a registered Civil Engineer or certified Engineering Geologist in the State of California. All CQA documentation will be presented in the final As-Built Report for the site.

6 Monitoring Program

The Operator has prepared the following detection monitoring program to identify specific points within the project WMU and environmental management program that will be routinely monitored for potential impacts to water resources by the processing of ore at the Bishop Mill Project; and to characterize certain materials for their potential to impact the environment. California-certified laboratories will be used for all analytical testing. The types of samples, the locations from which samples are collected, the parameters to which samples are analyzed and the frequency in which samples are collected are described in the following sections.

6.1 Liner Inspection

The WMU liner will be visually inspected on a weekly basis for any indication of excessive wear, wrinkles, rips or tears. Any observed breaches in liner integrity shall be repaired as soon as possible. If necessary, processing operations will be terminated to accommodate liner repairs.

Wear sheets comprised of 80mil liner scraps or other approved material shall be placed below tailings discharge points and shall be anchored either by welding to the existing primary liner or by constructing a new dedicated anchor trench outside the primary anchor trench. Wear sheets shall be inspected weekly during inspections of the WMU liner and shall be replaced as often as required to protect the primary liner from abrasion or damage.

6.2 Detection Monitoring Program for Waste Management Unit

Under Title 27, Chapter 3, Subchapter 3, Article1. SWRCB - Applicability. (C15: Section 2573.0) – New and existing Group A and B Mining Units shall comply with the monitoring provisions contained in Sections 20385 through 20430.

In order to comply with SWRCB monitoring guidelines for the WMU, the Operator proposes to conduct monitoring of the new WMU leakage collection and recovery system (LCRS) and groundwater monitoring in Project monitoring wells to detect the occurrence of a release, and, should a release be detected, assess potential impacts to groundwater quality resulting from Project operations, specifically those associated with processing and management of tailings in the WMU.

6.2.1 Leakage Collection and Recovery System

The tailings WMU will be double lined and equipped with a leakage collection and recovery system (LCRS). Details of this system are provided in **Appendix A**. The LCRS will operate to collect any fluid resulting from possible failure of the primary WMU liner, and report it directly to the LCRS sump where it can be regularly evacuated without release to the environment. The LCRS will be the earliest possible detection of a release from the tailings WMU. Based on the

proposed double lined system with leak detection and LCRS, vadose zone monitoring is not proposed.

6.2.2 Monitoring Wells

Groundwater monitoring wells will be used to supplement the detection and collection capabilities of the tailings WMU LCRS in identifying potential releases and assessing potential impacts to local groundwater resources. Although there are four wells used for monitoring groundwater (MW-1, MW-2, MW-3 and MW-4), the Operator understands only one set of water quality samples have been collected from these wells to date. As such, the Operator proposes to begin sampling all four monitoring wells on a quarterly basis to better characterize the existing groundwater conditions and improve the existing monitoring program for the Bishop Mill. Laboratory analyses will include those constituents identified in **Table 4-1**. Quarterly monitoring will continue until the existing ground water is sufficiently characterized to form a basis for future detection monitoring efforts, at which time the Operator may propose a shorter list of detection parameters at an alternative monitoring frequency.

6.2.3 Reporting

Prior to initiation of operations, the Operator will adopt and/or develop standardized forms for the collection and reporting of inspection and monitoring data. For each inspection, measurement, or sample collected, the forms will include, at a minimum, the following information:

- Place, date, and time of inspection, observation, measurement, or sampling;
- Person(s) conducting the inspection, observation, measurement, and/or sample collection;
- Comments regarding any problems/repairs;
- Dates of analyses and name of laboratory; and
- Analytical results.

These forms will be summarized and provided to the LRWQCB and BLM. The forms will be maintained onsite and will be made available for review upon request.

The Operator will submit quarterly reports on or before the 28th day of the calendar month following the reporting quarter. These reports will include the analytical results.

The above data will be summarized in an annual report, which will be submitted to the LRWQCB on or before the 28th day of February of each calendar year.

