CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

BOARD ORDER NO. R6V-2010-0047
WDID NO. 6B362098001

REVISED WASTE DISCHARGE REQUIREMENTS

FOR

MOLYCORP MINERALS LLC
MOUNTAIN PASS MINE AND MILL OPERATIONS

San Bernardino County

The California Regional Water Quality Control Board, Lahontan Region (Water Board) finds:

1. Discharger

For the purpose of this Water Board Order (Order), Molycorp Minerals LLC., (Molycorp) is referred to as the "Discharger." Molycorp submitted the following reports, which constitute a complete revised Report of Waste Discharge (RWD) for the Mine and Mill Operations:

- Revised Report of Waste Discharge (RWD) Molycorp Mine and Mill Site Paste Tailings Facility and Product Storage Impoundments, prepared by Molycorp Minerals LLC and TRC, March 2010.
- Response to LRWQCB [Water Board] Comments on Paste Tailings Storage Facility – Molycorp Minerals LLC. Mountain Pass Mine, San Bernardino County, April 23, 2010.
- Construction Quality Assurance (CQA) Plan for the Northwest Paste Tailings Disposal Facility, Mountain Pass, California, Golder Associates Inc., April 22, 2010.
- Sampling and Analysis Plan and Monitoring Well Installation Work Plan, Molycorp Minerals LLC and TRC, April 2010.
- Molycorp Minerals LLC Mountain Pass Mine Response to RWQCB [Water Board] Comments on Revised [RWD] Pit Lake Remediation and north Overburden Stockpile, April 23, 2010. [Includes Financial Assurance Cost Estimate, Molycorp Minerals LLC, Mountain Pass Mine, June 2009 Update]
- Final Environmental Impact Report for Molycorp, Inc. Mountain Pass Mine 30-Year Plan, prepared by ENSR International, June 2004.

2. Facility

The Discharger has operated an existing open pit mine with milling, beneficiation, and mineral recovery facilities for the economic extraction of lanthanide elements (bastnaesite). Initially, the ore is processed through the crusher and mill. During previous mining/milling operations, some of the finished rare earth products have been discharged to lined and unlined ponds on the mine property. The Discharger has discontinued discharge to these product storage ponds described in Finding No. 8.

Mining operations at the Mountain Pass area began in 1950. During prior mining and milling operations, the Discharger has discharged tailings waste (Mill Plant Slurry Waste) to unlined tailings ponds and wastewater ponds. Tailings ponds that have been closed and are regulated under separate Board Orders are listed in Finding No. 4. The Discharger also operates a groundwater treatment system that treats, recycles and disposes of contaminated groundwater from the extraction system, the open-pit lake, stormwater runoff, tailings seepage water, separations plant mineral recovery wastewater, and reclaimed tailings water and are regulated under a separate Order (see Finding No. 4).

For the purposes of this Order, the Facility consists of the 1) crusher/mill plants, 2) proposed paste tailings plant, 3) open pit mine (pit), 4) proposed lined Group B tailings waste pile – referred to as the north west (Paste) tailings disposal facility (NWTDF), 5) proposed lined Group B wastewater surface impoundments (referred to as the Reclaim Pond [including reclaim lined channel], and Clarification Pond), 6) existing lanthanum product storage ponds, 7) existing and proposed Group C mining waste rock (west and north overburden stockpiles), and 7) proposed tailings waste related piping and conveyance systems.

The Discharger has proposed to build lined Group B waste management units (WMUs) to contain Group B mining waste to provide additional disposal capacity to continue mining and milling operations for the next 30 years (30-year expansion) and is shown in Attachment "A," which is attached to and made part of this Order. Group B waste consists of tailings waste solids and tailings wastewater (discharged as paste tailings). A proposed paste tailings plant to be built approximately 500 feet east of the proposed lined tailings waste management unit referred to as the Northwest (Paste) Tailings Disposal Facility (NWTDF), will process the tailings prior to discharge as a paste to the NWTDF. The Discharger proposes to expand the existing Group C waste stockpile areas west and north of the open pit (west overburden stockpile, and north overburden stockpile), and expand the pit as a consequence of continued mining operations. See Mine Site map, Attachment "A."

3. Order History

Waste Discharge Requirements (WDRs) for discharge to waste management units associated with the mining and milling processing were previously adopted under Board Order No. 6-91-836 on June 13, 1991. That Order is superseded by this Order.

Board Order No. 6-91-836 required the Discharger to comply with 1984 revisions to California Code of Regulations (CCR), Chapter 15 (subsequently moved to CCR, title 27) pertaining to groundwater and unsaturated zone monitoring, groundwater quality protection standards, groundwater cleanup, requirements for assuring closure and post-closure maintenance, financial assurances, and discharge and containment requirements for the tailings waste and product ponds. Board Order No. 6-91-836 superseded Board Order No. 6-81-73 that was adopted September 19, 1981 for the Mountain Pass Mine operations.

4. Reason for Action

The Water Board is revising WDRs to reflect new ownership of the mine and mill facilities, associated land, and ongoing mining operations, which will result in new mining waste discharge sites. This revised Order approves revised Preliminary Closure Plans and cost estimates, and requires compliance with regulations contained in CCR, title 27, sections 22470 through 22510, and all those additional sections of title 27 that are incorporated by reference therein. This Order requires the Discharger to revise the Post-Closure Maintenance Plan and cost estimates to include a corrective action response to a potential release during the post-closure period for these new WMUs. This Order excludes discharge requirements covered under separate Board Orders for the North Tailings Pond P-16 (Board Order No. R6V-2004-0042), the old West Tailings Pond P-1 (Board Order No. 6-00-74), the Community and Company landfills (Board Order No. R6V-2006-0024); and the Domestic Wastewater Pond (Board Order No. 6-01-18).

5. Facility Location

The Facility is located on land owned by Molycorp Minerals LLC; the property boundary encompasses an area of approximately 2,222 acres (Mine Site). The Mine Site is north of and adjacent to Interstate 15, approximately 15 miles southwest of Primm, Nevada, and 30 miles northeast of Baker, California. The proposed project is in Section 13, T16N, R13E and Sections 30 and 31, T16N, R14E, San Bernardino Base Line and Meridian (SBB&M), as shown on Attachment "A." Approximate longitude 115.5321 degrees West, latitude 35.4779 degrees North.

6. Waste Streams

A description of the waste streams disposed at the Facility regulated by this Order are as follows:

a. Mining Waste Overburden

The existing west overburden stockpile (WOS) and north overburden stockpile (NOS), consist of overburden waste rock derived from the pit. The WOS and NOS will be expanded west and north, respectively. At present, the NOS occupies approximately 18 acres of land immediately north of the pit. Over the next 30 years of mining, the NOS will expand to a final footprint of 145 acres, covering a hilly area north and east of its current location. As a result of the variable topography in this area, the south face of the NOS will reach an ultimate height of approximately 200 feet above ground, while the north face will reach an ultimate height of approximately 50 feet above ground. A total of approximately 45 million tons of overburden are designated for placement in the NOS. The WOS will expand from its current 70 acres by approximately 100 acres and will be filled with about 59 million tons of overburden.

b. Mine Tailings Waste

The Discharger proposes to discharge tailings waste to lined waste management units. Dewatered tailings waste solids will be discharged as a thickened paste. The Discharger proposes to utilize a thickened, or "paste" technology, which dewaters the tailings prior to disposal. The thickening process removes over 75 percent of the water present in the influent tailings slurry stream from the mill, which is typically comprised of about 65 percent water. The result is a paste comprised of approximately 85 percent solids/15 percent water, with no excess/free water. As a result of the consistency of the paste material, tailings water is not expected to form ponds on the surface of the waste pile. Over time, consolidation of the paste tailings will occur, expelling the tailings pore water. Taking into account evaporative conditions and tailings geotechnical properties, the Discharger predicts that total seepage from the entire 95-acre facility will range from 4 to 8 gallons per minute (gpm), which would be collected at the base of the unit in the leachate collection layer and would subsequently be recycled to the milling operation. The paste tailings waste will also include residual mill reagents, and tailings paste amendments, which, as proposed, may include Portland cement (0.5 percent by weight). Primary mill reagents will include varying amounts of sodium carbonate, hydrochloric acid, sodium silica fluoride, lignin sulfonate, and Tall Oil (fatty acid).

The Discharger conducted field and laboratory analytical tests on paste tailings waste solids and tailings leachate to characterize the chemical constituents. Attachment "B," which is made part of this Order, provides results of chemical analyses of the paste tailings waste solids. With the exception of lead, the total concentrations of the various constituents in the paste tailings solid samples (amended and unamended) do not exceed the California Total Threshold Limit Concentrations (TTLCs), as defined in California Code of Regulations, title 22, section 66261.24.

Concentrations of constituents in the proposed paste tailings are comparable to the historical tailings waste solids previously tested and that were discharged to the North Tailings Pond P-16.

The Discharger conducted long-term (33-week period), leaching tests on paste tailings using the modified California Assessment Manual Waste Extraction Test (CAM-WET) method (deinoized water as the extractant liquid). Table 1 in this Order provides the range of analytical test results of selected constituents for the paste tailings solids (leachable portion), historical tailings pond water, and groundwater from upgradient monitoring well 93-1MW. Analyses of tailings waste solids indicates that the paste tailings are not acid generating.

c. Process Wastewater - Filtrate, Thickener Overflow, Sumpage Water

Water removed from the tailings solids during the filtration and thickener processes (expressed wastewater) is one component of the liquid waste stream. Sumpage waste will consist of process water that has been in contact with paste tailings and/or tailings dust generated during the filtration process. The Discharger has predicted that the waste characteristics of these process wastewaters will have the same water quality as the paste tailings waste leachate.

d. Mine-Related Waste Impacted Soils

Additional wastes may also include soils excavated during clean-closure of product storage or former disposal ponds, on-site soil remediation, and Mine Site development activities. Analyses of excavated soil from the Mine Site remediation work, conducted in 2005, demonstrated soil characteristics similar to tailings waste solids and was consolidated into former North Tailings Pond P-16 prior to its closure. The Discharger will be required to fully characterize and report on mine-related waste impacted soils with respect to site-specific constituents of concern. Approval by the Water Board is required prior to discharge of these soils to a suitable mining waste management unit.

TABLE 1. WASTE CHARACTERIZATION – GROUNDWATER QUALITY

Constituent/ Parameter	Paste Tailings Solids[1]	Tailings Pond Water[2]	Non-Impacted Groundwater[3]	Title 22 MCL[5]	Title 22[7] STLC
Alkalinity (as $CaCO_3$)	49 – 457	NR	232	NA	NA
pH (units)	7.2 – 10.99	5.4 – 8.4	7.58	7.5	
TDS (mg/L)	70 – 27,900	7800 - 17,000	372	500	NA
Arsenic (mg/L)	<0.005(ND) – 0.05	0.014 – 0.041	<0.003	0.01	5.0
Barium (mg/L)	<0.003(ND) – 2.08	0.068 – 4.7	0.1787	1	100
Boron (mg/L)	<0.02(ND) – 0.98	3 – 34	0.24	NA	NA
Chloride (mg/L)	<0.2(ND) – 14,000	2600 – 8,600	26.2692	250	NA
Chromium (mg/L)	<0.02(ND) – 0.07	0.028 – 0.034	0.01	0.05	5
Fluoride (mg/L)	1.09 – 62.4	35 – 110	0.81	2.0	180
Lead (mg/L)	0.0009 – 0.65	0.011 – 3.49	Detection < 25%[4]	0.015 [6]	5.0
Magnesium(mg/L)	0.66 – 219	<50 – 230	15.8387	NA	NA
Manganese(mg/L)	0.002 – 0.7	2.9 – 8	0.06	0.05	NA
Mercury (mg/L)	<0.0001(ND) – 0.0002	<0.0002(ND) – 0.00067	NA	0.002	0.2
Nitrate(as N) (mg/L)	0.05 – 563	<1 – 17	3.3327	10	NA
Strontium (mg/L)	3.58 – 548	1.5 – 1,600	0.3155	NA	NA
Sulfate (mg/L)	5.5 – 1,261	83 – 1,000	46.4545	250	NA
Radium total (pCi/L)	<0.27(ND) - < 0.54	0.0 – 2.9	0.8816	5.0	NA
Thorium total (pCi/L)	<0.27(ND) - < 0.57	0.1 – 0.65	0.2166	NA	NA
Uranium total (pCi/L)	5.3 -358	6 – 149.85	2.3135	20	NA
Gross Alpha(excluding Radon, Uranium) (pCi/L)	5.4 – 48.6	41.4 – 531	2.6736	15	NA
Gross Beta (pCi/L)	2.7 – 156.6	21.3 – 445	3.5145	NA	NA

[1] Range of concentration values of leached past tailings solids (Modified CAM-WET method) – Molycorp LLC., RWD 2010, Appendix F, Table E2-3 (without regard to amended or unamended tailings material).

[2] Range of concentration values – Molycorp LLC., RWD, 2010 (original data in RWD for Mt Pass Mine and Mill, TRC, 1998)

[3] From fourth quarter 2009 Monitoring Report – mean values from monitoring well 93-1MW

[4] Reporting limit 0.0005 mg/L

[5] California Code of Regulations (CCR), title 22, sections 64431, 64442, 64449, primary and secondary maximum contaminant levels.

[6] California Department Public Health Action Level.

[7] CCR, title 22, section 66261.24, Table II: Soluble threshold limit concentrations. (STLC); for barium excludes barium sulfate.

mg/L = Milligrams per liter
NA = not applicable
NR = Not reported
ND = Not detected at concentrations less than the value shown
pCi/L = Pico curies per liter

7. Description of Waste Management Units (WMUs)

The Discharger proposes to build the lined, Group B Mining Waste Pile (NWTDF) in two stages, which will ultimately cover a footprint of 95 acres as shown in Attachment "C" attached to and made part of this Order. The NWTDF will have the capacity to contain approximately 20-million tons of tailings based on a mill-feed rate of 2,000 tons per day and 30 years of operation. The final elevation of the NWTDF, as proposed, will be 5,000 feet (above mean sea level). The cured paste tailings waste would support low ground pressure dozers to shape the exterior slopes at a ratio of 3 horizontal to 1 vertical (3H:1V) at various times during operations (RWD, Molycorp Minerals LLC, March 2010). The NWTDF will be buttressed against the northern slope of the west overburden stockpile (WOS), with the slope liner constructed as shown on Attachment "D," which is attached to and made part of this Order.

The Discharger proposes to dewater and discharge Group B tailings waste as a paste-like material containing up to 85 percent solids. Pilot testing indicates that dewatered tailings will achieve a high dry strength and behave like a stiff to very stiff soil with a hydraulic conductivity of up to 7.5×10^{-6} centimeters per second (cm/s). The estimated volume of drainage of the tailings pore water from successive paste tailings layers will be minimal to no excess free water produced. Pursuant to CCR, title 27, section 22490, and those sections of CCR, title 27 referenced therein, the NWTDF containment system will be built to contain potential leachate from the tailings solids and precipitation that falls on the NWTDF.

a. The Group B Mining Waste Pile (NWTDF) liner system will be constructed as follows, from bottom to top:

   i. 6-Inch thick layer of graded bedding material (sand),

   ii. 60-Mil (0.06 inches) thick High Density Polyethylene (HDPE) geomembrane,

   iii. 12-Inch-thick drainage layer (pea gravel) embedded with a 4-inch diameter perforated HDPE pipe, and,

   iv. Needle-punched, non-woven geotextile.

   The drainage layer will drain to a small (24-foot-long by 24-foot-wide by 2-foot-deep) collection/flow-through sump located at the southwest corner of the lined area (LCRS sump), which will gravity feed directly to the Reclaim Pond as shown in Attachment "F," which is attached to and made part of this Order. The perimeter of the liner system will be anchored using a 2-foot deep, backfilled trench.

b. Group B Mining Waste Surface Impoundments

i. The proposed Reclaim Pond liner system will be constructed with two, 60-mil thick, geomembrane liners and intervening, high-flow capacity drainage layer (HDPE geonet). It will cover an area of approximately 1.9 acres and will be located at the southwestern foot of the NWTDF. The lower liner will be graded to drain to a minimum 2-feet deep, gravel filled collection sump in the southwestern corner of the NWTDF. The sump will be fitted with a 10-inch-diameter perforated HDPE riser pipe to monitor water levels and collect potential leakage through the upper liner. The Reclaim Pond will collect stormwater run-off from precipitation that falls on the NWTDF, as well as any tailings wastewater that is collected from below the tailings waste pile. Retained wastewater will be allowed to either evaporate or will be pumped to a second, approximately 1-acre, lined Clarification Pond located near the paste tailings plant shown in Attachment "C."

ii. The proposed Clarification Pond liner system consists of a reinforced concrete top liner, underlain by a 1-foot-thick gravel drainage layer underlain by a 60-mil HDPE liner. A 4-inch-diameter perforated HDPE pipe will be installed in the drainage layer and extended to the surface to provide monitoring and removal of any leakage, Attachment "F," which is attached to and made part of this Order. The Clarification Pond will provide storage, settling and clarification of paste plant filtrate, thickener overflow, and sumpage water from the paste plant as well as water pumped from the Reclaim Pond. The clarified water will be returned to the paste plant and mill for reuse or used, as needed, for dust control on the NWTDF. The settled solids will be periodically removed and re-incorporated into the paste tailings process. The proposed concrete top liner does not meet prescriptive standards in CCR, title 27, section 22490. The Discharger has not demonstrated that concrete liner will meet or exceed performance goals pursuant to CCR, title 27, section 22490, subsection (f)(6). The Discharger is required to propose a liner design that will satisfy prescriptive standards for the top liner component of the Clarification Pond.

8. Existing Surface Impoundments

a. Existing inactive product storage ponds store dry lanthanum product from prior mining operations and are shown in Attachment "G," which is made part of this Order. Existing inactive product storage ponds include the following:

i. Filter Cake Storage Ponds P-7A and P-7B: These two contiguous, asphalt-lined ponds contain lanthanum hydrate, cerium, and unleached bastnasite ore.

ii Cerium Product Storage Pond P-25A: This pond is an asphalt-lined pond containing cerium and baghouse dust.

iii. Lanthanum Hydrate Storage Pond P-28: This is a geomembrane-lined pond and formerly used to store lanthanum product slurry; however, currently this pond contains dried lanthanum product.

b. Former product and waste disposal ponds for which closure is complete or anticipated are listed in Attachment "G," which is attached to and made part of this Order. Approval granted by this Order to discharge mining-related impacted soils from the former storage ponds and drainage areas into the NWTDF does not constitute approval of closure of these former ponds or remediation of drainage areas. Determination of final cleanup levels and confirmation that closure is complete for these former ponds and drainage areas will be administered separately from this Order by the Water Board.

c. Stormwater Runoff Collection Ponds P-29 and P-20A: These are active, unlined ponds used to collect stormwater runoff from plant processing areas and are not scheduled for closure.

9. Waste Classification

In accordance with CCR, title 27, section 22480, the waste streams listed in Findings No. 6.b, 6.c, and 6.d, are classified as Group B Mining Waste; section 22480, subsection (b)(2) states:

"... mining waste of Group B are either:
(A) mining wastes that consist of or contain hazardous wastes, that qualify for a variance under Chapter 11 of Division 4.5, of Title 2 of this code, provided that the RWQCB finds that such mining wastes pose a low risk to water quality; or

(B) mining waste that consist of or contain nonhazardous soluble pollutants of concentrations which exceed water quality objectives for, could cause degradation of waters of the state ..."

The wastes are a low risk to water quality provided they are properly disposed/reused in accordance with the WDRs contained herein.

The California Department of Toxic Substance Control (DTSC) regulates hazardous waste under Division 4.5, Title 22, CCR (Division 4.5). Division 4.5 includes threshold criteria and exemptions used in determining if a waste must be regulated

as a hazardous waste. Laboratory analyses indicate the wastes listed in Finding 6 are below the threshold criteria in Division 4.5, with the exception of lead in the tailings solids. The tailings, however, are exempt under an exemption that applies to mining waste generated by beneficiation of ore. Beneficiation of ore is defined to include processing of ore by crushing, grinding, flotation and leaching (CCR, title 22, section 66261.4). As discussed in Findings above, these are the processes carried out at the Discharger's Facility. Moreover, DTSC granted an exemption from the regulation of tailings as hazardous waste under Division 4.5 in a letter dated March 10, 1986. DTSC's position has not changed since that date.

The mine overburden waste rock is classified as Group C mining waste under CCR, title 27, section 22480, subsections (b)(3) and (c).

10. Waste Management Unit Classifications

The proposed and existing waste management units at the mine site are classified in accordance with the following:

a. The proposed Northwest (Paste) Tailings Disposal Facility (NWTDF) is classified as a Group B Mining Waste Pile, pursuant to CCR, title 27, section 22480.

b. The proposed Reclaim and Clarification Ponds are classified as Group B Surface Impoundments, pursuant to CCR, title 27, section 22480.

c. The existing and proposed overburden mine waste rock waste piles are classified as Group C Mining Waste Piles pursuant to CCR, title 27, section 22480.

11. Drainage Modeling of Paste Tailings

The hydraulic behavior of the paste tailings stack was modeled to estimate the amount of water that would be generated from the combined contribution of stormwater infiltration and excess tailings pore water produced during waste tailings solids hardening (RWD, Molycorp Minerals LLC, March 2010).

Based on this modeling, paste tailings field data, and laboratory analytical test results, the net amount of water that would drain through the paste tailings waste pile will range from 0.9 to 1.6 inches per year (under average to wet precipitation years), which is approximately equivalent to a 4- to 8-gpm flow rate for the entire 95-acre waste pile footprint.

12. Paste Tailings Geotechnical Characteristics

Laboratory testing and field pilot tests indicate that the paste tailings will be low plasticity silt, designated as ML under the Unified Soil Classification System, with a

specific gravity of 3.22. The dewatered tailings will contain no free water and field tests indicate that, after consolidation, the dewatered tailings will have a very low hydraulic conductivity. Paste tailings will be discharged to the lined containment via pipeline in thin layers with a period of time between each layer to allow for drying or curing of the paste prior to deposition of additional layers. Field tests show that percent moisture of the tailings declines to minimum levels, achieving high dry strength properties about 21 days after placement. The 30-year life of the facility indicated that an average tailings generation rate of 6 inches per month would be needed to contain the entire volume of tailings generated.

13. Engineered Alternative to Prescriptive Standard

Only those prescriptive standards for discharge of mining waste as provided in CCR, title 27, section 22470 through 22510 (Mining Waste Management Regulations), and such provisions of other sections in CCR, title 27, as specifically referenced in the Mining Waste Management Regulations portion, shall apply. CCR, title 27, section 20080 et seq. (as referenced in CCR, title 27, section 22470, subsection [a]) is applicable for discharge of mining waste and allows for engineered alternatives to prescriptive standards. Alternatives shall only be approved where the Discharger demonstrates that: 1) the construction of prescriptive standard is not feasible because it is unreasonably and unnecessarily burdensome and will cost substantially more than alternatives, which meet the criteria, or is impractical and will not promote attainment of applicable performance standards; and 2) there is a specific engineered alternative that is consistent with the performance goal of the prescriptive standard and affords equivalent protection against water quality impairment.

a. Liner System

The liner designs proposed for the Group B Mining Waste Pile and the Group B Mining Waste Surface Impoundments (see Finding No. 8) is an alternative engineered liner design. In lieu of attaining permeability ($1x10^{-6}$ centimeters per second [cm/s]) standards for natural or constructed liners, as specified in CCR, title 27, section 22490, subsection (c), Table 1.3, the Discharger has demonstrated that the proposed alternative engineered liner design will meet or exceed the Performance Standard required in CCR, title 27, section 22490, subsection (f)(6) for containment of waste. The performance standard for liners shall be designed and constructed to contain the fluid, including waste and leachate, as required by Article 3 of this subchapter (CCR, title 27, section 20240 et seq., and section 20310).

The Discharger has demonstrated that predicted flow through the alternative engineered liner system is calculated to be 2 to 2,000 times less than the prescriptive standard (two feet of soil with a maximum permeability of 1 x

10^{-6} cm/s). The Discharger has shown that there are no local sources of soil material that would meet the permeability requirements for the prescriptive standard. The alternative engineered liner, as proposed, for the Group B Mining Waste Pile and Group B Mining Waste Surface Impoundments will, therefore, afford equivalent protection against water quality impairment.

b. Groundwater Monitoring

The Discharger has proposed an alternative engineered design to the prescriptive standard for groundwater detection monitoring beneath the Clarification Pond. CCR, title 27, section 20420, subsection (b), requires that for WMUs, a detection monitoring program includes monitoring points installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer. The detection monitoring program must provide the best assurance of the earliest possible evidence of a release from a WMU. The Discharger has shown that depth to groundwater beneath the Clarification Pond is greater than 300 feet and within fractured bedrock, which would preclude effective groundwater monitoring for earliest possible detection of a release.

The proposed alternative engineered design consists of a monitoring system (pan lysimeter) constructed beneath the Clarification Pond, and is shown in Attachments "E" and "F." This proposed design meets or exceeds performance criteria as well as or better than the prescriptive standard. The system consists of a pan lysimeter beneath the LCRS sump (low point of drainage for possible leaks from the lower liner) and a 12-foot wide pan lysimeter along the 300 foot longitudinal axis (centerline) beneath the lower liner. The lower liner will be constructed such that liquid above the liner will flow along a longitudinal axis directly above the lysimeter system. The design will provide detection more effectively than groundwater monitoring, given site conditions, and will meet performance standards pursuant to CCR, title 27. The Water Board, therefore, accepts this alternative engineered design for the detection monitoring system for the Clarification Pond.

14. Windblown Monitoring of Tailings Solids

This Order requires the Discharger to conduct monitoring and reporting of windblown transport of tailings solids from the NWTDF (tailings waste pile) and respond to detected solids transport.

15. Authorized Disposal Sites

The only authorized disposal site for the tailings waste solids and tailings leachate (paste tailings) (Group B Mining Wastes), is the NWTDF. The only authorized disposal sites for the tailings wastewater (tailings waste pile leachate and

stormwater runoff from NWTDF) are the Reclaim and Clarification Ponds. The only authorized disposal sites for the mine overburden waste rock (Group C Mining Wastes) are the West Overburden Stockpile and the North Overburden Stockpile. The authorized disposal sites are located on land owned by the Discharger. Wastewater from the Reclaim and Clarification pond is authorized for reuse in the mill or processing plants and as dust control on the NWTDF.

16. Technical and Monitoring Reports

The Discharger must submit technical and monitoring reports in compliance with this Order as described in Monitoring and Reporting Program No. R6V-2010-0047, (MRP), which is attached to, and made part of this Order. The fact that the Discharger is seeking coverage under waste discharge requirements issued by the Water Board for one or more proposed discharges demonstrates that the Discharger is proposing to discharge waste that could affect the quality of waters within the Lahontan region, and supports the requirement that the Discharger submit technical and monitoring reports in compliance with this Order. The burden, including the costs of the required monitoring and reporting bears a reasonable relationship to the need and the benefits to be obtained from the required monitoring and reports.

17. Water Quality Protection Standard

The Water Quality Protection Standard (WQPS) consists of constituents of concern (COCs [including monitoring parameters]), concentration limits (background data sets), Monitoring Points, and the Point of Compliance. The standard applies over the active life of the NWTDF and the Reclaim Pond, closure and post-closure maintenance period, and the compliance period. The constituents of concern, Monitoring Points, and Point of Compliance are described in the MRP. This Order requires the Discharger to propose concentration limits for all constituents of concern, which are subject to Water Board approval. An alternative WQPS will apply to the Clarification Pond. The detection monitoring program for the Clarification Pond to determine evidence of a release will not include groundwater monitoring but will instead require monitoring for liquids in its pan lysimeter system.

18. Statistical Methods

Statistical analyses of monitoring data is necessary for the earliest possible detection of measurably significant evidence of a release of waste from the Facility. CCR, title 27, section 20415, requires statistical data analyses to determine when there is "measurably significant" evidence of a release from the Unit. MRP No. R6V-2010-0047 includes methods for statistical analyses and monitoring parameters. Control charts have been developed using intra-well comparison techniques. Eight quarters of historical data have been used for the wells designated as monitoring points to construct Shewhart-CUSUM control charts for each well and for each

monitoring analyte. Control limits based on statistical analyses are defined for each existing well and are required for proposed compliance wells. Control limits may be updated in accordance with CCR, title 27, section 20415. The monitoring parameters, a subset of the constituents of concern, listed in the MRP are believed to be the best indicators of a release from the Facility. Monitoring of the Clarification Pond will use an alternative method to determine a release has occurred and is described in the MRP.

19. Cleanup and Abatement Orders (CAOs)

Enforcement Orders that are in effect for the Mine Site are as follows:

a. On March 25, 1998, the Executive Officer issued CAO No. 6-98-19 to the Discharger to abate the leakage of waste from the previous tailings and mining-related waste discharges, and implement an acceptable groundwater Corrective Action Program.

b. On March 5, 2001, the Executive Officer amended CAO No. 6-98-19 to allow the Discharger additional time to comply with the requirements of CAO No. 6-98-19, replacing Order Nos. 1 through 10 of CAO 6-98-19 with Order Nos. 1 through 6 of CAO No. 6-98-19A1. CAO No. 6-98-19A1 and Order No. 11 of CAO No. 6-98-19 remain in effect, requiring the Discharger to investigate and abate impacts to soil and groundwater from mining related waste discharges.

20. Detection Monitoring Program

Pursuant to CCR, title 27, section 22500, with reference to section 20385 (requiring the Discharger to institute a detection monitoring program under section 20420), the Discharger has proposed a detection monitoring program (DMP) for the NWTDF and Reclaim and Clarification ponds (allowing for engineered alternative in Finding No 13). The DMP consists of monitoring the leachate collection and removal systems (LCRS), the unsaturated zone for the presence of liquid, and groundwater for the presence of constituents of concern. The DMP is incorporated into MRP No. R6V-2010-0047.

21. Evaluation Monitoring Program

Pursuant to CCR, title 27, section 22500, subsection (a), Group B mining waste units shall comply with monitoring requirements in CCR, title 27, sections 20385 through 20430. This Order requires the Discharger to comply with CCR, title 27, section 20425, and implement an evaluation monitoring program (EMP) if evidence of a release was determined under the detection monitoring program and/or verification procedures.

22. Corrective Action Program

Pursuant to CCR, title 27, section 22500, subsection (a), Group B mining units shall comply with monitoring requirements in CCR, title 27, sections 20385 through 20430. This Order requires the Discharger to comply with CCR, title 27, section 20430, and implement a corrective action program (CAP) to remediate released wastes from the Group B mining waste management units should a release occur.

23. Closure Specifications

CCR, title 27, section 22490, subsection (f)(1), requires that synthetic liners may be used for waste piles only if the Discharger can demonstrate that the liner will function adequately during the active life of the waste pile, and can either demonstrate that clean closure of the waste pile is infeasible, or close the waste pile by removing all waste material and related contaminated components of the unit and discharge to an appropriate waste management unit. The Discharger has certified that the liner construction, through the submitted construction quality assurance plan, will be installed in accordance with CCR, title 27, sections 20323 and 20324, for installation performance standards.

Pursuant to CCR, title 27, section 20080, subsection (1)(a), the Water Board finds that a more stringent requirement than the demonstration of clean-closure feasibility for the Group B Mining Waste Pile is necessary to ensure protection of water quality. This requires that the Group B Mining Waste Pile be closed in place, so that the liner, once built, is maintained and remains intact during post-closure, and that closure and post-closure maintenance is performed pursuant to CCR, title 27, section 21090.

The Discharger has submitted a preliminary closure and post-closure maintenance plan in accordance with CCR, title 27, section 22510, for the NWTDF and the Reclaim and the Clarification Ponds. The Discharger proposes to close the NWTDF in place as a landfill and to clean-close the Reclaim and Clarification Ponds.

Pursuant to CCR, title 27, section 22510, subsection (j), this Order requires that the Group B Mining Waste Pile (NWTDF) be closed in accordance with the provisions of CCR, title 27, section 21090, subsections a through c. For final covers, CCR, title 27, section 21090, subsection (a) states that Water Board can allow any alternative final cover design that it finds will continue to isolate the waste in the waste management unit from precipitation and irrigation waters at least as well as would a final cover built in accordance with applicable prescriptive standards under CCR, title 27, section 21090, subsection (a)(1 through 3).

As an alternative to the standards in CCR, title 27, section 21090, subsection (a)(1 through 3), the Discharger proposes to close the NWTDF using an evapotranspiration final cover, equivalent to that installed on the nearby closed Group B Waste Tailings Pond (P-16). Based on four years of soil cover monitoring data collected from P-16 since data collection began in 2006, this evapotranspiration cover design is performing as designed and exceeds prescriptive standards. The Discharger has demonstrated that the evapotranspiration soil cover is feasible and meets performance standards pursuant to CCR, title 27, section 20950.

Based on these factors, the Water Board hereby approves the use of the proposed evapotranspiration final cover for the NWTDF.

24. Geology

As described in the RWD (March 2010), the surface geology of the Mine Site is characterized by partially lithified older alluvium and outcropping bedrock in the west and south, and by Precambrian gneiss, low terrace gravels, and recent alluvial deposits in the wash areas in the north and east. Surface deposits in the washes consist of moderately-to well-sorted pebbles and cobbles within a fine- to medium-grained sand matrix, and range from a few feet to 20 or 30 feet in thickness.

The older partially lithified alluvium deposits (Quaternary to possibly Tertiary age) predominate the natural overburden of the Mountain Pass area and are also referred to as "older gravels" and debris flows. They are comprised of poorly sorted pebble- to boulder-sized clasts in a finer-grained matrix. These deposits extend to significant depths (i.e., on the order of hundreds of feet) and represent debris flows that have filled deep channels in the bedrock. These deposits are often firmly cemented with calcareous mud, particularly in the western portion of the site where carbonate rocks predominate.

Bedrock at the site consists of Precambrian metamorphic and intrusive rocks, consisting primarily of granitic and mafic gneiss. The main igneous bodies at the Mine Site, which have intruded the older metamorphic complex, consist of shonkinite syenite stocks and associated carbonatites. The dominant structural fabric is represented by faulting, foliation, jointing, and dikes, trends to the northwest, and dips steeply to the northeast or southwest.

The northeastern portion of the proposed NWTDF will overlie bedrock and a relatively thin (up to 10-feet-thick maximum) layer of recent alluvium, based on geologic mapping and nearby drilling data. Southwest of the NWTDF, based on wells drilled nearby, older debris flow material is interpreted to extend into this area, increasing in thicknesses above the bedrock contact.

25. Mineralogy

The ore body and surrounding geologic formations contain elevated concentrations of a number of naturally occurring minerals. These minerals include the following: bastnasite (mixed lanthanide fluoride carbonate), calcite ($CaCO_3$), strontianite ($SrCO_3$), barite ($BaSO_4$), celestite ($SrSO_4$), silica (Si), galena (PbS), cerrusite ($PbCO_3$), hematite (Fe_2O_3), and monazite (mixed lanthanide thorium phosphate). The natural radioactivity of the ore and tailings solids is primarily due to the radionuclides of the thorium-234 and uranium-238 decay series. Bastnasite is the primary rare earth mineral in the ore body. The rare earth content of bastnasite is about 49 percent cerium, 33 percent lanthanum,12 percent neodymium and 4 percent praseodymium, with the remaining 2 percent made up of the other rare earth elements.

26. Site Hydrogeology

As described in the RWD (March, 2010), groundwater flows southward in the Mine Site area, and then both east and west in the drainages along the southern edge of the Mine Site, generally paralleling surface water flows. The groundwater ultimately drains eastward into the Ivanpah Valley or westward into Shadow Valley.

Depth to groundwater varies from 100 to 200 feet (or more) in the northern and western portion of the Mine Site and from 10 feet or less in the southeastern portion, generally being shallowest in the major drainages and deepest below topographic ridges. Depth to groundwater beneath the proposed NWTDF is about 150 feet below ground surface (bgs). After cessation of mining, groundwater is anticipated to rise, but is projected to stabilize at depths no shallower than 70 feet bgs. In the southeast portion of the Mine Site, southeast of the WMUs, there are several springs, mostly ephemeral but some perennial that have been observed where bedrock is present near the surface. Water quality in some of these springs has been impacted by mining operations.

The groundwater depth and groundwater migration patterns at the Mine Site are influenced by corrective action pumping and pit dewatering activities. These activities have created local "cones of depression" in the groundwater potentiometric surface. Groundwater occurs in fractured bedrock below the proposed waste pile and impoundments and flows southeasterly, towards the mine pit cone of depression.

Mine Site aquifer hydraulic conductivity values and related groundwater migration rates exhibit considerable variability, depending both on lithology and the degree of fracturing or other secondary permeability development. The recent surface wash deposits are the most permeable at the site, exhibiting hydraulic conductivity values on the order of 1×10^{-2} cm/sec. The older alluvium deposits have been found to be significantly less permeable than the recent alluvium, exhibiting hydraulic

conductivity values on the order of 1 x 10^{-5} to 1 x 10^{-7} cm/sec. Permeability within the bedrock is fracture controlled. Hydraulic conductivity values in fractured zones range up to 6 x 10^{-3} cm/sec, while those in less fractured zones are estimated to range from up to 1.5 x 10^{-5} cm/sec. Unfractured bedrock is considered essentially impermeable and likely acts as a groundwater flow barrier in many locations.

Calculated groundwater migration rates, based on the hydraulic conductivity data and current gradients, are about 8 feet per day (ft/day) in the shallow alluvium, are in the 1 to 4 ft/day range for moderately fractured bedrock, and are less than 1 ft/day for slightly fractured bedrock and older alluvium/debris flow deposits. Groundwater migration rates of up to 45 ft/day are calculated for the area between P-16 and the mine pit, where the rock is highly fractured and the steepest hydraulic gradient occurs.

27. Site Topography, Surface Drainage and Flood Hazards

The Mine Site is situated at an elevation of approximately 4,700 feet above mean sea level (amsl) in a topographic pass between the Clark Mountains to the north and the Mescal Mountain Range and Mineral Mountain Range to the south. The pass forms a surface water and groundwater divide between the Upper Kingston Valley (groundwater) Basin to the west and the Ivanpah Valley (groundwater) Basin to the east. Site topography is shown on the Location Map in Attachment "A."

The surface topography slopes to the southeast, and surface run-off from the site is channeled along southeastward sloping washes. Surface water run-off ultimately flows either westward to Shadow Valley (Amargosa Hydrologic Unit) and the Upper Kingston Basin via the western drainage, or eastward towards the Ivanpah Valley Basin via Wheaton Wash. The proposed NWTDF and Reclaim Pond are within the western surface drainage that drains southwest into Shadow Valley. The Clarification Pond is within eastern drainage (Ivanpah Hydrologic Unit). Surface runoff in the area is primarily by sheet flow within localized drainage courses.

The Mine Site is not located in a floodplain. The 100-year, 24-hour design storm is approximately 3.8 inches of precipitation.

28. Seismic Hazards

The Mine Site area is not within an active earthquake fault zone, as defined by the Alquist-Priolo statute. The Pahrump-Stateline fault, which is potentially active and located about 11 miles east of the mine, is the controlling fault for calculating the Maximum Credible Earthquake for the Waste Management Units. The MCE on this fault has been calculated as a Richter scale magnitude 7.5. A peak acceleration of 0.32g has been calculated for the Mine Site based on this theoretical event.

In 2002, the Discharger provided a post-closure, slope stability assessment for the mine pit, the West Overburden Stockpile, the North Overburden Stockpile, and the NWTDF under static and pseudostatic (dynamic) conditions (EIR, 2004). The minimum static factor of safety (FOS) for all slopes computed ranged from 1.8 to 2.3. The minimum dynamic FOS for those same slopes ranged from 1.1 to 1.8. The slope with the lowest FOS included the west slope of the NWTDF. All calculations used estimated material strength parameters where site-specific laboratory test results were not available.

Revised slope stability analyses (Revised Slope Stability and Deformational Analyses, RWD, April 23, 2010), of the NWTDF (using proposed engineered alternative liner design) demonstrate that under dynamic loading, the minimum calculated FOS for the most critical slope (western) of the NWTDF during post closure is 1.00. This analysis used circular and block failures for the most critical slopes of the NWTDF (proposed design), which includes slope ratios of no greater than 3 horizontal to 1 vertical, and a final elevation of 5,008 feet amsl (height of about 200 feet above ground). A FOS of 1.77 was calculated using slope stability analysis for static loading conditions for the western slope using an identical NWTDF design, as above.

Pursuant to CCR, title 27, section 21750, subsection (f)(5)(C), in lieu of achieving a factor of safety of 1.5 under dynamic conditions, the discharger can utilize a more rigorous analytical method that provides a quantified estimate of the magnitude of movement. In this case, the report shall demonstrate that this amount of movement can be accommodated without jeopardizing the integrity of the Unit's foundation or the structures which control leachate, surface drainage, or erosion.

The Discharger has performed deformation analysis on the NWTDF final fill based on seismic loading conditions (dynamic conditions) for the most critical cross-section of the NWTDF (west-facing slope). As modeled, the most critical failure surface for the NWTDF lies at the base of the waste pile along the geomembrane/soil interface. The Discharger calculated that the total displacement that might occur, given the proposed design geometry and assumed material properties of the tailings waste and liner, is 0.05 to 0.39 feet (0.6 to 4.7 inches) The tailings height above the failure surface is approximately 156 feet.

Under seismic conditions, liner deformation of less than 6 inches is generally an acceptable amount for lined landfills in California provided the liner is not compromised. At this time, the Discharger cannot, with certainty, determine if the above calculated deformation, based on the assumed material properties, will compromise the containment system. This Order requires the Discharger to perform additional dynamic stability evaluations on the final configuration of the liner subgrade and use material specific liner interface testing to determine the site specific FOS and/or magnitude of liner deformation.