Analytical methods to be employed will conform to 40CFR§136, Guidelines Establishing Test Procedures for the Analysis of Pollutants. Sample collection, handling, preserving, and transporting of samples will be conducted in conformance with established U.S. Environmental Protection Agency (EPA) protocols, as appropriate.

Hydrogen ion activity (pH) analyses will be performed in the field, as well as by the analytical laboratory, to accuracy reliable to 0.05 standard units (s.u.). The analytical method for constituents with maximum contaminant levels (MCL) shall have a detection level less than or equal to one-half of the MCL. All other analyses shall be reported in mg/L, reliable to two significant digits. A laboratory certified by the State of California will perform all analyses.

6.3 Water Quality Protection Standard

At this time, it is not clear if background water quality has been officially established by the LRWQCB. The Operator understands only one complete set of ground water samples have been obtained from the Project monitoring wells (MW-1, MW-2, MW-3 and MW-4). These wells were established after the initial operations began. **Table 2-3** summarizes detections of constituents analyzed in August 2008. There were no detections of the other constituents analyzed. The results indicate that the water quality is good and generally meets California Maximum Contaminate Levels (MCL) for Drinking Water with the exception of slightly elevated concentrations of antimony. Since the available water quality data are generally within the California MCL for drinking water, the Operator proposes that the August 2008 analytical data be designated as representative of background water quality, and therefore it will also be proposed as the water quality protection standard for the Project.

6.3.1 Constituents of Concern

The proposed background groundwater quality generally meets California Drinking Water MCLs. Therefore, those constituents identified by the California Department of Health Services "Criteria of Inorganic Constituents of Hazardous Waste", as listed in **Table 6-1** below, will form the list of constituents of concern for the proposed WMU.

Table 6-1. Department of Health Services Criteria for Inorganic Constituents of Hazardous Wastes

Substance	Threshold Limit Concentration	
	Soluble (STLC) mg/L In Extract	Total (TTLC) Wet Wt. mg/kg
Antimony and/or Antimony Compounds	**15**	500
Arsenic and/or Arsenic Compounds	5.0	500
Barium and/or Ba Compounds (excl. Barite)	100	10,000
Beryllium and/or Beryllium Compounds	0.75	75
Cadmium and/or Cadmium Compounds	1.0	100
Chromium (VI) Compounds	**5**	500
Chromium and/or Chromium (III) Compounds	560	2,500
Cobalt and/or Cobalt Compounds	80	8,000
Copper and/or Copper Compounds	25	2,500
Fluoride Salts	180	18,000
Lead and/or Lead Compounds (inorganic)	5.0	1,000

Mercury and/or Mercury Compounds	0.2	20
Molybdenum and or Molybdenum Compounds	**350**	3,500
Nickel and/or Nickel Compounds	20	2,000
Selenium and/or Selenium Compounds	1.0	100
Silver and/or Silver Compounds	5	500
Thallium and/or Thallium Compounds	7.0	700
Vanadium and/or Vanadium Compounds	24	2,400
Zinc and/or Zinc Compounds	250	5,000

6.3.2 Concentration Limits

The Operator proposes Concentration Limits be based on those minimum reporting limits designated by the EPA and certified California Laboratory as well as the Project protection standards proposed for the constituents of concern.

6.3.3 Monitoring Points and Point of Compliance (POC)

Two groundwater monitoring wells were installed under the 2005 Plan of Operations and were intended to support the then-constructed tailings pond. Two additional wells were installed during the Hydrogeologic investigation completed in October 2010. The Operator intends to designate these wells MW-1, MW-2, MW-3, and MW-4 as shown on **SRK Drawings 204600.010-101** and **102**, as Project monitoring points of compliance. In addition, the Operator proposed to monitor the new LCRS monitoring port. The Operator does not propose to establish any additional POCs for the tailings WMU at this time.

6.4 Action Leakage Rate (ALR) and Rapid and Large Leak Rate (RLL)

The action leakage rate (ALR) and rapid and large leak rate (RLL) will be considered the rate and volume of any discharge to the LCRS. The response and required action necessary to address a discharge into the LCRS will be the same for both the ALR and the RLL. Any fluid observed in the LCRS sump will be immediately pumped back into the WMU where it will be managed with the pond inventory. The Operator will make every effort to locate the leak and implement repairs. If the leakage rate exceeds the capacity of the LCRS sump, processing operations will be halted pending maintenance of the WMU. Operations will only resume once the leak has been located, the liner repaired, and with LRWQCB approval.