29. Groundwater Quality

a. Background Water Quality

The source of recharge to the groundwater at the Mine Site derives from the Clark Mountain Range. Groundwater in the three existing monitoring wells west of the proposed tailings waste pile (NWTDF) exhibit total dissolved solids (TDS) concentrations ranging from 400 to 600 mg/L, with low but detectable concentrations of barium, boron, strontium, and radiological constituents. Other groundwater analyses show that ambient groundwater quality at the Mine Site is variable. For example, background monitoring well 93-1MW, located upgradient to the Mine Site, intercepts shallow groundwater that receives rapid recharge during wet years and years with good snow pack. The TDS concentrations in monitoring well 93-1MW average 360 mg/L, with low concentrations of radiological constituents, metals, and other minerals, as specified in Table 1, Findings No. 6 of this Order. Concentrations of constituents in groundwater from monitoring well No. 93-1MW are below water quality objectives (WQOs) for municipal drinking water standards.

b. Polluted Groundwater

Releases of mining waste from onsite facilities (regulated under other Orders) have impacted groundwater within and downgradient of the Mine Site. The two former, closed tailings ponds P-16 and P-1 (regulated under separate Orders) are the primary sources of residual groundwater pollution. Both have been closed in compliance with their respective Water Board Orders. To a lesser contribution, former surface impoundments that stored product slurries and wastewater from the Discharger's mineral processing plants (Flotation Plant, Separations Plant, and Specialty Plant) are historical sources of groundwater pollution. Stormwater detention pond P-20A is also a potential historical source and is under investigation as required by CAO No. 6-98-19. The proposed NWTDF and Reclaim Pond are outside of areas where groundwater is known to be impacted. The Clarification Pond is in an area where groundwater has been impacted and is being monitored.

Downgradient of the proposed NWTDF, water within the mine pit is impacted from former P-16 seepage and is captured by the cone of depression affected by the groundwater sink intersected by the pit area. The pit extraction system captures more than 50 percent of the remnant seepage from P-16 as well as a large portion of the remnant P-1 plume. The capture zone will expand with time as the pit is deepened and dewatering continues.

c. Water Supply

The Discharger owns two separate well fields that have been used to supply domestic water to the unincorporated community of Mountain Pass. One wellfield is 10 miles to the west in the Amargosa Hydrologic Unit (Shadow Valley). The other wellfield is 10 miles to the east in the Ivanpah Hydrologic Unit (Ivanpah Valley). The well fields have been used to supply water to the Mine Site, a former school, and residences. There are no active domestic water supply wells within the Mine Site or within a distance of several miles downgradient of the Mine Site. The Discharger currently supplies domestic water to the Community of Mountain Pass from the wells in the Amargosa Hydrologic Unit (Shadow Valley).

30. Receiving Waters

The receiving waters are groundwater and surface waters (ephemeral springs) of the Ivanpah Hydrologic Unit, and groundwater and surface waters of the Amargosa Hydrologic Unit (Hydrologic Unit Nos. 612.00 and 609.00, respectively, Plate 1B, Lahontan Region (6), South Lahontan Hydrologic Basin Planning Area), Water Quality Control Plan for the Lahontan Region.

31. Lahontan Basin Plan

The Water Board adopted a Water Quality Control Plan for the Lahontan Region (Basin Plan), which became effective on March 31, 1995. This Order implements the Basin Plan.

32. Beneficial Uses - Groundwater and Surface Water

The historic, present and potential beneficial uses of the groundwaters of the Ivanpah Valley (6-30) and Upper Kingston Valley (6-22) Groundwater Basins, as set forth and defined in the Basin Plan, are:

a. Municipal and Domestic Supply (MUN);
b. Agricultural Supply (AGR);
c. Industrial Service Supply (IND); and
d. Freshwater Replenishment (FRSH).

The present and potential beneficial uses of surface waters (including ephemeral springs) of the Ivanpah (612.00) and Amargosa (609.24) Hydrologic Units are set forth and defined in the Basin Plan under Minor Surface Waters and minor wetlands. Those beneficial uses are:

a. Municipal and Domestic Supply (MUN);
b. Agricultural Supply (AGR);
c. Groundwater Recharge (GWR);
d. Freshwater Replenishment (FRSH);
e. Water Contact Recreation (REC-1);
f. Non-contact Water Recreation (REC-2);
g. Warm Freshwater Habitat (WARM);
h. Cold Freshwater Habitat (COLD);
i. Wildlife Habitat (WILD);
j. Water Quality Enhancement (WQE); and
k. Flood Peak Attenuation/Flood Water Storage (FLD).

33. Protection from Storm Events

This Order requires the Discharger to operate the NWTDF, and Reclaim and Clarification Ponds to accommodate the 10-year, 24-hour storm event (design storm) in accordance with CCR, title 27, section 22490, subsection(h)(1)(B). The Discharger has demonstrated that the proposed flood protection structures including stormwater diversion channels to redirect upgradient runoff around the NWTDF and Reclaim and Clarification ponds to nearby natural drainage courses will accommodate the 10-year, 24-hour storm event.

The Discharger submitted water balance calculations that demonstrate the Reclaim Pond system has the capacity to hold precipitation for a 100-year, 24-hour storm event falling over the entire 95-acre tailings waste pile footprint and a portion of the West Overburden Stockpile while maintaining a minimum 2 feet of freeboard. The Discharger has calculated, using runoff modeling software, modeling pond capacity calculations that for a 100-year, 24-hour storm event, runoff volume yields 12.86 acre-feet (20,747 cubic yards [cy]). The Reclaim Pond capacity is 21,827 cy, which will provide 1,080 cy of excess capacity (excluding 2 feet of freeboard).

The 1,080 cy (218,117 gallons) excess capacity in the Reclaim Pond will be used to contain seepage from the leachate collection system sump for the NWTDF. Seepage is defined here as water or leachate that percolates through the tailings waste pile and is collected in the drainage layer beneath the tailings waste. It is predicted to be generated from dewatering and consolidation of the paste tailings overtime and infiltration of rainwater that falls on the waste pile. The Discharger has modeled the volume and rate of potential seepage from the 95-acre NWTDF to range between 4 gallons per minute (gpm) and 8 gpm (5,700 gallons per day [gpd] and 11,000 gpd) under average year climatic conditions and transient/wet years, respectively.

The Discharger has proposed a wastewater management plan that meets or exceeds the requirements for precipitation and drainage controls and capacity

pursuant to CCR, title 27, section 22490. The Discharger will be required to maintain minimum of 2 feet of freeboard for the Reclaim and Clarification Ponds.

34. Climate

The climate in the Mountain Pass area is arid to semi-arid. Daily temperatures frequently rise to 95 to 100 degrees Fahrenheit (° F) during the daytime in summer months, and fall to 10 to 20° F at night in winter months. The estimated mean annual precipitation at the Mine Site is approximately 8 inches, although annual extremes can vary from 3 to 10 inches. The largest storms occur during the summer months.

Estimated annual gross evaporation at the site is 65 inches, and pan evaporation is approximately 115.5 inches per year. The 24-hour, 100-year storm event is approximately 3.8 inches of precipitation.

Wind direction in the region is predominantly from the south through west-southwest. Average wind speeds range from 6 to 13 miles per hour.

35. Land Uses

Land uses in the vicinity of the Mine Site generally include open space public lands managed by the Bureau of Land Management (BLM) and by the National Park Service (NPS). Land uses surrounding the Mine Site include the following:

North:	Open space, NPS land, and BLM-managed public land.
East:	Open space, and BLM-managed public land.
South:	Open space, Interstate 15, NPS land south of Interstate 15, and BLM-managed public land.
West:	Open space, NPS land, and BLM-managed public land.

A former public elementary school is located at Mountain Pass, approximately 2,000 feet south of the mine pit. The school was closed in 2003. A California Department of Transportation (Caltrans) highway maintenance station and California Highway Patrol (CHP) residences are located south of the Mine Site and west of the elementary school on BLM leases. There are also several parcels of privately owned land, some with residences, located in the general area.

36. Action Leakage Rate

The Discharger has requested that the Water Board allow an action leakage rate (ALR) of liquid through the upper liner of the double-lined Reclaim and Clarification Ponds into the leakage collection sumps. The respective ALRs are based on proposed design dimensions and design specifications of the Surface

Impoundments and on a 1992, United States Environmental Protection Agency (U.S. EPA) guidance document, *Action Leakage Rates for Leak Detection Systems, Supplemental Background Document for the Final Double Liners and Leak Detection Systems Rule for Hazardous Waste Landfills, Waste Piles, and Surface Impoundments*. The numerical ALRs are shown in Table 1 in the MRP No. R6V-2010-0047 and are made part of this Order. The MRP includes requirements for monitoring and reporting leakage rates from the LCRS and the type of response actions the Discharger must take if applicable ALRs are exceeded.

37. Financial Assurance

The Discharger is required to obtain and maintain Financial Assurance Instruments (Instruments) to conduct closure activities and post-closure maintenance activities (including corrective action in response to a release during post-closure period) pursuant to CCR, title 27, section 22510, subsection (f) and sections 22207 and 22212.

Prior to discharge of waste to the waste management units, the Discharger is required to provide two Instruments to cover the costs of closure and post-closure maintenance, acceptable to the Water Board's Executive Officer.

This Order requires the Discharger: (a) to obtain Instruments for closure and post-closure activities for the WMUs; (b) to demonstrate in an annual report that the amount of financial assurance is adequate or increase the amount of financial assurance.

38. Other Considerations and Requirements for Discharge

Pursuant to California Water Code, section 13241, the requirements of this Order take into consideration:

a. Past, present, and probable future beneficial uses of water.

This Order identifies existing surface water and groundwater quality and past, present, and probable future beneficial uses of water, as described in finding No. 32. The proposed discharge will not adversely affect present or probable future beneficial uses of water including municipal and domestic supply, agricultural supply, industrial service supply, and freshwater replenishment, because the discharge is only authorized within lined WMUs and detection monitoring is required to ensure discharges do not reach groundwater.

b. Environmental characteristics of the hydrographic unit under consideration including the quality of water available thereto.

Findings No. 26 and 29 describe the environmental characteristics and quality of water available.

c. Water quality conditions that could reasonably be achieved through the coordinated control of all factors that affect water quality in the area.

The requirements of this Order, including lining of the waste management units, are protective of groundwater and surface water quality. The Water Board will use its existing authority, potential enforcement actions, and these waste discharge requirements to ensure protection of water quality from the discharge.

d. Economic considerations.

Water Quality Objectives established in the Basin Plan for the Ivanpah and Amargosa Hydrologic Units do not subject the Discharger to economic disadvantage as compared to other similar discharges in the Region. This Order will require the Discharger to submit proposals compliant with the requirements of CCR, title 27, and is reasonable.

e. The need for developing housing within the region.

The Discharger is not proposing to develop housing within the region.

f. The need to develop and use recycled water.

The Discharger does not propose the use of recycled water from domestic wastewater sources at this Facility as there is no locally available source. However, wastewater collected in the Group B Surface Impoundments will be recycled for use as dust control at the NWTDF and in the mill and processing plants.

39. California Environmental Quality Act (CEQA)

This Facility is subject to the provisions of the California Environmental Quality Act ([CEQA], Public Resources Code, section 21000 et seq.) in accordance with CCR, title 14, section 15378. The County of San Bernardino (County) is the CEQA Lead Agency for this Facility under the CEQA Guidelines. On July 8, 2004, the County certified the Final EIR for Molycorp Inc. Mountain Pass Mine, 30-Year Plan Project, pursuant to provisions of CEQA. The County certified the EIR with a Statement of Overriding Considerations for the Project, with regard to hazards posed to aquatic vertebrae communities as a consequence to significant impacts to groundwater and pit lake water quality. Significant impacts would occur after implementation of the Project, which includes the paste tailings alternative (NWTDF).

The County found that having considered the unavoidable adverse impacts of the paste tailings alternative project, all feasible mitigation has been adopted to reduce or avoid the potentially significant impacts identified in the EIR and that no additional feasible mitigation is available to further reduce significant impacts. Further, the County found that economic, social and other considerations of the paste tailings alternative project outweigh the unavoidable adverse impacts described below. In making this finding, the County balanced the benefits of the paste tailings alternative project against its unavoidable environmental impacts and has indicated its willingness to accept those effects.

As described in the EIR, the Project (including this Facility), includes 30 years of continued mining for the recovery of lanthanide elements, realignment of the Southern California Edison towers, and construction of additional waste containment facilities to accommodate discharge of tailings waste. Three alternatives to the proposed project were evaluated in the EIR, which included operation of a paste tailings plant and discharge of mining waste in the form of paste tailings to a waste pile disposal facility (NWTDF). The Discharger has proposed in the RWD to operate the mine and discharge mining waste under the paste tailings alternative (NWTDF).

California Code of Regulations, title 14, section 15096, subdivision (g)(2) states: "When an EIR has been prepared for a project, the Responsible Agency shall not approve the project as proposed if the agency finds any feasible alternative or feasible mitigation measures within its powers that would substantially lessen or avoid any significant effect the project would have on the environment."

California Code of Regulations, title 14, section 15096, subdivision (h) states: "The Responsible Agency shall make the findings required by Section 15091 for each significant effect of the project and shall make the findings in Section 15093 if necessary."

The Water Board, acting as a CEQA Responsible Agency in compliance with CCR, title 14, section 15096, subdivision (g)(2), evaluated the potentially significant impacts to water quality identified in the EIR. The Water Board's CEQA mitigation findings are as follows:

a. Significant Impact to Surface Water Quality – Implementation of the Project (paste tailings alternative), will result in significant impacts to groundwater and surface water quality due to the formation of a pit lake. The Draft EIR analyzed potential impacts from the Project, as proposed, which would include the formation of a pit lake after the termination of mining operations and a risk was identified to wildlife from exposure to the poor quality of water that would develop over time in the pit lake. In the Final EIR, additional mitigation for this impact was analyzed extensively with the conclusion that mitigation in the form of an evaporative barrier option would be feasible. The

analysis of this mitigation indicates that water quality in the pit lake is expected to be of better quality in the event that an evaporative barrier is placed over the pit lake. The technical analysis indicates that concentrations of all constituents of concern in the pit lake with the evaporative barrier in place would be within the low range of concentrations of constituents of concern analyzed in the background groundwater wells identified in the Mountain Pass Mine area. The evaporative barrier also provides an effective means to prevent wildlife, including birds, from coming into contact with the water at the pit lake in addition to reducing the loss of water from the pit lake through evaporation. The savings from evaporative losses results in improved water quality, as the concentration of constituents of concern is not expected to increase as water evaporates out of the top of the pit lake under the proposed action. Although the technical data presented to date indicate an evaporative barrier would be effective, and an evaporative barrier is the required mitigation, the proposed evaporative barrier is relatively new technology, and, therefore, the mitigation proposed in Mitigation Measure W-2 (Final EIR) includes post-approval analyses, including water quality monitoring during the filling of the pit lake, further analyses of backfilling of the pit, onsite testing of the evaporative barrier, and future analyses of other technically feasible mitigation for pit lake water quality. Despite imposition of mitigation measures intended to reduce surface water impacts, those impacts will remain significant and unavoidable.

As a Responsible Agency, the Water Board, pursuant to the California Code of Regulations, title 14, section 15093, subdivision (a)(3), considered these potentially unavoidable adverse environmental effects: The adverse effects are "acceptable" because of the economic, legal, social, technological or other benefits of the project. In addition, the mining industry's contribution to the local economy in San Bernardino County is substantial, employing over 2,500 people with an annual payroll approaching $100 million dollars. Today, Molycorp employs 110 people at Mountain Pass and expects to increase the number of employees to 250-400 direct employees during its 30-year plan, as well as 700 to 900 employees during the construction phases. Capital expenditures total approximately half a billion dollars. Therefore, continued mining at Mountain Pass is an important contributor to the County's economy.

The lanthanide minerals are used in a variety of applications including lasers, catalytic converters, computer disk drivers, compact fluoresecent bulbs, nickel-metal hydride batteries, wind turbines, hybrid electric motors, and medical devices. The Mountain Pass mine is currently the only commercial source of rare earth elements in the United States; ninety-seven percent of the rare earth elements are currently supplied by China, which in 2010 has dramatically reduced the available product for export, as the

demand for these elements has continued to increase in the U.S. and worldwide.

These benefits include continued access to the rare earth ore body, which is a unique geological resource and the only commercial rare earth source in the United States. The Water Board finds that the biological and ecological, social, and other benefits of the project outweighs the significant and unavoidable adverse impacts of the project and is therefore "acceptable," pursuant to California Code of Regulations, title 14, section 15093, and consistent with the County's statement of overriding considerations.

b. Potentially significant impact – The Project could cause significant impacts to groundwater or surface water quality from the waste discharge and major changes to surface water flow in drainages due to the diversion of stormwater around mine facilities. The County found in the EIR that potential impacts to hydrology, groundwater, and surface water quality from the paste tailings discharge alternative was considered to be insignificant. The Project, as proposed, included construction of lined containment facilities and groundwater quality monitoring.

The Water Board has reviewed the EIR and finds the mitigation measures, and the monitoring of the effectiveness of the mitigation measures, as specified in this Order, for the discharge of Group B Mining Waste (Paste Tailings Alternative Project), are adequate to reduce water quality impacts to less than significant. This Order requires the Discharger to construct lined containment systems with leak detection and collection systems that are designed to prevent leakage of mining waste to groundwater and surface water.

40. Notification of Interested Parties

The Water Board has notified the Discharger and all known interested agencies and persons of its intent to adopt WDRs for the project.

41. Consideration of Public Comments

The Water Board, in a public meeting, heard and considered all comments pertaining to the NWTDF, Reclaim Pond, and Clarification Pond.

IT IS HEREBY ORDERED that the Discharger shall comply with the following:

I. DISCHARGE SPECIFICATIONS

A. Nondegradation

State Water Board Resolution No. 68-16 "Statement of Policy With Respect to Maintaining High Quality of Waters In California," known as the Nondegradation Policy, requires maintenance of existing high quality in surface waters, groundwaters, or wetlands. Whenever the existing quality of water is better than the quality of water established in the Basin Plan, such existing quality shall be maintained, unless appropriate findings are made under Resolution No. 68-16. The project, as proposed, will not purposefully discharge any waste that will degrade water quality.

B. Receiving Water Limitations

Receiving water limitations are narrative and numerical water quality objectives contained in the Water Quality Control Plan for the Lahontan Region (Basin Plan) for all surface waters and groundwaters of the Lahontan Region. As such, they are required to be met.

1. Surface Water Limitations

The discharge of waste to surface waters shall not cause, or contribute to, a violation of the following water quality objectives for waters of the Ivanpah and Amargosa Hydrologic Units.

a. Ammonia

Ammonia concentrations shall not exceed the values listed in Tables 3-1 to 3-4 of the Basin Plan for the corresponding conditions in these tables. Tables 3-1 to 3-4 of the Basin Plan are incorporated into these requirements by reference.

b. Bacteria, Coliform

i. Waters shall not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes.

ii. The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 milliliter (ml), nor shall more than 10 percent of all samples collected during any 30-day period exceed 40/100 ml. The log mean shall ideally be based on a

minimum of not less than five samples collected as evenly spaced as practicable during any 30-day period. However, a log mean concentration exceeding 20/100 ml or one sample exceeding 40/100 ml, for any 30-day period shall indicate violation of this objective even if fewer than five samples were collected.

c. Biostimulatory Substances

Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect the water for beneficial uses.

d. Chemical Constituents

i. Waters designated as MUN (a beneficial use of surface water of the Ivanpah and Amargosa Hydrologic Units) shall not contain concentrations of chemical constituents in excess of the maximum contaminant level (MCL) or secondary MCL based upon drinking water standards specified in provisions of the California Code of Regulations, Title 22, Division 4, Chapter 15, hereby incorporated by reference into these requirements. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

ii. Waters shall not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses.

e. Chlorine, Total Residual

For the protection of aquatic life, total chlorine residual shall not exceed either a median value of 0.002 milligrams per liter (mg/L) or a maximum value of 0.003 mg/L. Median values shall be based on daily measurements taken within any six-month period.

f. Color

Waters shall be free of coloration that causes nuisance or adversely affects the water for beneficial uses.

g. Dissolved Oxygen

The dissolved oxygen concentration as percent saturation shall not be depressed by more than 10 percent, nor shall the minimum dissolved oxygen concentration be less than 80 percent of saturation.

h. Floating Materials

i Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect the water for beneficial uses.

ii. The concentrations of floating material shall not be altered to the extent that such alterations are discernible at the 10 percent significance level.

i. Oil and Grease

Waters shall not contain oils, greases, waxes or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect the water for beneficial uses.

j. Pesticides

i. For the purposes of these requirements, pesticides are defined to include insecticides, herbicides, rodenticides, fungicides, pesticides and all other economic poisons. An economic poison is any substance intended to prevent, repel, destroy, or mitigate the damage from insects, rodents, predatory animals, bacteria, fungi, or weeds capable of infesting or harming vegetation, humans, or animals (California Agriculture Code 12753).

ii. Pesticide concentrations, individually or collectively, shall not exceed the lowest detectable levels, using the most recent detection procedures available. There shall not be an increase in pesticide concentrations found in bottom sediments. There shall be no detectable increase in bioaccumulation of pesticides in aquatic life.

iii. Waters designated as MUN shall not contain concentrations of pesticides or herbicides in excess of the limiting concentrations set forth in the California Code of Regulations, Title 22, Division 4, Chapter 15. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

k. pH

i. In fresh waters with designated beneficial use of WARM, changes in normal ambient pH levels shall not exceed 0.5 pH

units. For all other water in the Region, the pH must not be depressed below 6.5 or raised above 8.5.

ii. The Water Board recognizes that some waters of the Region may have natural pH levels outside of the 6.5 to 8.5 range. Compliance with the pH objective for these waters will be determined on a case-by-case basis.

l. Radioactivity

i. Radionuclides shall not be present in concentrations, which are deleterious to human, plant, animal, or aquatic life nor which result in the accumulation of radionuclides in the food web to an extent, which presents a hazard to human, plant, animal, or aquatic life.

ii. Waters designated as MUN shall not contain concentrations of radionuclides in excess of the limits specified by the more restrictive of the California Code of Regulations, title 22, division 4, article 5, sections 64441 et seq. This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

m. Sediment

The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect the water for beneficial uses.

n. Settleable Materials

Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or that adversely affects the water for beneficial uses. The concentration of settleable materials shall not be raised by more than 0.1 milliliter per liter.

o. Suspended Materials

i. Waters shall not contain suspended materials in concentrations that cause nuisance or that adversely affect the water for beneficial uses.

ii. The concentration of total suspended materials shall not be altered to the extent that such alterations are discernible at the 10 percent significance level.

p. Taste and Odors

Waters shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish or other edible products of aquatic origin, that cause nuisance, or that adversely affect the water for beneficial uses. The taste and odor shall not be altered.

q. Temperature

i. The natural receiving water temperature of all waters shall not be altered unless it can be demonstrated to the satisfaction of the Water Board that such an alteration in temperature does not adversely affect the water for beneficial uses.

ii. For waters designated WARM, water temperature shall not be altered by more than 5 degrees Fahrenheit above or below the natural temperature.

r. Toxicity

i. All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

ii. The survival of aquatic life in surface waters subjected to a waste discharge, or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge, or when necessary, for other control water that is consistent with the requirements for "experimental water" as defined in the most recent edition of *Standard Methods for the Examination of Water and Wastewater* (American Public Health Association, et al.).

s. Turbidity

Waters shall be free of changes in turbidity that cause nuisance or adversely affect the water for beneficial uses. Increases in turbidity shall not exceed natural levels by more than 10 percent.

2. Groundwater Receiving Water Limitations

The discharge of waste to groundwaters shall not cause, or contribute to, a violation of the following water quality objectives for waters of the Ivanpah Valley and Upper Kingston Valley Groundwater Basins.

a. Coliform Bacteria

In groundwaters, the median concentration of coliform organisms over any seven-day period must be less than 1.1/100 milliliters.

b. Chemical Constituents

i. Groundwaters must not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) or secondary maximum contaminant levels (SMCLs) based upon drinking water standards specified in the provisions of Title 22, Division 4, Chapter 15 of the California Code of Regulations.

ii. Waters must not contain concentration of chemical constituents in amounts that adversely affect the water for beneficial uses (i.e., agricultural purposes).

iii. Groundwaters must not contain concentrations of chemical constituents that adversely affect the water for beneficial uses.

c. Radioactivity

Groundwaters must not contain concentrations of radionuclides in excess of limits specified by the more restrictive of the California Code of Regulations, Title 22, Division 4, Article 5.

d. Taste and Odor

Groundwaters must not contain taste - or odor-producing substances in concentrations that cause nuisance or that adversely affect beneficial uses. For groundwaters, at a minimum, concentrations must not exceed adopted secondary maximum contaminant levels specified in CCR, title 22, Division 4, Chapter 15.

C. Discharge Limitations

1. Solids discharged to the Waste Pile shall not contain free liquids.

Free liquids, as defined in CCR, title 27, means liquid which readily separates from the solid portions of waste under ambient temperature and pressure. Free liquids are not present when a 100 milliliter representative sample of the waste can be completely retained in a standard 400 micron conical paint filter for 5 minutes without loss of any portion of the waste from the bottom of the filter (or an equivalent test approved by the CDTSC).

2. All solids or salts within the Reclaim or Clarification Ponds shall not equal or exceed concentrations of constituents listed in Table 2 in this Order.

3. All wastewater discharged to the NWTDF, Reclaim and Clarification Ponds or the lined channel to the Reclaim Pond shall not contain constituents in levels that equal or exceed concentrations of constituents listed in Table 3 of this Order. Constituents listed in Table 3 are included in CCR, title 22, section 66261.24. All extractants obtained from settled solids or salt samples collected from within the Reclaim or Clarification Ponds shall not contain concentrations of parameters that either equal or exceed the limits listed in Table 3, below.

Table 2. Discharge Limits for Tailings Waste Solids (CCR, title 22, section 66261.24) Inorganic Toxic Substances Total Threshold Limit Concentrations (TTLCs)

Parameter	Units	Maximum Concentration
Antimony (Sb)	mg/kg	500
Arsenic (As)	mg/kg	500
Beryllium (Be)	mg/kg	75
Cadmium (Cd)	mg/kg	100
Chromium (Cr)	mg/kg	500
Cobalt (Co)	mg/kg	8000
Copper (Cu)	mg/kg	2,500
Fluoride (F)	mg/kg	18,000
Mercury (Hg)	mg/kg	20
Molybdenum (Mo)	mg/kg	3,500
Nickel (Ni)	mg/kg	2,000
Selenium (Se)	mg/kg	100
Silver (Ag)	mg/kg	500
Thallium (Tl)	mg/kg	700
Vanadium (V)	mg/kg	2,400
Zinc (Zn)	mg/kg	5,000

Table 3. Discharge Limits for Wastewater/Limits of Wastewater Within the Surface Impoundments (CCR, title 22, section 66261.24) Inorganic toxic Substances Soluble Threshold Limit Concentration (STLC)

Parameter	Units	Maximum Concentration
Antimony (Sb)	mg/L	15
Arsenic (As)	mg/L	5
Beryllium (Be)	mg/L	0.75
Cadmium (Cd)	mg/L	1
Chromium (Cr)	mg/L	5
Cobalt (Co)	mg/L	80
Copper (Cu)	mg/L	25

Table 3. Discharge Limits for Wastewater/Limits of Wastewater Within the Surface Impoundments (CCR, title 22, section 66261.24) Inorganic toxic Substances Soluble Threshold Limit Concentration (STLC)		
Parameter	**Units**	**Maximum Concentration**
Fluoride (F)	mg/L	180
Lead (Pb)	mg/L	5.0
Mercury (Hg)	mg/L	0.2
Molybdenum (Mo)	mg/L	350
Nickel (Ni)	mg/L	20
Selenium (Se)	mg/L	1
Silver (Ag)	mg/L	5
Thallium (Tl)	mg/L	7
Vanadium (V)	mg/L	24
Zinc (Zn)	mg/L	250

II. PROHIBITIONS

A. General

1. The discharge of hazardous waste, as defined in CCR, title 27, section 20164, for treatment, storage, or disposal, to the authorized disposal sites or the generation of hazardous waste due to evaporation in the Surface Impoundments is prohibited.

2. The discharge of hazardous constituents, as defined in CCR, title 27, section 20164, for treatment, storage, or disposal, to the authorized disposal sites that cause the waste to be identified as a hazardous waste is prohibited.

3. The discharge of wastes that fall under the restrictions of CCR, title 27, section 66268.1 et seq. for treatment, storage, or disposal, to the authorized disposal sites is prohibited.

4. The discharge of any type of nonhazardous waste to the authorized disposal sites, including garbage, paper, wood, scrap metal, abandoned equipment, and construction materials, without prior approval by the Water Board, is prohibited.

5. The Discharger shall not cause a release from the authorized disposal sites, as indicated by the appropriate statistical or non-statistical data analyses and verification procedures of the MRP. A release is defined as waste materials detected outside the waste management unit.

6. The discharge of waste except to the authorized disposal sites is prohibited.

7. Discharge, bypass, or diversion of waste from the collection, transport, treatment or disposal facilities to adjacent land areas or surface waters is prohibited.

8. Diversion of peak stream flow run-off around the WMUs that causes accelerated streambank erosion, or that increases sediment in surface water, is prohibited.

III. REQUIREMENTS

A. General

1. The discharge shall not cause a pollution, or threatened pollution, as defined in the California Water Code (CWC), section 13050.

2. Neither the treatment nor the discharge shall cause a nuisance as defined in CWC, section 13050.

3. The Discharger shall remove and relocate to an authorized disposal site any wastes which are discharged in violation of this Order.

4. All closure plans, groundwater monitoring plans, and unsaturated zone monitoring plans requested by this Order shall be prepared by, or under the supervision of, a California professional engineer or certified engineering geologist.

5. The WMUs shall be closed in compliance with the final closure plans approved by the Water Board.

6. The WMUs and associated facilities used for the collection, conveyance, or disposal of Group B and Group C Mining Wastes must be adequately protected against overflow, washout, inundation, structural damage, or a significant reduction in efficiency resulting from a storm with anticipated volume of precipitation and peak flows from a 10-year, 24-hour storm.

7. The WMUs shall be designed and constructed to prevent migration of wastes from the Units to adjacent geologic materials, groundwater, or surface water, during disposal operations, closure, and the post-closure maintenance period.

8. Surface and subsurface drainage from outside of the WMUs must be diverted from the WMUs.

9. All containment structures shall be designed and constructed under the direct supervision of a California professional engineer or a certified engineering geologist and shall be certified by that individual as meeting the prescriptive standards, or an imposed or approved alternative thereto, and performance goals of CCR, title 27 prior to waste discharge.

B. Group B Mining Waste Surface Impoundments

1. Direct pipeline discharge to the WMUs must either be equipped with devices, or must have fail-safe operating procedures, to prevent over-filling. Discharges must be stopped immediately in the event of any containment system failure and the system repaired.

2. The Reclaim Pond shall have sufficient storage capacity to accommodate leachate from the NWTDF, precipitation into the pond, and rainfall runoff from the NWTDF during the design seasonal precipitation.

3. The freeboard for the Reclaim and Clarification Ponds and the lined reclaim channel shall be maintained at no less than 2.0 feet.

4. The Clarification Pond shall have installed an upper liner that meets prescriptive standards for permeability (no greater than $1x10^{-6}$ cm/sec), or demonstrate an alternative engineered design that meets performance standards pursuant to CCR, title 27, 20310 for Water Board approval.

C. Group B Mining Waste Pile (NWTDF)

1. The final slopes for the NWTDF shall be no steeper than 3H:1V, and its final elevation shall be no higher than 5,008 feet (above mean sea level).

2. The Group B Mining Waste Pile must be protected from peak stream flow resulting from a 100-year storm.

D. Product Storage Ponds

1. All Surface Impoundments described in Finding No. 8 shall prevent the migration of wastes to adjacent geologic materials, the unsaturated zone, or groundwater during use, disposal operations,

closure, or the post-closure maintenance period, as applicable. All Surface Impoundments shall prevent the migration of wastes to surface waters.

2. Product Storage Ponds must be clean closed in accordance with a closure plan approved by the Water Board.

E. Stormwater Discharges

Waste in discharges of stormwater must be reduced or prevented to achieve the best practicable treatment level using controls, structures, and management practices. The Discharger shall comply with all requirements (with the exception of purely administrative requirements, e.g., filing a Notice of Intent) contained in the State Water Board's Waste Discharge Requirements For Discharges of Storm Water Discharges Associated With Construction Activity, General Permit No. CAS00002 and/or Waste Discharge Requirements For Discharges of Storm Water Associated With Industrial Activities, General Permit No. CAS00001, and all subsequent revisions and amendments as applicable.

F. Mining Reclamation Plan

The Discharger shall fully comply with the water quality related aspects of the reclamation plan approved by the lead agency (San Bernardino County) as required by CCR, title 27, section 22510 subdivision (c) that incorporates the provisions of the Surface Mining and Reclamation Act, Public Resources Code, Section 2770, et seq.

G. Leachate Collection and Removal System (LCRS)

1. The flow rate through the LCRS sumps shall be maintained to minimize the buildup of leachate head on underlying liners.

2. The LCRS shall be operated to function without clogging throughout the life of the project including closure and post-closure maintenance periods.

3. The depth of leachate in the leachate collection sump shall be kept at the minimum needed to ensure efficient sump dewatering pump operations.

4. The LCRS shall be tested at least once annually to demonstrate proper operation.

5. Leachate generation by the WMUs LCRS shall not exceed 85 percent of the design capacity of the sump pump. Each LCRS shall be designed such that the rate of leachate removal from the LCRS sump will be twice the maximum anticipated daily volume of leachate produced from the unit.

6. The Discharger must report leakage rates of the LCRS in the Reclaim and Clarification Surface Impoundments as specified in *Table 2 ACTION/RESPONSE LEVELS – LCRS FOR SURFACE IMPOUNDMENTS* in the MRP No. R6V-2010-0047. If the leakage rate to an LCRS sump in the Reclaim Pond or the Clarification Pond exceeds the applicable action leakage rate, the Discharger shall comply with the notice of evidence of response to exceeding the action leakage rate requirements in the MRP No. R6V-2010-0047.

H. WATER QUALITY MONITORING AND RESPONSE PROGRAMS

1. Water Quality Protection Standard

a. The Discharger shall propose to the Water Board any constituents of concern not included in the RWD and proposed for discharge to the WMUs least 140 days before discharge of any new constituents of concern. Before a new discharge commences, the Discharger shall estimate the concentration for such constituents within the wastewater stream and submit written statistical method(s) in order to detect a release of such constituents.

b. At any given time, the concentration limit for each constituent of concern must be equal to the background value of that constituent.

c. If the Discharger or Water Board Executive Officer determines that concentration limits were or are exceeded, the Discharger may immediately institute verification procedures upon such determination as specified below or submit an amended Report of Waste Discharge (RWD) within 90 days of such determination in order to establish an Evaluation Monitoring Program.

In the event of a release, unless the amended RWD (proposing EMP) proposed and substantiates a longer period, the Discharger will only have 90 days, once the Water Board authorizes the initiation of the EMP, to complete the delineation, develop a suite of proposed corrective action measures and submit a proposed corrective action program (CAP) for adoption by the Water Board.

2. Statistical Methods

a. The Discharger shall use approved statistical data analysis methods to evaluate Point of Compliance data in order to determine "measurably significant" (as defined in CCR, title 27, section 20164) evidence of a release from the NWTDF or the Reclaim Pond. Approved methods may include an intrawell statistical approach proposed by the Discharger.

b. Allowable statistical methods include: Parametric Upper Prediction Limits, Control Charts, or other data analysis methods, applied in accordance with the U. S. Environmental Protection Agency's (USEPA) Unified Guidance [2009] document, or the parametric Gamma 95% Upper Prediction Limit method, and that have been approved by the Water Board.

c. The Discharger shall determine, within 60 days after completion of the sampling, whether there is measurably significant evidence of a release from the NWTDF, or Reclaim Pond, at each Monitoring Point. The analysis shall consider all constituents of concern that are subject to being tested during that Reporting Period. The Water Board Executive Officer may make an independent finding that there is measurably significant evidence of a release or physical evidence of a release.

3. Physical Evidence of a Release

The Discharger shall determine whether there is significant physical evidence of a release from the WMUs. Significant physical evidence may include, but is not limited to, unexplained volumetric changes in the Surface Impoundments, unexplained stress in biological communities, unexplained changes in soil characteristics, visible signs of leachate migration, and unexplained water table mounding beneath or adjacent to the WMUs, or any other change in the environment that could reasonably be expected to be the result of a release from the Facility.

IV. PROVISIONS

A. Rescission of Board Orders

Board Order No. 6-91-836 is hereby rescinded.

B. Standard Provisions

The Discharger shall comply with the "Standard Provisions for Waste Discharge Requirements," dated September 1, 1994, in Attachment "I," which is made part of this Order.

C. Monitoring and Reporting

1. Pursuant to the California Water Code, section 13267(b), the Discharger shall comply with the attached MRP, which is made part of this Board Order.

2. The Discharger shall comply with the "General Provisions for Monitoring and Reporting," dated September 1, 1994, which is attached and made part of the Monitoring and Reporting Program.

3. Pursuant to CWC, section 13260, the Discharger shall file a complete revised report of waste discharge to the Water Board prior to the discharge of waste to areas outside the authorized disposal site.

4. The Discharger shall maintain a Detection Monitoring Program as required in CCR, title 27, section 20385 subdivision (a)(1).

5. The Discharger shall establish an Evaluation Monitoring Program whenever there is measurably significant evidence of a release, or physical evidence of a release from the Facility, as required in CCR, title 27, section 20385 subdivision (a)(2) or (3).

6. The Discharger shall institute a Corrective Action Program when required pursuant to CCR, title 27, section 20385 subdivision (a)(4).

7. Compliance Period

   a. Release

      Each time the concentration limits are exceeded (i.e., a release above the concentration limit is discovered), a Compliance Period for the affected WMU shall begin on the date the Water Board directs the Discharger to begin an Evaluation Monitoring Program.

b. Automatic Extension

The Discharger shall implement its Corrective Action Program in a timely manner. Pursuant to CCR, title 27, section 20410, if the Discharger's Corrective Action Program has not achieved compliance by the scheduled end of the Compliance Period, the Compliance Period shall be automatically extended until the affected WMU has been in continuous compliance for a least three consecutive years.

D. Closure and Post-Closure Maintenance Plan

The CPCMP shall be updated if there is a substantial change in operations. A final CPCMP shall be submitted at least 180 days prior to beginning any partial or final closure activities or at least 120 days prior to discontinuing the use of the site for waste treatment, storage or disposal, whichever is greater. The Discharger shall verify, within the Annual Monitoring Report, that the operations, as described by this Order, have not undergone any significant change.

E. Financial Assurance

Prior to the initial discharge to any WMU, the Discharger shall provide and maintain financial assurance in an amount and form acceptable to the Water Board to ensure that funds are available for closure and post-closure maintenance, as required in CCR, title 27, section 22510(f), for all constituents of concern, for all classified wastes, and for all WMUs, including reclamation of the leached and rinsed residues and other material remaining in the product ponds.

The Discharger shall submit evidence annually that adequate financial assurance, pursuant to the requirements of this Order, has been obtained or continued. Evidence may include a copy of the renewed financial instrument or a copy of the receipt for payment of the financial instrument. The Discharger shall adjust the amount of financial assurance as required to reflect changes in operation, regulatory requirements, the closure plan, or other unforeseen events.

V. TIME SCHEDULE

A. Annual Report

On or before **March 30, 2011**, and before March 30 every year thereafter, the Dischargers shall submit an annual report to the Water Board. This report shall include the items described in the General Provisions for

Monitoring and Reporting, or, if the WMUs have not yet become operative, a status report indicating a projected date for initiation of waste discharge operations.

B. Closure and Post-Closure Maintenance Plan (Closure Plan)

The Preliminary Closure Plan and cost estimates shall be updated and submitted to the Water Board annually, beginning on **March 30, 2012**. The Preliminary Closure Plan shall include an itemized and lump-sum estimate of the costs of carrying out all actions necessary to close the Facility, to prepare detailed design specifications, and to develop the final closure plan, until reclamation activities are deemed completed pursuant to applicable CCR, title 27, section 20950. Post-closure cost estimates shall be updated and included in the Closure Plan report. Estimates of post-closure maintenance costs shall include itemized and a lump-sum costs of activities that provide for post-closure maintenance and monitoring of the NWTDF, pursuant to CCR, title 27, section 21090, subsections (a-c). Cost estimates must include costs associated with corrective action activities in response to a release occurring during post-closure period.

C. Financial Assurance

1. A separate Financial Assurance Instrument(s) providing adequate funding, secured by other than corporate guarantees, for the Preliminary Closure and Post-Closure Maintenance Lump Sum Estimates in V.B. of this Order shall be submitted to the Water Board, pursuant to CCR, title 27, section 22207, by **December 30, 2011**.

2. Lump Sum Estimates of closure and post-closure shall be revised annually and submitted to the Water Board for approval as part of the Annual Report under V.A. of this Order. Each Financial Assurance Instrument(s) shall be updated accordingly and submitted to the Water Board annually, beginning on **December 30, 2011.**

D. Storm Water Pollution Prevention Plan

On or before **July 30, 2011**, the Discharger must submit to the Water Board a revised copy of the Storm Water Pollution Prevention Plan (SWPPP) for the Facility. The revised SWPPP shall include and address potential stormwater runoff from active product storage pond areas and processing plant areas, and disturbed areas during construction activities. The SWPPP shall include a description of potential pollutants, points of storm water release, best management practices, and all other items required by State Water Resources Control Board (State Water Board), Water Quality Order No. 97-03-DWQ, National Pollutant Discharge Elimination System (NPDES)

General Permit No. CAS000001 and/or State Water Board Water Quality Order No. 2009-0009-DWQ, NPDES General Permit No. CAS000002 (or any subsequent revisions or amendments), as applicable. The SWPPP must include a description of how the Discharger will manage stormwater to ensure protection of surface water including management of stormwater run-on and run-off during plant upsets under large storm event

I, Harold J. Singer, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of an Order adopted by California Regional Water Quality Control Board, Lahontan Region, on October 14, 2010.