6.5 Corrective Measures

Corrective measures shall be determined by the LRWQCB should the board find the Operator in violation. The Operator assumes full responsibility to operate, close, and reclaim the Project per regulation and in an environmentally responsible manner. All stormwater controls will be maintained through the life of the Project.

7 Quality, Operation and Contingency Plans

The WMU will be sited and constructed according to Section 22490. SWRCB – Mining Unit Siting and Construction Standards. (C15: Section 2572). The Operator proposes to operate as ore becomes available. The Operator proposes to stockpile up to 1,000 tons ore and process at a rate of 96 tons per day.

7.1 Quality Control/Quality Assurance

Technical Specifications and a Construction Quality Assurance (CQA) manual have been prepared to guide construction in accordance with established criteria. Both documents were prepared under the direct supervision of a California-registered civil engineer and are included in **Appendices I** and **J**. The CQA plan will be implemented by an independent third party during construction to verify that the WMU construction complies with the approved design, construction drawings, specifications, and the CQA plan. CQA activities will be completed under the supervision of a registered Civil Engineer or certified Engineering Geologist in the State of California. All CQA documentation will be presented in the final construction certification report.

7.2 Contingency Plans

If the Operator cannot use the WMU for some unforeseen circumstance, the Operator will cease processing operations until such time as the situation is rectified and approval to continue Project operations is obtained from LRWQCB. The Operator does not propose to continue ore processing and develop an alternative disposal location to address the potential for a WMU shutdown.

7.2.1 Detection of Foreseeable Releases to the Vadose Zone

The WMU will be double-lined and equipped with a leakage collection and recovery system. The LCRS will collect any fluid resulting from failure of the WMU's primary liner system and report it directly to a sump so it can be managed without release to the environment. The LCRS will be the earliest possible detection of a release from the WMU. Based on the WMU design, vadose zone monitoring is not proposed.

7.2.2 Detection of Foreseeable Releases to Surface Water Channels

The Bishop Mill tailings WMU has been designed to contain up to 32,000 tons of tailings. The WMU will be operated in a similar manner as a pond in that a minimum of two feet of freeboard will be maintained at all times. This freeboard will be more than sufficient to accommodate direct precipitation within the pond perimeter and the upgradient watershed. As such, the Project has been designed and will be operated as a zero-discharge facility. Therefore, it is not anticipated that a release occur outside the pond to a surface water body.

7.2.3 Foreseeable Releases to Groundwater

As described above, the WMU will be double-lined and equipped with an LCRS as described in the above sections. It is not anticipated a release to groundwater would occur. A monitoring program has been prepared and described herein to assess the effectiveness of the WMU, LCRS, and detect through monitoring of Project groundwater quality potential releases to groundwater.

7.2.4 Foreseeable Releases Mitigation

The Operator has taken the design precautions necessary to ensure the best protection possible from a release to the environment from the WMU. However, if a release did occur, the Operator would develop a detailed plan to include the following actions:

1. Characterization of Release;
2. Installation of Additional Monitoring Wells (completed);
3. Groundwater Sampling and Analysis (performed quarterly);
4. Monitoring Natural Attenuation;
5. Final Cover Construction (completed);
6. Maintenance; and
7. Reporting.

7.2.5 Financial Assurance Cost Estimate for Foreseeable Release Scenarios

As described above, and based on the WMU design with a double liner and LCRS system, the Operator has not prepared a mitigation plan for a foreseeable release or an associated cost estimate. If a release from the WMU does occur, the Operator will develop a detailed mitigation plan and associated cost estimate for the implementation thereof.

8 Closure and Post-Closure Maintenance Plan

As detailed in 22510. SWRCB – Closure and Post Closure Maintenance of Mining Units. (C15: Section 2574), Mining Units shall be closed according to an approved closure and post-closure maintenance plan which implements this section and provides for continued compliance with the applicable standards in this article for waste containment, precipitation, and drainage controls, and monitoring through closure and the post closure maintenance period.