Harold J. Singer

HAROLD J. SINGER
EXECUTIVE OFFICER

Attachments:
A. Mine Site Proposed NWTDF and Existing/Expansion Overburden Waste Piles
B. Characteristics of Paste Tailings Waste (Tailings Solids)
C. Proposed NWTDF Stage 1 Lined Area, Reclaim/Clarification Surface Impoundments
D. Proposed NWTDF Slope – Liner Design
E. Unsaturated Zone Monitoring Design
F. Clarification Pond Liner Design
G. Mine Site Map – Surface Impoundments Closure Status
H. Status of Surface Impoundments - Closure
I. Standard Provisions for Waste Discharge Requirements

CH/rp BO2010/Molycorp/R6V-2010—0047 MolycorpWDR

Molycorp Minerals LLC
Mountain Pass Mine and Mill

ATTACHMENT A
Mine Site Proposed NWTDF and
Existing/Expansion Ovrerburden Waste Piles

BOARD ORDER NO. R6V-2010-0047
WDID NO. 6B362098001

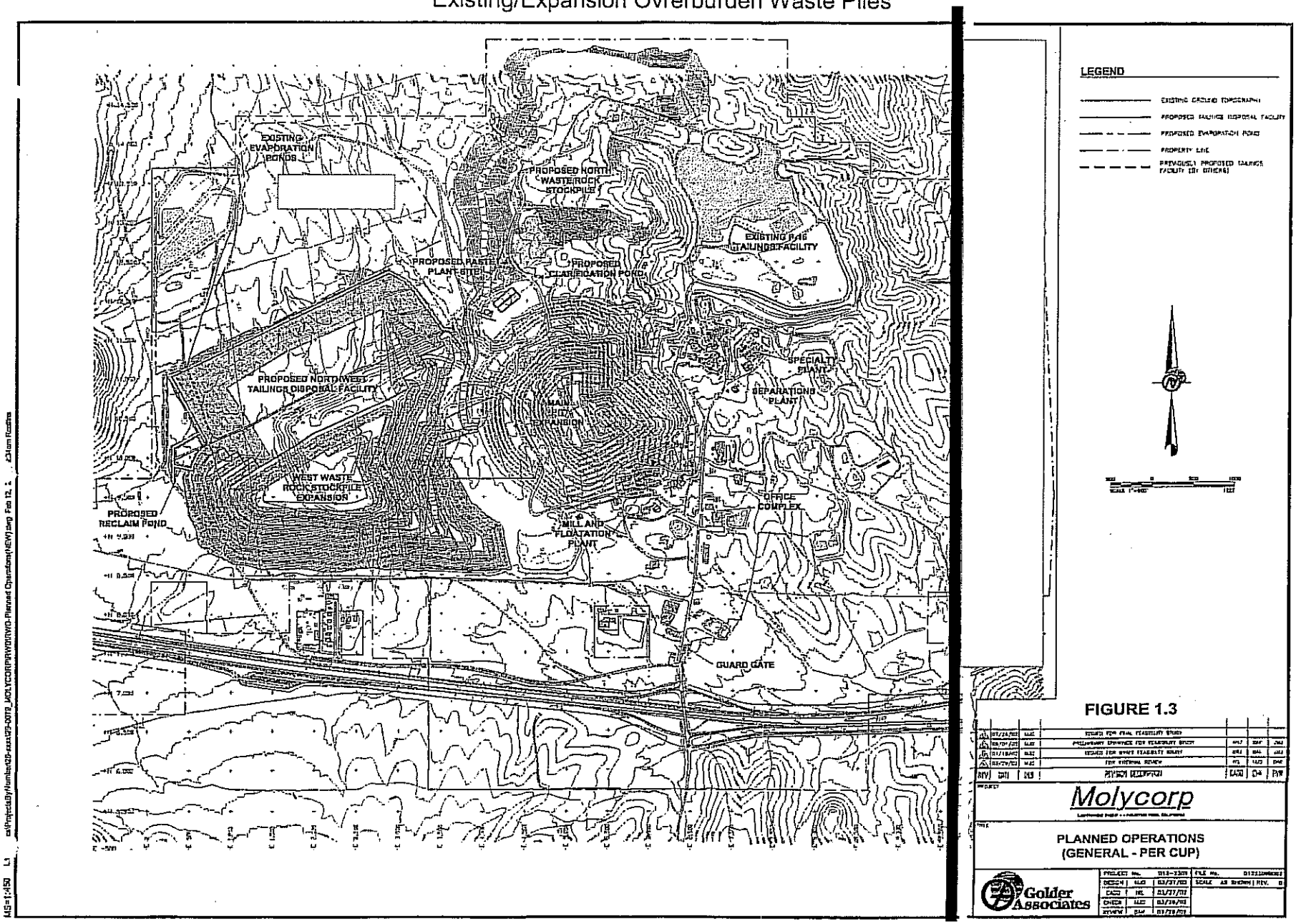


FIGURE 1.3

Molycorp

PLANNED OPERATIONS
(GENERAL - PER CUP)

Golder Associates

Characteristics of Paste Tailings Waste (Tailings Solids)

RESULTS OF CHEMICAL ANALYSIS

Sample		Amended Paste	Unamended Paste	TTLC[1]
F	%	0.21	0.23	1.8
Hg	mg/kg	0.5	0.5	20
SiO2	%	23	23	-
Ag	mg/kg	< 2	< 2	500
Al	mg/kg	18000	18000	-
As	mg/kg	200	190	500
Ba	mg/kg	7200	3400	10000
Be	mg/kg	4.3	4.3	75
Bi	mg/kg	< 20	< 20	-
Ca	mg/kg	110000	110000	-
Cd	mg/kg	< 2	< 2	100
Ce	mg/kg	7000	7900	-
Co	mg/kg	8.4	8.9	8000
Cr	mg/kg	25	21	2500
Cu	mg/kg	46	47	2500
Fe	mg/kg	28000	30000	-
K	mg/kg	12000	13000	-
La	mg/kg	4900	5400	-
Li	mg/kg	< 70	< 70	-
Mg	mg/kg	23000	23000	-
Mn	mg/kg	3000	3000	-
Mo	mg/kg	< 10	< 10	3500
Na	mg/kg	2600	2300	-
Ni	mg/kg	< 10	< 10	2000
P	mg/kg	270	600	-
Pb	mg/kg	700	1500	1000
Sb	mg/kg	< 20	< 20	500
Se	mg/kg	< 50	< 50	100
Sn	mg/kg	< 50	< 50	-
Sr	mg/kg	8600	9700	-
Th	mg/kg	< 100	< 100	-
Ti	mg/kg	340	350	-
Tl	mg/kg	< 50	< 50	700
U	mg/kg	< 40	< 40	-
V	mg/kg	31	33	2400
Y	mg/kg	52	54	-
Zn	mg/kg	50	58	5000
Ra-226	Bq/g	0.36	0.39	-
Ra-228	Bq/g	0.43	0.44	-
Th-228	Bq/g	0.48	0.47	-
Th-230	Bq/g	0.26	0.3	-
Th-232	Bq/g	0.44	0.49	-
Gross Alpha	Bq/g	7.1	6.8	-
Gross Beta	Bq/g	3.2	3.1	-

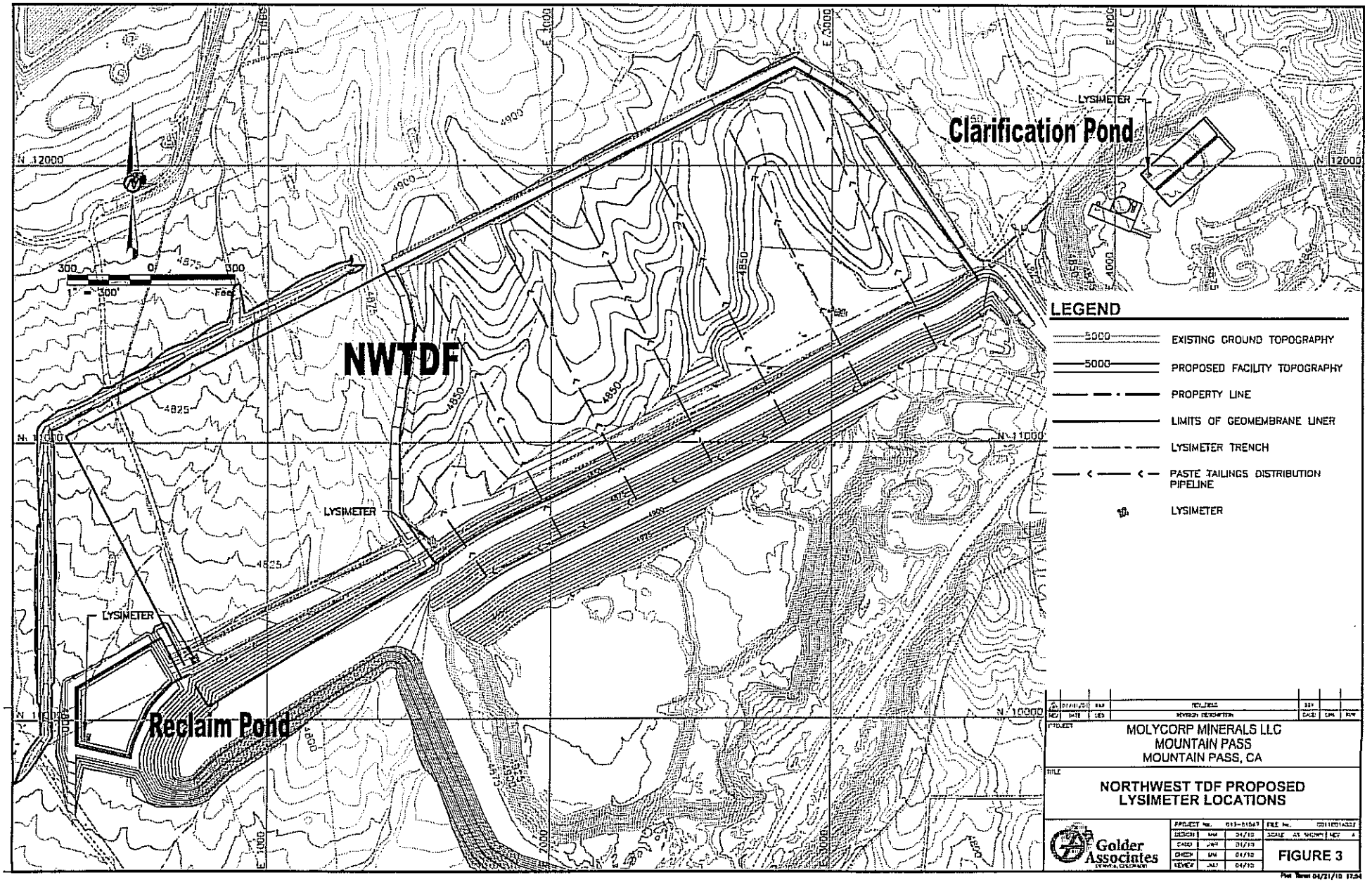
[1] - Total Threshold Limit Concentrations as per California Code of Regulations Title 22, Section 66261.24(2)(A)

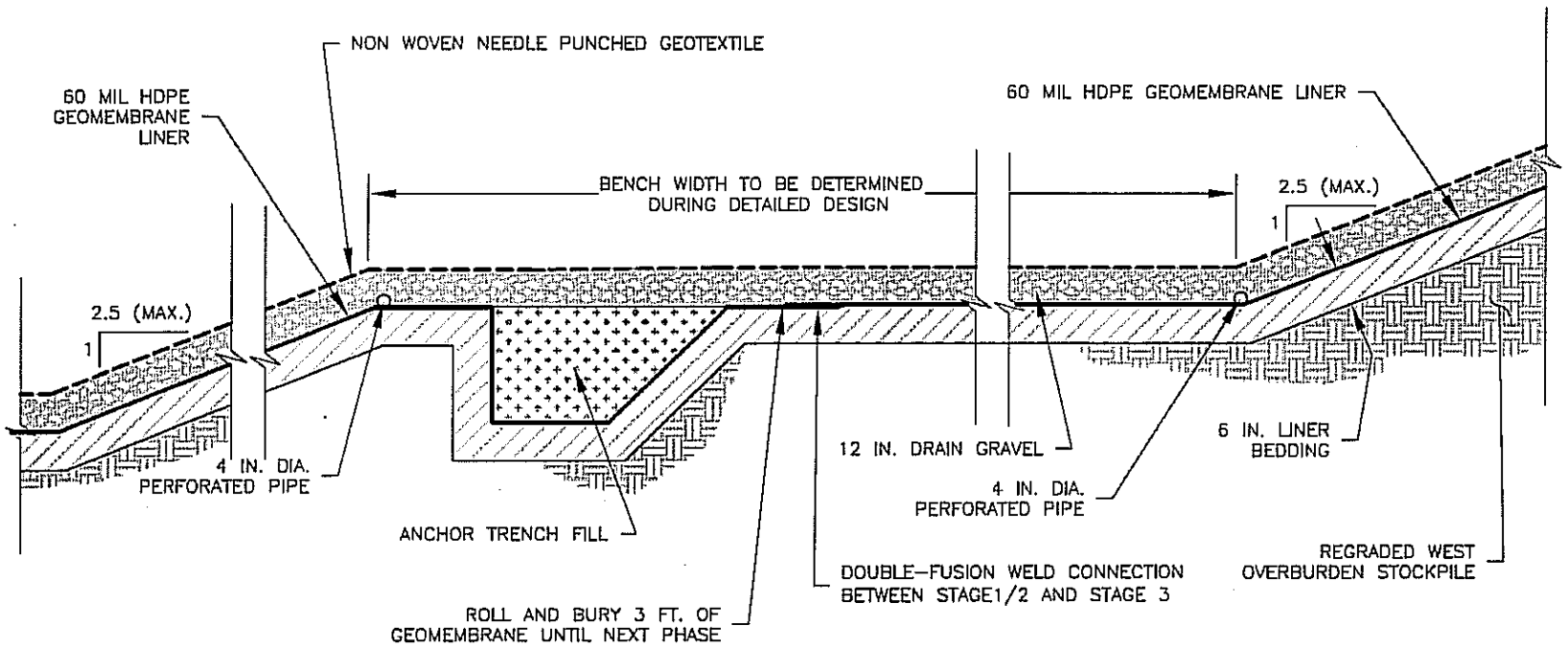
Taken from RWD, March 2010, Appendix E, Table E.2-1

Molycorp Minerals LLC
Mountain Pass Mine and Mill

ATTACHMENT C
Proposed NWTDF Stage 1 Lined Area,
Reclaim/Clarification Surface Impoundments

BOARD ORDER NO. R6V-2010-0047
WDID NO. 6B362098001





REFERENCE

1. GOLDER ASSOCIATES DRAWING 44-025-C-03 DATED 04/08/02

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
1	01/01/01	XXX	REV_DESC	XXX		

PROJECT
MOLYCORP MINERALS LLC
MOUNTAIN PASS
MOUNTAIN PASS, CA

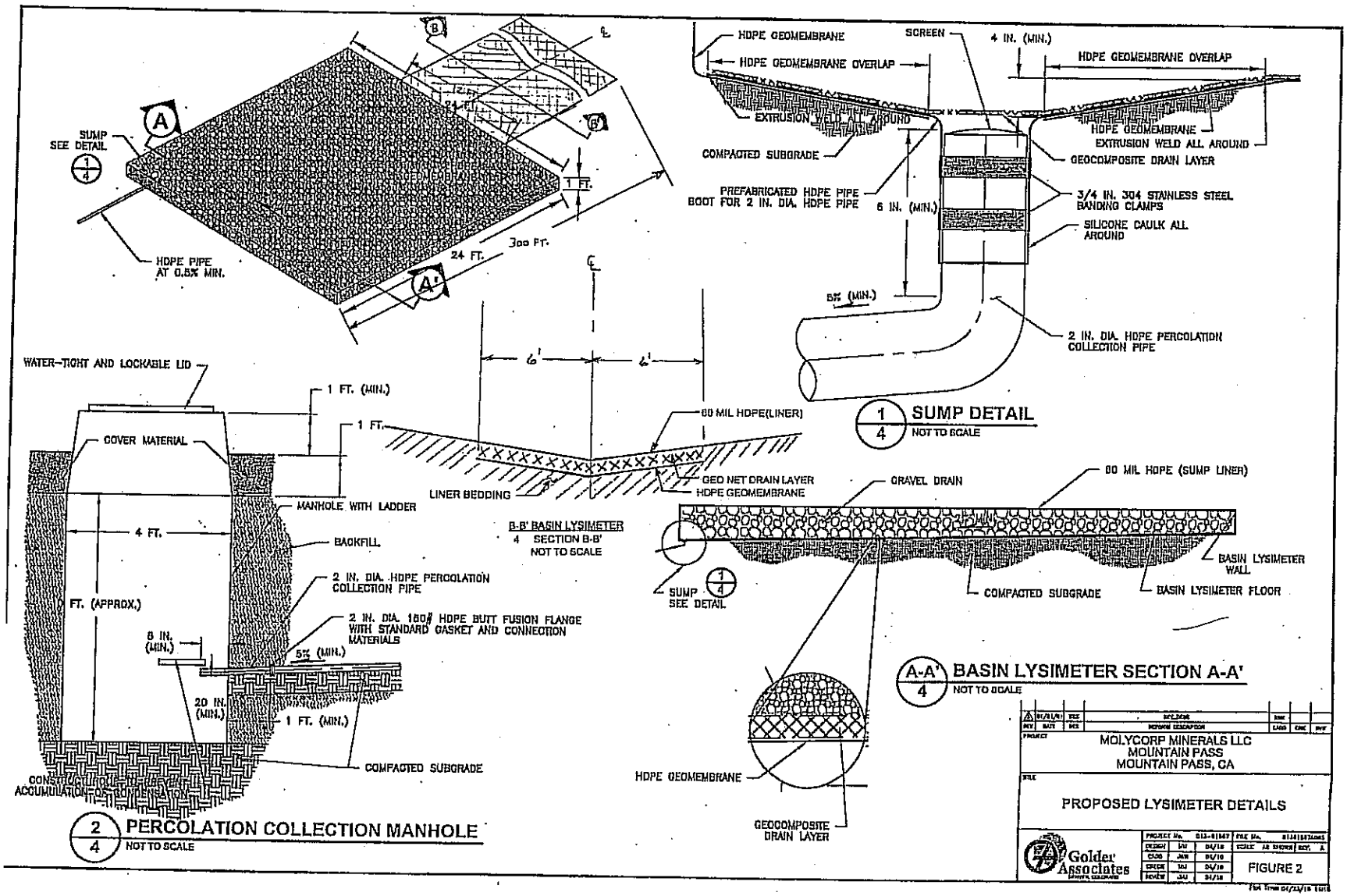
TITLE
LINER SCHEMATIC FOR NORTH SLOPE OF WEST OVERBURDEN STOCKPILE

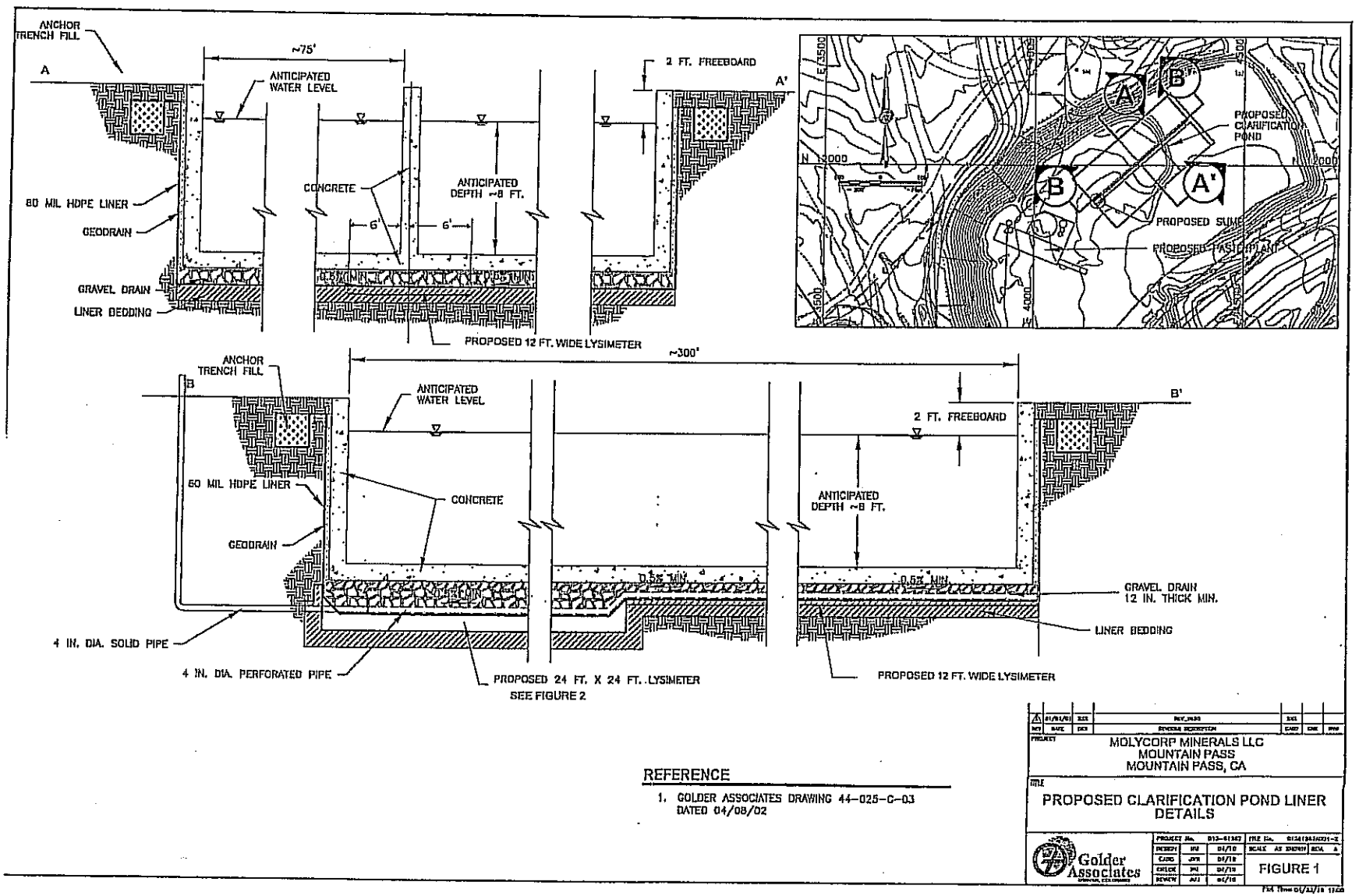
Golder Associates
DENVER, COLORADO

PROJECT No.	013-81507		FILE No.	01381507-1	
DESIGN	MM	04/10	SCALE	AS SHOWN	REV. A
CADD	JWR	04/10			
CHECK	DG	04/10			
REVIEW	JMJ	04/10			

FIGURE 1

Plot Time: 04/21/10 17:50


SUMP SEE DETAIL 1/4
HDPE PIPE AT 0.5% MIN.
1 FT.
24 FT.
300 FT.
HDPE GEOMEMBRANE
HDPE GEOMEMBRANE OVERLAP
SCREEN
4 IN. (MIN.)
EXTRUSION WELD ALL AROUND
COMPACTED SUBGRADE
PREFABRICATED HDPE PIPE BOOT FOR 2 IN. DIA. HDPE PIPE
6 IN. (MIN.)
GEOCOMPOSITE DRAIN LAYER
3/4 IN. 304 STAINLESS STEEL BANDING CLAMPS
SILICONE CAULK ALL AROUND
5% (MIN.)
2 IN. DIA. HDPE PERCOLATION COLLECTION PIPE
1 SUMP DETAIL 4 NOT TO SCALE
WATER-TIGHT AND LOCKABLE LID
1 FT. (MIN.)
COVER MATERIAL
80 MIL HDPE(LINER)
LINER BEDDING
GEO NET DRAIN LAYER
MANHOLE WITH LADDER
4 FT.
BACKFILL
B-B' BASIN LYSIMETER 4 SECTION B-B' NOT TO SCALE
FT. (APPROX.)
2 IN. DIA. 160# HDPE BUTT FUSION FLANGE WITH STANDARD GASKET AND CONNECTION MATERIALS
8 IN. (MIN.)
20 IN. (MIN.)
CONSTRUCTION TO PREVENT ACCUMULATION OF SEDIMENTATION
2 PERCOLATION COLLECTION MANHOLE 4 NOT TO SCALE
GRAVEL DRAIN
80 MIL HDPE (SUMP LINER)
BASIN LYSIMETER WALL
BASIN LYSIMETER FLOOR
HDPE GEOMEMBRANE
GEOCOMPOSITE DRAIN LAYER
A-A' BASIN LYSIMETER SECTION A-A' 4 NOT TO SCALE
MOLYCORP MINERALS LLC
MOUNTAIN PASS
MOUNTAIN PASS, CA
PROPOSED LYSIMETER DETAILS
Golder Associates
FIGURE 2



REFERENCE

1. GOLDER ASSOCIATES DRAWING 44-025-C-03 DATED 04/08/02

MOLYCORP MINERALS LLC
MOUNTAIN PASS
MOUNTAIN PASS, CA

PROPOSED CLARIFICATION POND LINER DETAILS

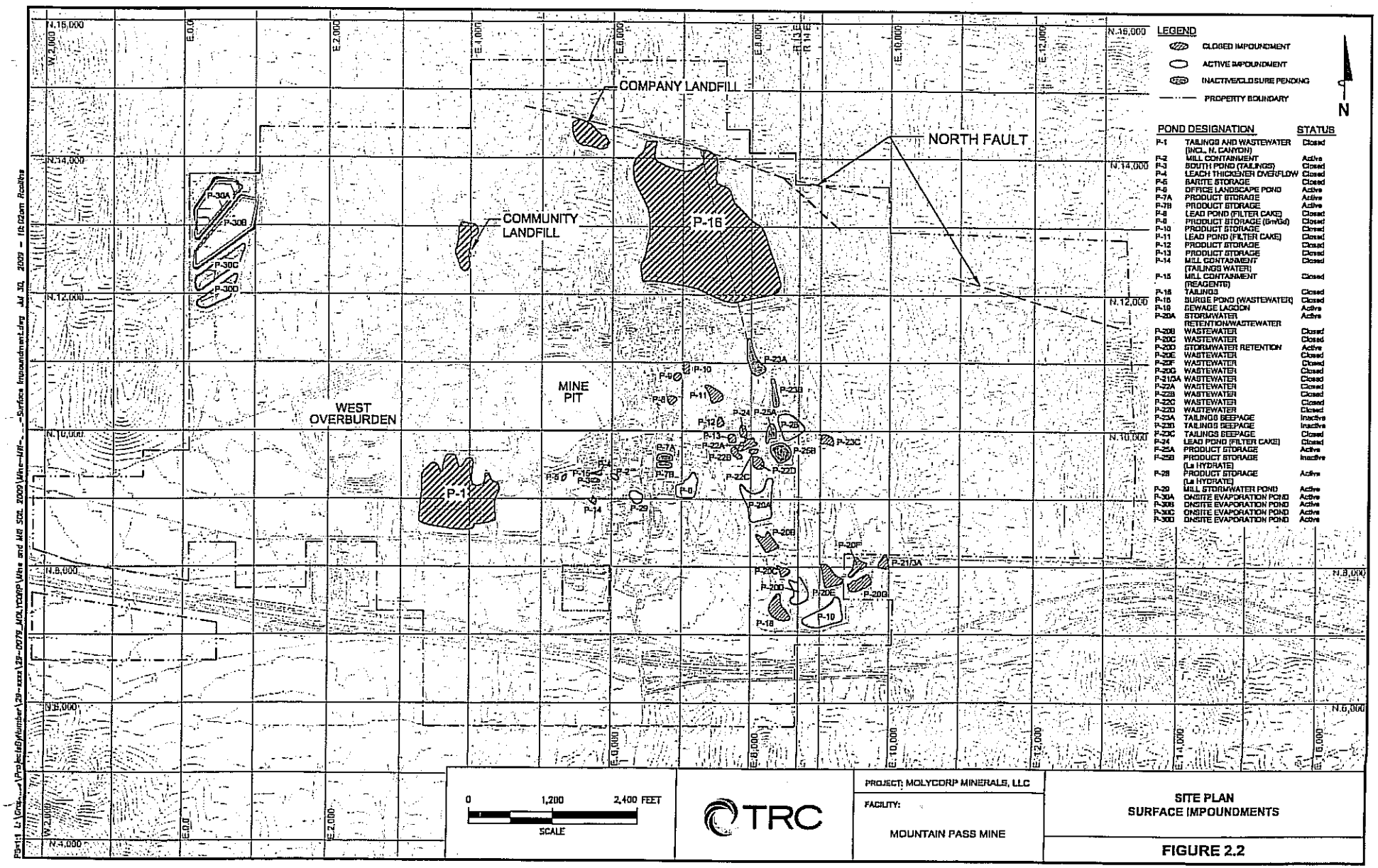
Golder Associates

FIGURE 1

Molycorp Minerals LLC.
Mountain Pass Mine and Mill

ATTACHMENT G
Mine Site Map –Surface Impoundments Closure Status

BOARD ORDER NO. R6V-2010-0047
WDID NO. 6B362098001



ATTACHMENT H

Molycorp Minerals LLC. **BOARD ORDER NO. R6V-2010-0047**
Mountain Pass Mine and Mill **Status of Surface Impoundment Closure** **WDID NO. 6B 362098001**

Ponds For Which Closure Is Complete Or Anticipated

Designation		Use	Closure Complete	Closure Planned	Closure Type	Board Order
P-1	West Tails	Tailings & Wastewater	1992		In Place	/6-00-74
P-3	South Pond	Tailings	1990		Clean	
P-4	Leach Thick O'flow	Leach Liquor		2011	Clean	
P-5	Barite Storage	Barite Product	1990		Clean	
P-8	Old Lead Pond	Lead Sulphide	2006		Clean	
P-9	Russell's Pond	Storage Sm/Gd Liquor	1987		Clean	
P-10	Above Ground concrete	Product Storage bunker	1994		Clean	
P-11	New Lead Pond	Lead Sulphide	2006		Clean	
P-12	Unlined Pond	Collect Cerium Prod.	1990		Clean	
P-13	Unlined Pond	Collect Cerium Prod.	1990		Clean	
P-14	Frost's Overflow	Tailings Water	1986		Clean	
P-15	Reagent Spillage	Mill Reagents		2011	Clean	
P-16	North Tailings Pond	Tailings Impoundment	2004		In Place	/ R6V-2004-0042
P-18	Surge Pond	Waste Management	1990		Clean	
P-20B	Wastewater		1987		Clean	
P-20C	Wastewater		1987		Clean	
P-20E	Wastewater		1987		Clean	
P-20F	Wastewater		1987		Clean	
P-20G	Wastewater		1987		Clean	
P-21/3A	Wastewater		1987		Clean	
P-22A	Wastewater		1987		Clean	
P-22B	Wastewater		1987		Clean	
P-22C	Wastewater		1987		Clean	
P-22D	Wastewater		1987		Clean	
P-23A	Seepage Collection Disposal			2011	Clean	
P-23B	Seepage Collection Disposal			2011	Clean	
P-23C	Tails Seepage	Tailings Water	1987		Clean	
P-24	Old Lead Pond	Lead Sulphide	2006		Clean	

Disposal ponds not scheduled for closure

Designation		Use	Type	Waste /Board Order
P-19	Sewage Lagoon	Sewage Treatment	Disposal	Domestic / 6-01-18
P-20A		Stormwater Run Off Control	Percolation	Stormwater/ This Order
P-29		Stormwater Run Off Control	Percolation	Stormwater/ This Order

Product storage ponds not scheduled for closure

Designation		Use	Type	Board Order
P-2	Mill Concrete Sump	Product storage after		
	Secondary Containment	Decanting Liquid	Storage	R6V-2005-0011

Product storage ponds Closure Plan Pending Approval or Planned

Designation		Use	Year submitted	Planned
P-7A	Asphalt Pad	Dry Storage Filter Cake	2000	2012
P-7B	Asphalt Pad	Dry Storage Filter Cake		2012
P-25A	Asphalt Pad	Dry Storage of Dewatered	2010	2011
		Products	2000	2011
P-25B	Membrane	Dry Product Storage After		
		Decanting Liquid	2010	2011
P-28	Membrane	Dry Product Storage After		
		Decanting Liquid	2010	2011

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

STANDARD PROVISIONS
FOR WASTE DISCHARGE REQUIREMENTS

1. Inspection and Entry

The Discharger shall permit Regional Board staff:

a. to enter upon premises in which an effluent source is located or in which any required records are kept;

b. to copy any records relating to the discharge or relating to compliance with the Waste Discharge Requirements (WDRs);

c. to inspect monitoring equipment or records; and

d. to sample any discharge.

2. Reporting Requirements

a. Pursuant to California Water Code 13267(b), the Discharger shall immediately notify the Regional Board by telephone whenever an adverse condition occurred as a result of this discharge; written confirmation shall follow within two weeks. An adverse condition includes, but is not limited to, spills of petroleum products or toxic chemicals, or damage to control facilities that could affect compliance.

b. Pursuant to California Water Code Section 13260 (c), any proposed material change in the character of the waste, manner or method of treatment or disposal, increase of discharge, or location of discharge, shall be reported to the Regional Board at least 120 days in advance of implementation of any such proposal. This shall include, but not be limited to, all significant soil disturbances.

c. The Owners/Discharger of property subject to WDRs shall be considered to have a continuing responsibility for ensuring compliance with applicable WDRs in the operations or use of the owned property. Pursuant to California Water Code Section 13260(c), any change in the ownership and/or operation of property subject to the WDRs shall be reported to the Regional Board. Notification of applicable WDRs shall be furnished in writing to the new owners and/or operators and a copy of such notification shall be sent to the Regional Board.

d. If a Discharger becomes aware that any information submitted to the Regional Board is incorrect, the Discharger shall immediately notify the Regional Board, in writing, and correct that information.

e. Reports required by the WDRs, and other information requested by the Regional Board, must be signed by a duly authorized representative of the Discharger. Under Section 13268 of the California Water Code, any person failing or refusing to furnish technical or monitoring reports, or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars ($1,000) for each day of violation.

f. If the Discharger becomes aware that their WDRs (or permit) are no longer needed (because the project will not be built or the discharge will cease) the Discharger shall notify the Regional Board in writing and request that their WDRs (or permit) be rescinded.

3. Right to Revise WDRs

The Regional Board reserves the privilege of changing all or any portion of the WDRs upon legal notice to and after opportunity to be heard is given to all concerned parties.

4. Duty to Comply

Failure to comply with the WDRs may constitute a violation of the California Water Code and is grounds for enforcement action or for permit termination, revocation and re-issuance, or modification.

5. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge in violation of the WDRs which has a reasonable likelihood of adversely affecting human health or the environment.

6. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the WDRs. Proper operation and maintenance includes adequate laboratory control, where appropriate, and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by the Discharger, when necessary to achieve compliance with the conditions of the WDRs.

7. Waste Discharge Requirement Actions

The WDRs may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for waste discharge requirement modification, revocation and re-issuance, termination, or a notification of planned changes or anticipated noncompliance, does not stay any of the WDRs conditions.

8. Property Rights

The WDRs do not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

9. Enforcement

The California Water Code provides for civil liability and criminal penalties for violations or threatened violations of the WDRs including imposition of civil liability or referral to the Attorney General.

10. Availability

A copy of the WDRs shall be kept and maintained by the Discharger and be available at all times to operating personnel.

11. Severability

Provisions of the WDRs are severable. If any provision of the requirements is found invalid, the remainder of the requirements shall not be affected.

12. Public Access

General public access shall be effectively excluded from treatment and disposal facilities.

13. Transfers

Providing there is no material change in the operation of the facility, this Order may be transferred to a new owner or operation. The owner/operator must request the transfer in writing and receive written approval from the Regional Board's Executive Officer.

14. Definitions

a. "Surface waters" as used in this Order, include, but are not limited to, live streams, either perennial or ephemeral, which flow in natural or artificial water courses and natural lakes and artificial impoundments of waters. "Surface waters" does not include artificial water courses or impoundments used exclusively for wastewater disposal.

b. "Ground waters" as used in this Order, include, but are not limited to, all subsurface waters being above atmospheric pressure and the capillary fringe of these waters.

15. Storm Protection

All facilities used for collection, transport, treatment, storage, or disposal of waste shall be adequately protected against overflow, washout, inundation, structural damage or a significant reduction in efficiency resulting from a storm or flood having a recurrence interval of once in 100 years.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

REVISED
MONITORING AND REPORTING
PROGRAM NO. R6V-2010-0047

WDID NO. 6B362098001

FOR

MOLYCORP MINERALS LLC
MOUNTAIN PASS MINE AND MILL OPERATIONS

San Bernardino County

I. WATER QUALITY PROTECTION STANDARD

Pursuant to California Code of Regulations (CCR), title 27, section 22500, subsection (a), new Group B Mining Units shall comply with the monitoring provisions contained in CCR, title 27, sections 20385 through 20430. A Water Quality Protection Standard (WQPS) is required by CCR, title 27, section 20390, to assure the earliest possible detection of a release from the Group B Tailings Waste Pile (northwest tailings disposal facility [NWTDF]) and Group B Surface Impoundments (Reclaim and Clarification Ponds) to the underlying soil and/or groundwater. The WQPS for the NWTDF and the Reclaim Pond shall consist of all constituents of concern, the respective concentration limit (reference background data set) for each constituent of concern at each water quality monitoring point, the point of compliance, and all water quality monitoring points. The WQPS for the Clarification Pond will consist of pan lysimeter (an unsaturated zone monitoring device) monitoring instead of groundwater monitoring.

A. Definition of Terms

1. "Monitored Media" includes the saturated zone and unsaturated zone, per CCR, title 27, section 20415.

2. "Constituent(s) of Concern or COC(s)" means any waste constituent(s), reaction product(s), and hazardous constituent(s) that is reasonably expected to be in or derived from waste contained in a Waste Management Unit(s) (WMU) (CCR, title 27, section 20164). The COCs for the WMUs at this Facility are listed in Attachments A, B, C and F to this Monitoring and Reporting Program (MRP).

3. "Monitoring parameter" means one of the set of parameters specified in the waste discharge requirements for which monitoring is conducted. Monitoring parameters include physical parameters, waste constituents, reaction products, and hazardous constituents that provide a reliable

indication of a release from a WMU (CCR, title 27, section 20164). The monitoring parameters for the WMUs at this Facility are listed in Attachments A, B, C and F to this MRP.

II. MONITORING

The Discharger must comply with the Detection Monitoring Program (DMP) monitoring provisions pursuant to CCR, title 27, section 20385. The Discharger must also monitor the Group B Surface Impoundments water and solids quality (grab samples), and freeboard, the NWTDF solids content, the leachate collection and recovery systems, and liner integrity of all three Group B WMUs.

A. Paste Tailings Discharge

The Discharger must measure and record the following:

1. Monthly, the volume of paste tailings, which includes the percent of amendments, discharged to the NWTDF, in million gallons;

2. Quarterly, the cumulative total of paste tailings discharged to the NWTDF, in million gallons; and

3. Quarterly, the remaining capacity for the NWTDF.

B. Group B Waste Management Units Monitoring

1. Dikes and Liners

a. Weekly, measure and record the freeboard, as measured from the top of the lowest part of the dike to the wastewater surface, in the Reclaim, reclaim channel, and Clarification Ponds. Indicate if either or both are dry, if applicable.

b. Weekly, inspect the integrity of the Reclaim and Clarification Ponds dikes and liners. Should the inspection indicate that any unauthorized discharge has occurred, or may occur, the Water Board must be notified by phone within 48 hours, followed by confirmation in writing within seven days.

c. Quarterly, inspect the integrity of the side slopes, liner system, and all drainage structures and LCRS sump of the NWTDF. Should the inspection indicate that any unauthorized discharge has occurred, or may occur; the Water Board must be notified by phone within 48 hours, followed by confirmation in writing within seven days.

C. Product Pond Liner Integrity

Weekly, inspect the integrity of the active Product Pond dikes and liners.

D. Leachate Collection and Recovery System Monitoring

The Discharger shall conduct the following inspections and testing of the leachate collection and recovery system (LCRS) for the Reclaim and Clarification Ponds and report results in the Quarterly Monitoring Reports:

1. Weekly, visual inspection for liquid in the leakage detection sumps must be conducted. The results of those inspections must be recorded in a paper or electronic log.

2. Any volume of liquid since last pumped out of the leakage detection sumps must be recorded along with date, time and discharge location, in a paper or electronic log kept on-site. Report this volume in total gallons and as calculated gallons per day per acre.

3. Annually, each LCRS shall be tested to demonstrate proper operation. The results of the testing shall be submitted in the annual monitoring reports. The annual report shall include a description of the method used to test each LCRS.

4. Leak Rates
The factors set by the Water Board and used to calculate the Action Leakage Rates for the Reclaim and Clarification Ponds are shown Table 1 – LCRS Action Leakage Rates.

TABLE 1. LCRS ACTION LEAKAGE RATES

Surface Impoundment	Surface Area (Acres)	Reporting Leakage Rate Gallons per day (gpd)	(gpd/acre)
Reclaim Pond	2	480	240
Clarification Pond	1.1	260	240
		Rapid and Large Leakage Rate gallons per day (gpd)	**(gpd/acre)**
Reclaim Pond	2	3,966	1,983
Clarification Pond	1.1	1,227	1,116

5. Action Response Plan

If liquids are detected in the LCRS Surface Impoundment sumps, the Discharger shall respond as set out in Table 2- Action/Response Levels – LCRS for Surface Impoundments below:

TABLE 2. ACTION/RESPONSE LEVELS – LCRS FOR SURFACE IMPOUNDMENTS

Unit Flow Rate (gpd/acre)	Action/Response
Less than (<) 240[1]	No action required. Record weekly flow rate and submit recorded flow rates with the next Quarterly Report.
Greater than (>) 240 < 1,983[2] or > 240 < 1,116[3]	Notify the Water Board immediately. Record daily flow rate and watch for trends. Submit recorded flow rates with the next regularly scheduled Quarterly Report.
> 1,983[2] or > 1,116[3]	Notify the Water Board as described in IV.B.2 in this MRP. Remove process solutions. Inspect and repair liner. The Discharger shall immediately collect a grab sample of the leachate and shall sample and analyze for the parameters and at the frequencies identified in Table A – Surface Impoundments LCRS Liquid Monitoring, Attachment "A," which is attached to and made part of this Monitoring and Reporting Program.

[1] Condition applicable to the Reclaim and Clarification Ponds LCRS.
[2] Condition applicable to the Reclaim Pond LCRS.
[3] Condition applicable to the Clarification Pond LCRS.

E. Group B Surface Impoundments Monitoring

1. Wastewater

When wastewater is present, one (1) liquid grab sample must be collected from each of the Group B Surface Impoundments and each sample analyzed for the parameters and constituents and at the frequencies listed in Table B -Surface Impoundment Waste Monitoring, Attachment "B," which is made part of this MRP. Indicate in the Quarterly Report if no wastewater is present in each Surface Impoundment, as applicable, for that period.

2. Solid Wastes

   Two (2) representative grab samples of the settled solids in each wastewater Surface Impoundment, if present, must be collected and analyzed for the constituents and at the frequencies listed in Table B-Surface Impoundment Waste Monitoring, Attachment "B."