8.1 Purpose

New and existing WMUs shall be closed so they no longer pose a threat to water quality. No post closure land uses shall be permitted that might impair the integrity of containment structures. Surface management regulations 43 CFR §3809.420 establish the performance standards that apply to the Plan of Operations. Reclamation of disturbed areas resulting from activities outlined in a Reclamation Plan will be completed in accordance with BLM regulations. Closure and post-closure maintenance as well as those surface management activities propose are summarized in the sections below.

8.2 Schedule

The proposed Project will be active for approximately 5 years of active operation. One year beyond that date may be anticipated for closure activities, and final reclamation. Groundwater monitoring will be conducted for three years beyond final reclamation. This schedule may be modified based on the rate of mining and future commodities prices. Closure and concurrent reclamation will be ongoing over the life of the mine in areas that have reached their final configurations.

8.3 Tailings Waste Management Unit

In accordance with 27CCR Section 22510(l) Tailings Pond Closure Standards, the Bishop Mill WMU will be closed as a landfill in accordance with the provisions of 27CCR Section 21090(a - c) and 27CCR Section 21400(a).

Following removal and/or evaporation of all stored inventory, the final surface of the WMU will be covered with a minimum of 2 feet of compacted native borrow soil to form a final cover foundation layer. It will be graded to achieve an approximate 5 percent slope from the central north-south axis of the pond to the east and west perimeters. Refer to **SRK Drawing 204600.010-104** for details of closure.

Over the prepared foundation layer, the Operator proposes to employ a final cover layer comprised of 60 mil linear low-density polyethylene (LLDPE) Agru Drain Liner® overlain by 8 ounce-per-square-yard geotextile for drainage. Drain Liner® is a three-dimensional geomembrane with studs on one side to promote drainage. Product information is included in

Appendix H for reference. The geotextile will be heat-burnished to increase rigidity and placed over the studded side of the Drain Liner® to provide for drainage of the overlying soil layer. The overlying soil layer will be comprised of a minimum of 18 inches of compacted native soil placed in loose lifts not exceeding 12 inches in thickness and compacted to a minimum of 85 percent of maximum dry density at optimum moisture content (per ASTM D1557).

Following final cover placement and finish grading, the cover layer will be lightly scarified and seeded with a native seed mix recommended by the Bureau of Land Management and designed to limit rooting depth to an average of 18 inches or less.

Technical Specifications and a Construction Quality Assurance Manual will be prepared for closure as part of the Final Closure Plan. Both documents will be prepared under the direct supervision of a California-registered civil engineer.

Closure construction for most elements of the closure design will be performed by a licensed contractor. It is anticipated that the contractor will use wheel loaders, dump trucks, belly dumps, a sheepsfoot and/or vibrating roller compactor, water truck, and motor grader to complete closure activities. It is also anticipated that the contractor will furnish his own equipment. All equipment will be operated by experienced personnel. Only areas which require grading and covering will be disturbed and a water truck will be used at all times to aid in compaction and minimize the generation of fugitive dust. If necessary, commercial dust suppressants will be employed in the dust control operations.

During construction of the final cover layer, a survey crew will verify that the cover has been constructed to the prescribed elevations and dimensions in accordance with the approved plans and specifications. Prior to contractor mobilization, the surveyor will establish grade stakes on a 50-foot by 50-foot grid throughout the site to be used for vertical control during cover construction.

8.3.1 Residual Un-Processed Ore

If stockpiled ore remains unprocessed after operations have terminated, the residual ore material will either be sold and transported offsite or will be disposed of in the WMU and covered with a minimum of 24 inches of growth medium.

8.3.2 Neutralization of Leached Residues

The liner of the WMU will remain for reclamation and permanent closure of the Project. Water remaining in the WMU will be allowed to evaporate. The remaining tailings will be allowed to dry and will then be covered with a minimum of 24 inches of growth medium and seeded.