F. Paste Tailings Solid Waste Monitoring

1. Quarterly, a representative number of samples required to adequately characterize the volume of paste tailings solids discharged to the NWTDF during that reporting period must be collected and analyzed for the constituents listed in Table C-Paste Tailings Waste Monitoring, Attachment "C," which is made part of this MRP. Indicate in the Quarterly Report if no paste tailings discharge occurred for that period.

2. For each lift of paste tailings placed, the following will be measured in the field on in-place tailings after the tailings have consolidated approximately two weeks:

   a. the percent moisture (%); and

   b. dry density (pounds per cubic foot).

3. Weekly, during the initial 90 days of operation, then monthly thereafter, test for free water in paste tailings discharged at the discharge point to the NWTDF, using the method defined in this Order[1].

G. Solid Waste Sampling Analyses

Solid waste samples of the paste tailings must be tested and analyzed in accordance with CCR, title 22, section 66261.24, for those constituents of concern in Table C (Attachment C), using, where applicable:

1. The Waste Extraction Test (WET) if the total concentration for a constituent in the sample exceeds 10 times the Soluble Threshold Limit Concentration (STLC), and

2. The Toxicity Characteristic Leaching Procedure (TCLP) if the total concentration for a constituent in the sample exceeds 20 times the TCLP limit (as listed in U.S. Code Part 40, 261.24).

[1] Free liquids are not present when a 100 milliliter representative sample of the waste can be completely retained in a standard 400 micron conical paint filter for 5 minutes without loss of any portion of the waste from the bottom of the filter (or an equivalent test approved by the California Department of Toxic Substances Control).

H. Detection Monitoring

Monitoring of the groundwater and unsaturated zone must be conducted in accordance with the Detection Monitoring Program (DMP) to provide the best assurance of the early detection of any releases from the discharge sites. All samples, with the exception of field parameters, must be analyzed by a California state-certified laboratory. Using statistical or non-statistical data analysis methods approved in Board Order No. R6V-2010-0047 (Board Order), the Discharger must, for each groundwater monitoring event, compare the concentration of each monitoring parameter with its respective concentration limit to determine if there has been a release from the NWTDF or the Reclaim Pond. Monitoring must be completed as follows:

1. Unsaturated Zone Monitoring - Lysimeters

   a. Weekly, the Discharger must monitor the unsaturated zone beneath the Reclaim and Clarification Ponds and the NWTDF. The Discharger must check for moisture using pan lysimeters (or equivalent monitoring device) installed beneath the LCRS collection sumps. Unsaturated Zone monitoring beneath the NWTDF may be reduced to quarterly after the first year, post initial discharge, provided leachate release has not been detected. The locations of the proposed lysimeters are shown on Attachment "C" to the Board Order.

   b. If liquid is detected in the lysimeters, field verification testing must be performed and the Discharger must notify the Water Board and report a preliminary physical evidence of a release (see notification procedures below). Verification testing must include laboratory analyses of liquids drawn from the lysimeter. Liquid quality must be compared to the wastewater monitoring parameters in the Surface Impoundment and/or the liquid collected from the LCRS, if present. The results of this comparison must be part of a release evaluation report submitted to the Water Board.

   c. Annually, the Discharger must submit documentation of unsaturated zone monitoring instrument maintenance and performance checks, including quality assurance/quality controls.

2. Groundwater Monitoring

   a. Point of Compliance and Monitoring Points

      The Point of Compliance as defined in CCR, title 27, section 20405, is "a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying

the Unit." Proposed and existing compliance groundwater monitoring wells downgradient of the NWTDF, Reclaim Pond, and Product Pond P-28, that will be used in the DMP are listed in Table 3. below. Background monitoring wells upgradient to the NWTDF, Reclaim Pond and Product Pond P-28 are also listed in Table 3. Monitoring well locations are shown on Attachment "D" Groundwater Monitoring Points, NWTDF and Reclaim Pond, and Attachment "E" Groundwater Monitoring Points, Product Pond P-28, attached to and made part of this MRP. Replacement of any monitoring wells must provide equal performance for complying with the Water Quality Performance Standards and must be approved by the Water Board.

TABLE 3. GROUNDWATER MONITORING POINTS AND MONITORING FREQUENCIES

Well	Type	WMU	Status	Frequency
98-9MW	Upgradient	NWTDF	Existing	Quarterly
98-5MW	Upgradient	NWTDF	Existing	Quarterly
98-2MW	Compliance	NWTDF/ Reclaim Pond	Existing	Quarterly
TDFMW-1	Compliance	NWTDF	Proposed	Quarterly
TDFMW-2	Compliance	NWTDF	Proposed	Quarterly
2001-3MW	Upgradient	P-28	Existing	Quarterly
2001-4RMW	Compliance	P-28	Existing	Quarterly

b. Monitoring Parameters and Constituents of Concern

Water samples must be collected at the frequency and locations listed in Table 3 – Groundwater Monitoring Points and Monitoring Frequencies in this MRP, and for the monitoring parameters and COCs as listed in Table D–Groundwater Monitoring, in Attachment "F," which is attached to and made part of this Monitoring and Reporting Program.

c. Concentration Limits

The Discharger has not collected background water quality data for the constituents of concern contained in this MRP for the proposed two compliance wells downgradient of the NWTDF. The Discharger must collect at least eight quarters of groundwater quality data to determine background concentration limits for the constituents of concern. The Discharger must submit a complete Water Quality Protection Standard to the Water Board, which includes concentration limits (a background data set for each COC at each compliance well, preferably the intrawell type) that define background water quality for each constituent of concern, respectively, at each compliance well.

d. Aquifer Characteristics

Quarterly, the most recent groundwater potentiometric surface must be illustrated on an 8.5- by 11-inch copy of a site plan showing the parameters listed in the Table 4 in this MRP, and include the monitoring well locations, the NWTDF, Surface Impoundments, and Product Storage Ponds.

TABLE 4. AQUIFER CHARACTERISTICS

Parameter	Units
Depth to Groundwater	Feet below ground surface (bgs)
Static Water Level	Feet above mean sea level
Slope of Groundwater Gradient	Feet/feet
Direction of Groundwater Gradient	Degrees from North
Velocity of Groundwater Flow	Feet/year

e. Annually, water quality analyses of samples from the monitoring wells listed in Table 3 of this MRP (or their replacement), must be reported in the annual report in both tabular and graphical form. Each table must summarize the historical and most recently detected constituents of concern concentrations and monitoring parameters for all wells sampled using an appropriate statistical analysis method. Graphs must be plotted at a scale appropriate to show trends or variations in water quality. For graphs showing the trends of similar constituents, the scale must be the same.

I. Monitoring for Windblown Tailings Solids

Quarterly, the Discharger must monitor for windblown tailings solids from the NWTDF. Monitoring must include both visual inspection and at least two (2) particle sampling stations downwind (based on prevailing wind pattern at the site) of the NWTDF. Additional weather data to be collected and included in the monitoring report are wind speed, wind direction, and precipitation, at a minimum.

If monitoring results show significant particulate detections are occurring downwind as compared to upwind of the site, the Discharger shall describe such incidents in quarterly monitoring reports. If the source of particulate matter is determined to be windblown tailings solids from the NWTDF, the Discharger will improve controls for windblown tailings and report any significant changes made to the system.

III. DATA ANALYSIS

A. General Nonstatistical Data Analysis Methods

Non-statistical evidence of a release from the NWTDF, Surface Impoundments product storage ponds, and associated tailings waste conveyance system shall also be evaluated. The Discharger must notify the Water Board immediately of a release and include results in each quarterly report. Non-statistical analyses shall be as follows:

1. Unsaturated Zone

   For detected liquid in the unsaturated zone, laboratory analyses of the liquid sampled in the unsaturated zone monitoring devices are to be compared to water quality to tailings wastewater sampling. Results of this evaluation must be reported as described in section IV. B.1. of this MRP.

2. Physical Evidence

   Physical evidence of a release can include liquid detected in unsaturated zone monitoring devices (or pan lysimeters), vegetation loss, soil discoloration, or groundwater mounding.

B. Statistical Data Analysis Methods

In order to determine if any new releases to groundwater have occurred from the NWTDF, Reclaim Pond, and P-28, evaluation of data will be conducted using statistical analysis methods. The Discharger has proposed to use intra-well type of concentration limits for the groundwater monitoring detection monitoring program. Background water quality for the constituents of concern and monitoring parameters have been established for existing monitoring wells and will be established for the new monitoring wells. Background data for the compliance wells will be updated and evaluated in two-year intervals after qualifying for inclusion using appropriate statistical methods. If detection frequency of a constituent of concern in a compliance monitoring point is less than 25 percent, a verified exceedance is indicated when a nonparametric control limit is exceeded for two consecutive sampling events (pass 2 of 2 verification resampling procedures).

C. Verification Procedures

1. The Discharger may immediately initiate verification procedures, as specified below, whenever there is a determination by the Discharger or Water Board Executive Officer that there is evidence of a release. If the Discharger declines the opportunity to conduct verification procedures,

the Discharger shall submit a technical report as described below under the heading Technical Report without Verification Procedures.

2. The verification procedures shall only be performed for the constituent(s) that has shown a measurably significant evidence of a release, and shall be performed for those Monitoring Points at which a release is indicated.

3. If a determination is made that there is evidence of a release using the Upper Prediction Limit or Shewhart CUSUM Methods, the Discharger may, within 30 days of such determination, update the Upper Tolerance Limit and reevaluate Point of Compliance data in order to verify evidence of a release from the WMUs. The Discharger must also collect two additional samples from the affected Monitoring Points and compare the results to the updated Upper Tolerance Limit.

4. The Discharger shall either conduct a composite retest using data from the initial sampling event with all data obtained from the resampling event or shall conduct a discrete retest in which only data obtained from the resampling event shall be analyzed to verify evidence of a release.

5. The Discharger shall report to the Water Board Executive Officer by certified mail the results of the verification procedure, as well as all concentration data collected for use in the retest within seven days of the last laboratory analysis.

6. If the Discharger or Executive Officer verifies evidence of a release, the Discharger is required to submit a technical report, within 90 days of such a determination that there is, or was, a release, pursuant to Section 13267(b) of the California Water Code. The report shall propose an Evaluation Monitoring Program, OR, make a demonstration to the Water Board that there is a source other than the WMUs that caused evidence of a release.

D. Technical Report Without Verification Procedures

If the Discharger chooses to not initiate verification procedures after there has been a determination made for evidence of a release, a technical report shall be submitted pursuant to Section 13267(b) of the California Water Code. The report shall propose an evaluation monitoring program, OR, attempt to demonstrate that the release did not originate from the WMUs.

IV. RECORD KEEPING AND REPORTING REQUIREMENTS

A. Scheduled Reports To Be Filed With The Water Board

Periodic reports must be submitted to the Water Board as specified below.

1. Quarterly Monitoring Reports

The Discharger must submit the following quarterly monitoring data:

a. Results of groundwater sampling analyses, including statistical limits for each monitoring parameter and constituent of concern at each groundwater compliance monitoring point;

b. A description and graphical presentation of the velocity and direction of groundwater flow under/around the NWTDF, Surface Impoundments and product storage ponds, and be based upon the water-level elevations taken during the collection of the water quality data submitted in the report;

c. A map and/or aerial photograph showing the locations of observation stations, monitoring points, background monitoring points, and the point of compliance along the downgradient boundary of the, Reclaim Pond, NWTDF and P-28;

d. Surface Impoundments monitoring, flow monitoring, liquid quality analyses, and an evaluation of the effectiveness of the leachate monitoring and control facilities, and of the runoff/runon control facilities;

e. NWTDF monitoring, waste discharge volumes, and solids analyses;

f. Data collected in accordance with an approved Monitoring and Reporting Plan and Sampling and Analysis Plan for unsaturated zone monitoring and groundwater monitoring wells; and

g. An *Executive Summary* included in the monitoring report that includes the essential points in each report, including a discussion of any requirement violations found since the last report was submitted and describing actions taken or planned for correcting those violations. If the Discharger has previously submitted a detailed time schedule for correcting requirement violations, a reference to the correspondence transmitting this schedule will be satisfactory. If no violations have occurred since the last submittal, this must be stated in the letter of transmittal.

2. Annual Monitoring Reports

The Discharger must submit an annual report to the Water Board. The annual report can be combined with the monitoring report for the last reporting period of that year. If so, the report must include (for that last reporting period) the information under Section IV.A.1 of this MRP, plus the following annual summary information:

a. A list of all monitoring point/monitoring parameter (MPt/MPar) pairs, by medium, that have exhibited a verified measurably significant increase, together with the respective date (for each) when that increase occurred. Any MPt/Mpar pairs that have shown an increase within that (prior) year shall be bolded-and-underlined. In addition, by medium, list any COCs that have been detected above background and which are now included with the list of monitoring parameters during that (prior) year, together with the date when that transition occurred.

b. Time-series data graphs for each MPt/Mpar showing historical groundwater, and lysimeter liquid analyses. Graphs must show trends and sample data compared to their respective control limit calculated from the MPt background dataset.

c. Four maps, one for each quarter of the last reporting year, showing the groundwater elevation iso-contours determined for that quarter and showing the Surface Impoundments perimeter and the groundwater monitoring point and background monitoring point locations.

d. Graphical and tabular displays of the monitoring data obtained for the historical monitoring data.

e. Calibration methods and any flow discrepancies of the wastewater flow meters after calibration is performed, if applicable.

f. The compliance record and any corrective actions taken or planned, which may be needed to bring the discharge into full compliance with the discharge requirements.

g. Evidence that adequate financial assurances for closure, post-closure maintenance is still in effect. Evidence may include a copy of the renewed financial instrument or a copy of the receipt for payment of the financial instrument. Evidence of adequate financial assurance must be signed by the Corporate Officer or issuing institution when applicable.

h. Evidence that the financial assurance amount is adequate or increase the amount of financial assurance by an appropriate amount if necessary, due to inflation, a change in the approved closure plan, or other unforeseen events.

i. The Discharger must review the preliminary closure plan, post-closure maintenance plan, annually to determine if significant changes in the operation of the WMU warrant an update to any of these plans. Changes to these plans must be submitted to the Water Board in the annual report.

3. Five-Year Groundwater Monitoring Reports

Every five years, report results of samples analyzed for the constituents in groundwater as described in Tables B and D (Attachments B and F, respectively). Any such constituent that exceeds their respective background Threshold Value at any compliance well both initially and (given such an indication) in a retest sample, becomes a monitoring parameter, automatically, at each compliance well, beginning with the following reporting period.

B. Unscheduled Reports To Be Filed With The Water Board

The following reports must be submitted to the Water Board as specified below:

1. Release from the WMUs

The Discharger must perform the procedures contained in this subsection whenever there is evidence of a release from the WMUs.

a. Physical or Measurably Significant Evidence of a Release from WMUs

The Discharger must immediately notify the Water Board verbally whenever a determination is made that there is physical or measurably significant evidence of a release from any of the WMUs. This verbal notification must be followed by written notification via certified mail within seven days of such determination. Upon such notification, the Discharger may initiate verification procedures or demonstrate that another source other than the WMUs caused evidence of a release (see below).

The written notification must include the following information:

i. The WMU that may have released or be releasing;

ii. General information including the date, time, location, and cause of the release;

iii. An estimate of the flow rate and volume of waste involved;

iv. A procedure for collecting samples and description of laboratory tests to be conducted;

v. Identification of any water-bearing media affected or threatened;

vi. A summary of proposed corrective actions; and

vii. For measurably significant evidence of a release – the monitoring parameters and/or constituents of concern that are involved in the measurably significant evidence of a release from the WMUs;

viii. For physical evidence of a release – physical and chemical factors that indicate physical evidence of a release.

b. Other Source That May Cause Evidence of a Release From WMUs

The Discharger may make a demonstration that a source other than the WMUs caused evidence of a release. For this case, the Discharger must notify the Water Board of the intention to make this demonstration. The notification must be sent to the Water Board by certified mail within seven days of determining physical or measurably significant evidence of a release.

2. Exceeding the Action Leakage Rate

Exceeding the Rapid and Large Action Leakage Rate in Section II.D. of this Board Order is an Adverse Condition. The Discharger must notify the Water Board verbally within 24-hours whenever a determination is made that leakage into the LCRS exceeds the Rapid and Large Action Leakage Rate. This verbal notification must be followed by written notification via certified mail within 7-days of such determination. This written notification must be followed by a technical report via certified mail within 30 days of such determination. The technical report must describe the actions taken to abate the adverse condition and must describe any proposed future actions to abate the adverse condition.

3. Unsaturated Zone Release

The Discharger must notify the Water Board verbally within 24 hours whenever a determination is made that a release into the unsaturated zone has occurred. This verbal notification must be followed by written notification via certified mail within 7 days of such determination. This written notification must be followed by a technical report via certified mail

within 30 days of such determination. The technical report must describe corrective actions taken and must describe any proposed future corrective actions.

4. Evaluation Monitoring Program

The Discharger must, within 90 days of verifying a release, submit a technical report, pursuant to the California Water Code, section 13267, subsection (b), proposing an Evaluation Monitoring Program (EMP). If the Discharger decides not to conduct verification procedures, or decides not to make a demonstration that a source other than the WMU is responsible for the release, the release will be considered verified.

The Discharger must, within 90 days of determining "measurably significant" evidence of a release, submit to the Water Board an amended report of waste discharge to establish an evaluation monitoring program meeting the provisions of CCR, title 27, section 20420, subsection (k)(5). The report must include the following information:

a. Constituents of Concern (COC) Concentrations — the maximum concentration of each COC at each Monitoring Point as determined during the most recent COC sampling event (i.e., under CCR, title 27, section 20420 subsection (g) or (k)(1));

b. Proposed Monitoring System Changes — any proposed changes to the water quality monitoring systems at the Surface Impoundments necessary to meet the provisions of CCR, title 27, section 20425;

c. Proposed Monitoring Changes — any proposed additions or changes to the monitoring frequency, sampling and analytical procedures or methods, or statistical methods used at the Surface Impoundments necessary to meet the provisions of CCR, title 27, section 20425; and

d. Proposed Delineation Approach — a detailed description of the measures to be taken by the Discharger to assess the nature and extent of the release from the Surface Impoundments.

5. Preliminary Engineering Feasibility Study

The Discharger must, within 180 days of verifying the release, submit a Preliminary Engineering Feasibility Study (CCR, title 27, section 20420, subsection (k)[6]) for corrective action.

6. Adverse Conditions

The Discharger must notify the Water Board of any adverse condition in accordance with the notification procedures specified in Item 2.a of the attached "Standard Provisions for Waste Discharge Requirements." Adverse conditions include but are not limited to:

a. Slope failure,

b. Discharge of wastes outside of WMUs, or

c. Evidence of any release from the WMUs.

V. REPORTING

The Discharger must comply with the following reporting requirements:

A. General Provisions

The Discharger must comply with the "General Provisions for Monitoring and Reporting," dated September 1, 1994, in Attachment "G," which is attached to and made part of this Monitoring and Reporting Program.

B. Violations revealed by Monitoring

If monitoring data indicate violation of Board Order, the Discharger must provide information indicating the cause of violation(s) and action taken or planned to bring the discharge into compliance.

C. Failure to Furnish Reports

Any person failing or refusing to furnish technical or monitoring reports or falsifying any information provided therein is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars ($1,000) for each day of violation under California Water Code, section 13268.

D. Summary of Reporting Frequency

On **January 30, 2011**, the first of the regular Quarterly Monitoring Reports, including any data collected prior to this date, must be submitted to the Water Board. Subsequent monitoring reports must be submitted to the Water Board by the **30th** day of the month following each monitoring period, according to the following schedule:

Quarterly Report

Quarter	Monitoring Period	Due Date
1st	January 1 — March 31	April 30
2nd	April 1 — June 30	July 30
3rd	July 1 — September 30	October 30
4th	October 1 — December 31	January 30

Annual Report

	January 1 — December 31	March 30

E. Technical Reports

Pursuant to California Water Code, section 13267, subdivision (b):

1. The Discharger must submit to Water Board, for review and acceptance, any revisions to the following revised documents at least 90 days prior to the start of construction of the proposed WMUs: Construction Design Plans; Construction Drawings and Specifications; Cut and Fill Plans, Slope Stability Analysis, and Construction Quality Assurance Plan.

2. No **later than 180 days following** installation of the WMU, the Discharger must prepare a Final Documentation Report concerning the construction and placement of the containment system for each WMU, as required in CCR, title 27, section 20324,. This document must provide all reports prepared during construction that show evidence that the Construction Quality Assurance Plan was implemented, as proposed, and that the construction proceeded in accordance with design criteria, plans, and specifications. The Discharger must submit copies of the Final Documentation Report to the Water Board, and certified as prepared by the Construction Quality Assurance officer.

3. No **later than 45 days following** installation of the monitoring wells and lysimeters, and any future monitoring well replacements, the Discharger must submit a technical report discussing the installation of the monitoring system. The report must summarize all work activities associated with the installation of the groundwater and lysimeter monitoring systems. The report must be certified by a registered civil engineer or a certified engineering geologist. It must contain sufficient information to verify that construction was in accordance with State and/or County well standards.