8.3.3 Sampling and Analyzing the Tailings and Groundwater

Tailings will be fully contained, managed, and closed in the tailings WMU. No post-closure sampling or analysis of tailings are proposed at this time. Post-closure groundwater quality will

be monitored according to the requirements established by LRWQCB with the goal of demonstrating the Project poses no potential to degrade waters of the State.

8.3.4 Reporting

The Operator will submit to the LRWQCB quarterly reports which will include a summary of the data described in the monitoring program and groundwater sample analytical results. The BLM will be copied on the quarterly reports and will receive reports on an annual basis detailing revegetation efforts and success until the success criteria determined by the BLM has been fulfilled.

8.4 Mill and Stormwater Control Structures

The closure, reclamation plan, and reclamation cost estimate describe activities and costs associated with the demolition and disposal of all buildings and ancillary facilities to establish a land use similar to adjacent undisturbed lands. All reagents, chemicals and other hazardous or toxic chemicals will be removed from the Project. Any above surface pipelines will be removed. Underground pipelines will be capped and left in place. Power poles will be cut off at ground level and removed. Perimeter fences will also be removed.

8.4.1 Mill

Prior to demolition, the Mill will be rinsed with fresh water to remove any residual ore and reagents. The rinse water will be directed to the WMU and allowed to evaporate. Salvageable materials will be removed from the site. Materials which are unsalvageable and meet the solid waste disposal criteria will be disposed of in the nearest permitted municipal solid waste management facility. Concrete foundations and stem walls will be demolished to natural grade, broken up to allow drainage through slab foundations and buried in place. Native soil borrow will be used to fill subgrade portions of the foundations. The disturbed area will be scarified and seeded with an approved reclamation seed mix.

8.4.2 Stormwater Control Structures

As described in **Section 5**, the only stormwater control proposed as part of the WMU design is a small upgradient diversion berm along the top of the WMU's cut-slope. The diversion berm will be maintained until the WMU is fully closed and revegetation success is sufficient to warrant removal of the diversion berm.

8.4.3 Final Topography

The final topography of the Project will include a backfilled and mounded WMU configuration designed to accommodate settlement and consolidation while fitting in the existing topography. Slopes will be regraded with mobile equipment (dozers, trucks, loaders, scrapers) to blend with surrounding topography, interrupt straight-line features and facilitate revegetation, where practical.

8.5 Post-Closure Monitoring and Maintenance

Following Project closure, berm and sign maintenance, Project inspections, and any other necessary monitoring for the period of reclamation responsibility will be conducted. Monitoring of vegetative success will be conducted annually until the revegetation standards have been met, and will include noxious weed monitoring and abatement, as necessary. Post-closure groundwater quality will be monitored according to the requirements established by LRWQCB with the goal of demonstrating that the Project poses no potential to degrade waters of the State. Revegetation monitoring will be conducted for a minimum of three years following implementation of revegetation activities or until revegetation success has been achieved. Revegetation monitoring will occur based on seasonal growth patterns, precipitation, and weather conditions. Noxious weed monitoring and control will be implemented for a three-year period.

8.6 Cost Estimate

An estimate of reclamation cost has been provided to the BLM as part of an Amended Plan of Operations for the Bishop Mill. Courtesy copies were provided to LRWQCB. The cost estimate includes costs for reclamation of the anticipated full operation which is the amount that the Operator post bond to obtain authorization for resumption of milling. The estimates have been calculated using the Nevada Standardized Reclamation Cost Estimator (SRCE) version 1.1.2.

9 Reclamation Plan

Reclamation of disturbed areas resulting from activities outlined below will be completed in accordance with BLM and California Surface Mining and Reclamation Act regulations. The purpose of Subpart 43 CFR 3809 – Surface Management is to prevent unnecessary or undue degradation of public lands by operations authorized by the mining laws. Anyone intending to develop mineral resources on public lands (including mineral beneficiation on mill-site claims) must prevent unnecessary or undue degradation of the land and reclaim disturbed areas. This subpart establishes procedures and standards to ensure that operators and mining claimants meet this responsibility and provide for the maximum possible coordination with appropriate state agencies to avoid duplication and to ensure that operators prevent unnecessary or undue degradation of public lands by operations authorized by the mining laws.

The Project disturbance areas are summarized in **Table 9-1**. The areas proposed for disturbance can be divided into the following: roads, buildings, tailings, and yard areas.

Table 9-1. Estimated Proposed Disturbance

Project	Public (ac)	Private (ac)	Total (ac)
Roads	1.37	0	1.37
Buildings	0.29	0	0.29
Yards	6.0	0	6.0
Tailings	1.47	0	1.47
Total	**9.13**	**0**	**9.13**

9.1 Regrading

The final grading plan for the Project is designed to minimize the visual impacts of the disturbance proposed by the Operator. Slopes will be regraded with mobile equipment (dozers, trucks, loaders, scrapers) to blend with surrounding topography, interrupt straight-line features and facilitate revegetation, where practical. Appropriate equipment for reclamation will be dozers, excavators, and graders or equivalent.

9.2 Roads

Following completion of milling activities, roads will be regraded to match existing topography, scarified, and seeded with an approved reclamation seed mix. Roads and safety berms will be recontoured or regraded to approximate the original contour. Roads without a defined post-mining use will be reclaimed concurrent with Project operation if feasible.

9.3 Processing and Support Buildings

All buildings and facilities associated with the Project will be removed during the salvage and demolition phase. Most of the building materials will be salvageable and will therefore be removed from the site. Those materials which are unsalvageable and meet the solid waste disposal criteria will be disposed of in the nearest permitted municipal solid waste management facility. Concrete foundations and stem walls will be demolished to natural grade, broken up and buried in place with a minimum of 12 inches of native soil.

Prior to demolition, the various components of the Mill will be rinsed with fresh water to remove any residual ore and reagents. The rinse water will be directed to the tailings WMU and allowed to evaporate.

All reagents, chemicals and other hazardous or toxic chemicals will be removed from the Project. Any above surface pipelines will be removed. Underground pipelines will be capped and left in place. Power poles will be cut off at ground level and removed. Perimeter fences will also be removed.

9.4 Yard Areas

Yards are considered miscellaneous flat surface disturbances at the Project and include parking areas, laydown areas, building footprints and surrounding disturbed areas. Following completion of milling activities, the yard areas will be regraded to match the existing topography (flat), scarified, and seeded with an approved reclamation seed mix.

9.5 Tailings WMU

Upon cessation of milling, any remaining water in the new tailings WMU will be allowed to evaporate. In accordance with 27CCR 22510(l) Tailings Pond Closure, a 24-inch foundation layer of cover material will be placed on the tailings. This will be overlain by a 60-mil Linear Low Density Polyethylene (LLDPE) membrane to create an impermeable layer over the tailings. An 8-ounce geotextile material will be placed over the entire surface, covered with a minimum of 18 inches of growth media, and the surface will be regraded to drain water away from the center of the WMU at a nominal 5% grade. The surface will be seeded with the reclamation seed mix. Soils salvaged from stockpiled excess soils from pond construction and the near-surface alluvial material may be used as soil cover materials during reclamation.

9.6 Drill Hole Plugging and Water Well Abandonment

Monitoring wells will be maintained until the Operator is released of this requirement by the LRWQCB. These wells will then be plugged and abandoned according to Chapter II, Section 23 of the California Department of Water Resources Southern District Water Well Standards.

9.7 Revegetation

Areas requiring revegetation will be broadcast seeded by hand or small equipment. Seedbed preparation and seeding will take place in the fall. The seeds will then be covered using a wire harrow. Areas requiring additional seedbed preparation would be scarified with the wire harrow prior to seeding. Hand broadcast seed would be covered by harrowing or raking.

9.8 Financial Assurance

The Operator hereby agrees to assume responsibility for the reclamation of any surface area affected by the operations at the Bishop Mill Project. A reclamation cost estimate for the Project has been prepared based on the proposed operation described herein and includes an estimate for reclamation of the anticipated full operation. This cost estimate defines the amount that the Operator must post to obtain authorization for resumption of Project operations. The estimates have been calculated using the Nevada Standardized Reclamation Cost Estimator (SRCE) version 1.1.2.

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