4. **No later than the 30th day following the first eight quarters** of monitoring of any new compliance well, the Discharger must propose for approval by the Water Board's Executive Officer concentration limits that define background water quality in the form of a concentration limit (suite of at least eight background data points representative of background conditions) for each respective COC at each respective compliance-testing monitoring point well. Where feasible, such concentration limits shall be of the intrawell type, but an interwell concentration limit can be proposed with substantiation. The proposed concentration limits for all COCs at a new compliance well shall be submitted together, as part of a regularly scheduled monitoring report, and shall become effective upon approval by the Water Board, but become subject to testing, at that new compliance well, during the subsequent reporting period. The report must be certified by a registered civil engineer or a certified engineering geologist.

Ordered by: Harold J. Singer Dated: Oct 14, 2010

HAROLD J. SINGER
EXECUTIVE OFFICER

Attachments:
A. Table A – Surface Impoundments LCRS Liquid Monitoring
B. Table B – Surface Impoundments Waste Monitoring
C. Table C – Paste Tailings Waste Monitoring
D. Groundwater Monitoring Points – NWTDF and Reclaim Pond
E. Groundwater Monitoring Points – Product Pond P-28
F. Table D – Groundwater Monitoring
G. General Provisions for Monitoring and Reporting

TABLE A

SURFACE IMPOUNDMENTS LCRS LIQUID MONITORING

Parameters	Units	Frequency
Field Parameter		
Flow Rate	gallons per day	Weekly (unless dry)
pH	Units	Quarterly (unless dry)
Specific Conductance	µmhos/cm	Quarterly (unless dry)
Monitoring Parameters		
Alkalinity Series (carbonate, bicarbonate, and hydroxide, and total)	mg/L	Once per Event
Chloride	mg/L	Once per Event
Nitrate (as Nitrogen)	mg/L	Once per Event
Sodium	mg/L	Once per Event
Strontium	mg/L	Once per Event
Sulfate	mg/L	Once per Event
Total Dissolved Solids	mg/L	Once per Event
Total Lanthanides	mg/L	Once per Event
Total Thorium	mg/L	Once per Event
Total Uranium	mg/L	Once per Event
Total Uranium	pCi/L (calculated)	Once per Event

An event is defined as an adverse condition – when flow rates detected in the LCRS are at or above the Rapid and Large Action Leakage Rates (Table 2 in MRP). Additional constituents of concern analyses may be required.

mg/L = Milligrams per liter
pCi/L = Pico curies per liter
µmhos/cm = Micromhos per centimeter

MOLYCORP MINERALS, LLC **ATTACHMENT B** **MONITORING AND REPORTING**
MOUNTAIN PASS MINE AND MILL **PROGRAM R6V-2010-0047**
San Bernardino County **TABLE B** **WDID NO. 6B362098001**

SURFACE IMPOUNDMENTS WASTE MONITORING

Parameters	Units	Frequency
Field Parameter		
Freeboard	feet and tenths	Weekly
pH	Units	Weekly
Specific Conductance	µmhos/cm	Weekly
Monitoring Parameters	**Wastewater – Solids Units**	
Arsenic	mg/L – mg/kg	Quarterly
Barium	mg/L – mg/kg	Quarterly
Calcium	mg/L	Quarterly
Chloride	mg/L	Quarterly
Fluoride	mg/L – mg/kg	Quarterly
Lead	mg/L	Quarterly
Magnesium	mg/L	Quarterly
Manganese	mg/L	Quarterly
Nitrate (as Nitrogen)	mg/L	Quarterly
Sodium	mg/L	Quarterly
Strontium	mg/L	Quarterly
Sulfate	mg/L	Quarterly
Total Alkalinity (as calcium carbonate)	mg/L	Quarterly
Total Dissolved Solids	mg/L	Quarterly
Total Thorium	mg/L – mg/kg[1]	Quarterly
Total Uranium	mg/L – mg/kg[2]	Quarterly
Total Uranium	PCi/L (calculated)	Quarterly
Other Constituents of Concern		
Antimony	mg/L – mg/kg	Every Five Years[3]
Beryllium	mg/L – mg/kg	Every Five Years[3]
Cadmium	mg/L – mg/kg	Every Five Years[3]
Chromium (VI)	mg/L – mg/kg	Every Five Years[3]
Cobalt	mg/L – mg/kg	Every Five Years[3]
Copper	mg/L – mg/kg	Every Five Years[3]
Mercury	mg/L – mg/kg	Every Five Years[3]
Molybdenum	mg/L – mg/kg	Every Five Years[3]
Nickel	mg/L – mg/kg	Every Five Years[3]
Selenium	mg/L – mg/kg	Every Five Years[3]
Silver	mg/L – mg/kg	Every Five Years[3]
Thallium	mg/L – mg/kg	Every Five Years[3]
Total Lanthanides	mg/L	Annually[3]
Vanadium	mg/L – mg/kg	Every Five Years[3]
Zinc	mg/L – mg/kg	Every Five Years[3]

[1] For mass analysis, use laboratory method with detection level of 0.001 mg/L for wastewater and groundwater samples. Higher detection levels are acceptable if the Discharger can demonstrate matric interference due to high TDS.

[2] The Discharger has demonstrated the correlation between isotopic laboratory analysis and mass analysis for uranium. For mass anlayses, use laboratory method with detection level of 0.001 mg/L for wastewater and groundwater samples. Higher detection levels are acceptable if the Discharger can demonstrate matric interference due to high TDS.

[3] Initial five-year sampling starts with initial wastewater discharge; initial sampling results reported no later than 60 days after sampling. Subsequent five-year sampling results must be reported no later than 120 days after sampling.

TABLE C
Paste Tailings Waste Monitoring

Parameters	Units	Frequency
Influent flow rate		
Tailings paste discharged	million gallons or tons/day	Monthly
Tailings amendment (% weight)	percent (%)	Monthly
Field Parameters		
Free Water	pass/fail	Monthly[1]
Paste consistency	inches	Quarterly
Solids percent by weight	percent (%)	Quarterly
Constituents of Concern		
Antimony	mg/kg	Quarterly
Arsenic	mg/kg	Quarterly
Barium	mg/kg	Quarterly
Beryllium	mg/kg	Quarterly
Cadmium	mg/kg	Quarterly
Chromium (VI)	mg/kg	Quarterly
Cobalt	mg/kg	Quarterly
Copper	mg/kg	Quarterly
Fluoride	mg/kg	Quarterly
Mercury	mg/kg	Quarterly
Molybdenum	mg/kg	Quarterly
Nickel	mg/kg	Quarterly
Selenium	mg/kg	Quarterly
Silver	mg/kg	Quarterly
Thallium	mg/kg	Quarterly
Vanadium	mg/kg	Quarterly
Zinc	mg/kg	Quarterly

Milligrams per kilogram (mg/kg)

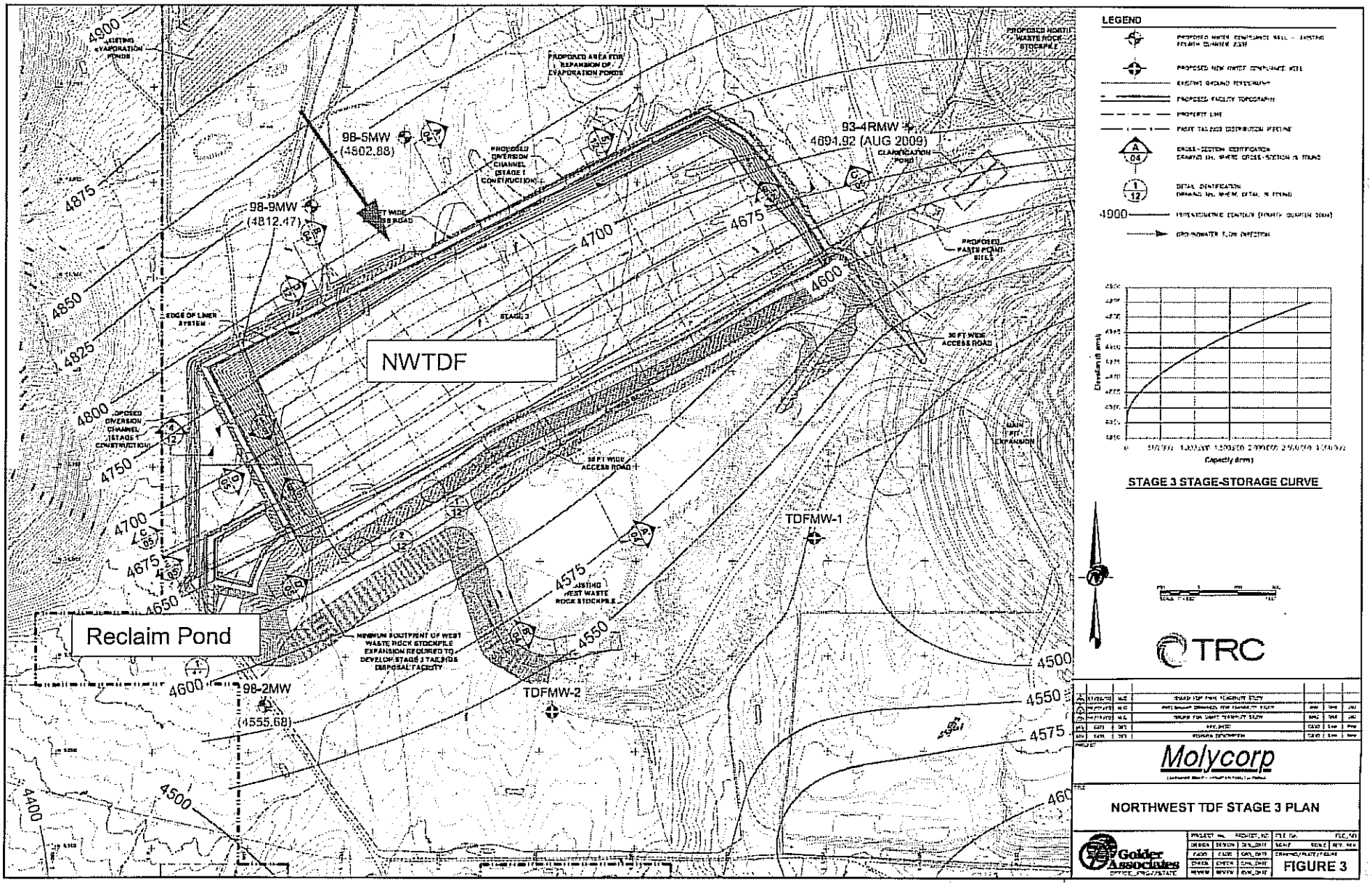
[1] Weekly testing during the initial 90 days of waste discharge, then monthly provided results indicate paste tailings consistently pass filter test.

Molycorp Minerals LLC
Mountain Pass Mine and Mill

ATTACHMENT D

Groundwater Monitoring Points - NWTDF and Reclaim Pond

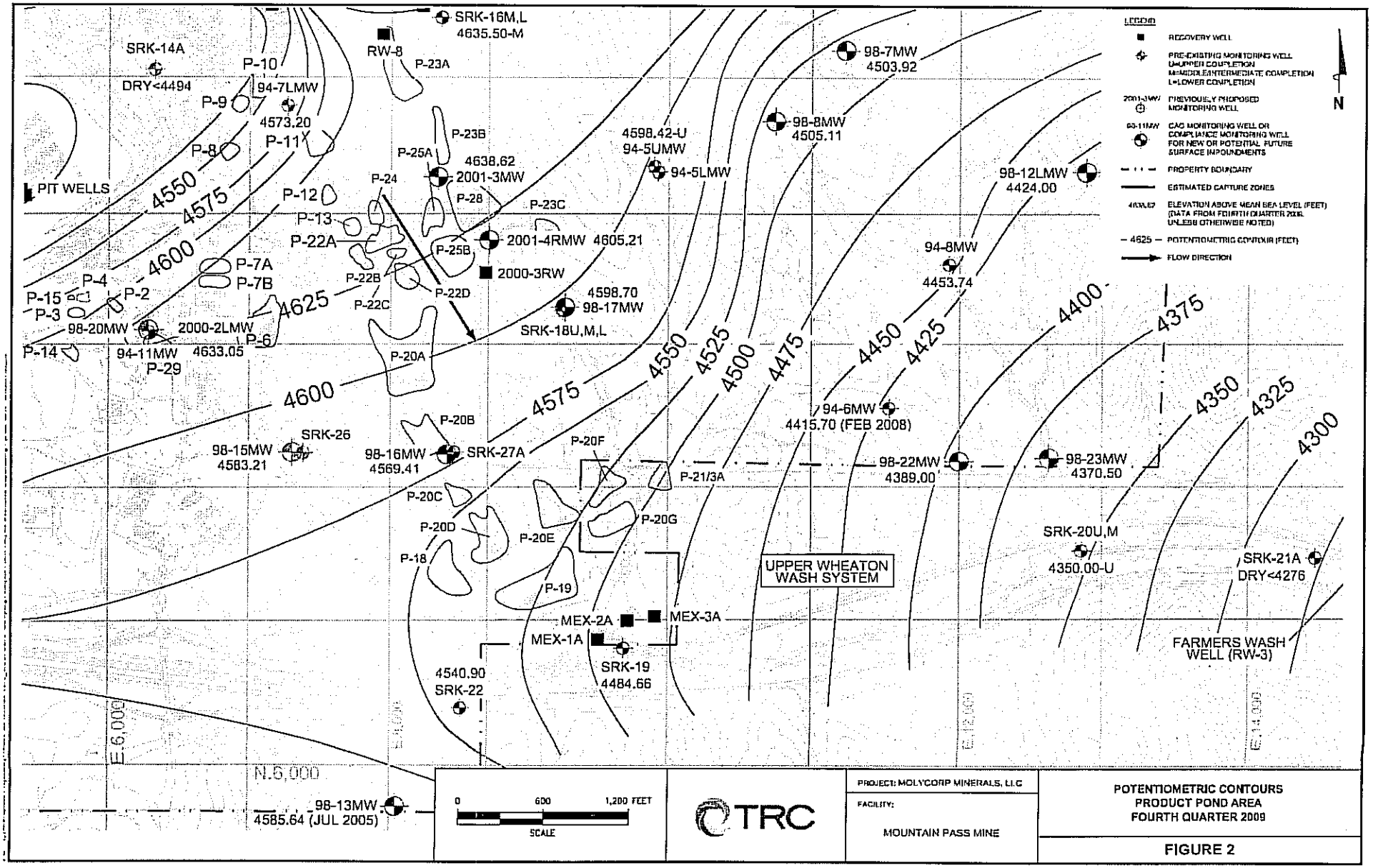
Monitoring and Reporting
Program R6V-2010-0047
WDID NO. 6B362098001



Molycorp Minerals LLC
Mountain Pass Mine and Mill

ATTACHMENT E
Groundwater Monitoring Points - Product Pond P-28

Monitoring and Reporting Program
R6V-2010-0047
WDID NO. 6B362098001



GROUNDWATER MONITORING

Parameters	Units	Frequency[1]
Field Parameters		
Groundwater Elevation	Feet and hundredths, (mean sea level datum)	Quarterly
Oxidation-Reduction Potential	millivolts	Quarterly
pH	Units	Quarterly
Specific Conductance	µmhos/cm	Quarterly
Temperature	Degrees Fahrenheit (°F) or Centigrade (°C)	Quarterly
Turbidity	NTUs	Quarterly
Monitoring Parameters		
Chloride	mg/L	Quarterly
Color	Color units	Quarterly
Gross Alpha	pCi/L	Quarterly
Gross Beta	pCi/L	Quarterly
Mercury	mg/L	Quarterly
Nitrate (as Nitrogen)	mg/L	Quarterly
Strontium	mg/L	Quarterly
Sulfate	mg/L	Quarterly
Total Alkalinity (as calcium carbonate)	mg/L	Quarterly
Total Dissolved Solids (TDS)	mg/L	Quarterly
Total Radium	pCi/L	Quarterly
Total Thorium	mg/L[2]	Quarterly
Total Uranium	mg/L	Quarterly
Total Uranium	pCi/L (calculated)[3]	Quarterly
Other Constituents of Concern		
Antimony	mg/L	Every Five Years[5]
Arsenic	mg/L	Every Five Years[5]
Barium	mg/L	Every Five Years[5]
Beryllium	mg/L	Every Five Years[5]
Cadmium	mg/L	Every Five Years[5]
Calcium	mg/L	Every Five Years[5]
Cerium	mg/L	Annually[4]
Chromium (VI)	mg/L	Every Five Years[5]
Cobalt	mg/L	Every Five Years[5]
Copper	mg/L	Every Five Years[5]
Fluoride	mg/L	Every Five Years[5]
Lead	mg/L	Annually[4]
Magnesium	mg/L	Every Five Years[5]
Manganese	mg/L	Every Five Years[5]
Molybdenum	mg/L	Every Five Years[5]
Nickel	mg/L	Every Five Years[5]
Selenium	mg/L	Every Five Years[5]

Continued on next page

TABLE D – GROUNDWATER MONITORING (continued)

Parameters	Units	Frequency[1]
Sodium	mg/L	Every Five Years[5]
Thallium	mg/L	Every Five Years[5]
Total Lanthanides	mg/L	Annually[4]
Vanadium	mg/L	Every Five Years[5]
Yitrium	mg/L	Annually[4]
Zinc	mg/L	Every Five Years[5]

[1] All constituents of concern must be sampled and analyzed quarterly for the first eight quarters after well installation.
[2] For mass analysis, use laboratory method with detection level of 0.001 mg/L for wastewater and groundwater samples. Higher detection levels are acceptable if the Discharger can demonstrate matric interference due to high TDS.
[3] The Discharger has demonstrated the correlation between isotopic laboratory analysis and mass analysis for uranium. For mass analysis, use laboratory method with detection level of 0.001 mg/L for wastewater and groundwater samples. Higher detection levels are acceptable if the Discharger can demonstrate matric interference due to high TDS.
[4] Five-year monitoring shall alternate between the highest and lowest groundwater elevation seasons when applicable.
[5] Added to the list of COCs sampled and analyzed from compliance monitoring wells for P-28.

mg/L = Milligrams per liter
NTUs = Nephelometric turbidity units
pCi/L = Pico curies per liter

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

GENERAL PROVISIONS
FOR MONITORING AND REPORTING

1. SAMPLING AND ANALYSIS

   a. All analyses shall be performed in accordance with the current edition(s) of the following documents:

      i. Standard Methods for the Examination of Water and Wastewater

      ii. Methods for Chemical Analysis of Water and Wastes, EPA

   b. All analyses shall be performed in a laboratory certified to perform such analyses by the California State Department of Health Services or a laboratory approved by the Regional Board Executive Officer. Specific methods of analysis must be identified on each laboratory report.

   c. Any modifications to the above methods to eliminate known interferences shall be reported with the sample results. The methods used shall also be reported. If methods other than EPA-approved methods or Standard Methods are used, the exact methodology must be submitted for review and must be approved by the Regional Board prior to use.

   d. The Discharger shall establish chain-of-custody procedures to insure that specific individuals are responsible for sample integrity from commencement of sample collection through delivery to an approved laboratory. Sample collection, storage, and analysis shall be conducted in accordance with an approved Sampling and Analysis Plan (SAP). The most recent version of the approved SAP shall be kept at the facility.

   e. The Discharger shall calibrate and perform maintenance procedures on all monitoring instruments and equipment to ensure accuracy of measurements, or shall insure that both activities will be conducted. The calibration of any wastewater flow measuring device shall be recorded and maintained in the permanent log book described in 2.b, below.

   f. A grab sample is defined as an individual sample collected in fewer than 15 minutes.

   g. A composite sample is defined as a combination of no fewer than eight individual samples obtained over the specified sampling period at equal intervals. The volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling. The sampling period shall equal the discharge period, or 24 hours, whichever period is shorter.

2. OPERATIONAL REQUIREMENTS

a. Sample Results

Pursuant to California Water Code Section 13267(b), the Discharger shall maintain all sampling and analytical results including: strip charts; date, exact place, and time of sampling; date analyses were performed; sample collector's name; analyst's name; analytical techniques used; and results of all analyses. Such records shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.

b. Operational Log

Pursuant to California Water Code Section 13267(b), an operation and maintenance log shall be maintained at the facility. All monitoring and reporting data shall be recorded in a permanent log book.

3. REPORTING

a. For every item where the requirements are not met, the Discharger shall submit a statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time, and shall submit a timetable for correction.

b. Pursuant to California Water Code Section 13267(b), all sampling and analytical results shall be made available to the Regional Board upon request. Results shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.

c. The Discharger shall provide a brief summary of any operational problems and maintenance activities to the Board with each monitoring report. Any modifications or additions to, or any major maintenance conducted on, or any major problems occurring to the wastewater conveyance system, treatment facilities, or disposal facilities shall be included in this summary.

d. Monitoring reports shall be signed by:

i. In the case of a corporation, by a principal executive officer at least of the level of vice-president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates;

ii. In the case of a partnership, by a general partner;

iii. In the case of a sole proprietorship, by the proprietor; or

iv. In the case of a municipal, state or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

e. Monitoring reports are to include the following:

i. Name and telephone number of individual who can answer questions about the report.

ii. The Monitoring and Reporting Program Number.

iii. WDID Number.

f. Modifications

This Monitoring and Reporting Program may be modified at the discretion of the Regional Board Executive Officer.

4. NONCOMPLIANCE

Under Section 13268 of the Water Code, any person failing or refusing to furnish technical or monitoring reports, or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars ($1,000) for each day of violation under Section 13268 of the Water Code.