

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

CLOSURE MONITORING AND REPORTING PROGRAM NO. R5-2003-0022
FOR

LASSEN GOLD MINING, INC.
HAYDEN HILL MINE

LASSEN COUNTY

The Discharger shall maintain water quality monitoring systems that are appropriate for detection monitoring that comply with the provisions of Title 27, California Code of Regulations, Division 2, Subdivision 1 (Title 27), Subchapter 3, Article 1.

Waste Discharge Requirements Order No. R5-2003-0022 orders compliance with this Monitoring and Reporting Program, and with the companion Standard Provisions and Reporting Requirements. Failure to comply with this Program, or with the Standard Provisions and Reporting Requirements, constitutes non-compliance with the WDRs and with the Water Code, which can result in the imposition of civil monetary liability.

REPORTING

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. Monitoring data shall be submitted for each station such that the data is reported on an individual and cumulative basis. The data shall be summarized in such a manner as to illustrate clearly the compliance with waste discharge requirements. Each monitoring report shall include an evaluation of groundwater flow directions including a groundwater contour map for the quarter, and a finding as to the status of compliance with waste discharge requirements.

Quarterly, and semi-annual monitoring results shall be submitted quarterly to the Regional Board by the **30th** day of the month following the calendar quarter. The results of any monitoring done more frequently than required at any location at this facility shall be reported to the Board. All historical monitoring data shall be updated and submitted in an electronic form acceptable to Regional Board staff with each quarterly monitoring report.

Semi-annual samples shall be obtained in the Spring and Fall of each year.

Recognizing that the site is remote and experiences heavy snowfall, if the Discharger is unable to access the site due to excessive snowfall during the winter period for the required monitoring, the Discharger shall so note on the monitoring report. The inability to access the site due to accumulated snow shall not be a violation of these Waste Discharge Requirements.

An annual report shall be submitted by **15 April** of each year. The annual report shall be a comprehensive document assessing compliance with waste discharge requirements and the water quality protection standard over the previous year. Trend analysis graphical plots and statistical comparisons with concentration limits shall be included in the annual report for naturally occurring detectable constituents of concern. Proposed updated background or baseline concentrations for naturally occurring detectable constituents of concern shall be included in the annual report.

REQUIRED MONITORING PROGRAMS

I. GENERAL FACILITY MONITORING

General facility monitoring shall be reported on an **annual** basis with the annual monitoring report and shall include the continuous measurement of precipitation and reporting of monthly precipitation and 24-hour precipitation for the most significant storm events of the period.

II. STANDARD OBSERVATIONS

Each monitoring report shall include a summary and certification of completion of all applicable Standard Observations for receiving waters, and along the perimeter and for the WMUs. The standard observations shall be performed on a quarterly basis and shall include the following.

1. Receiving Waters:
 - a. Discoloration and turbidity: description of color, source, and size of affected area.
 - b. Evidence of water uses: presence of water-associated wildlife.
 - c. Flow rate.
 - d. Weather conditions: wind direction and estimated velocity, total precipitation during recent days and on the day of the observation.
2. Along the Perimeter of Waste Management Unit
 - a. Evidence of liquid leaving or entering the Unit (i.e., runoff, run-on, seepage), estimated size of affected area, and flow rate (show affected area on map).
 - b. Evidence of erosion.
3. For the Waste Management Unit
 - a. Evidence of ponded water at any point on the waste management unit (show affected area on map).
 - b. Evidence of erosion.

III. TAILINGS IMPOUNDMENT (WMU #1) AND HEAP LEACH PAD (WMU#2) WATER QUALITY MONITORING

Effluent from the Tailings Impoundment and Heap Leach Pad shall be monitored **monthly** for the constituents listed in Table 1 the first year and **quarterly** thereafter, and **quarterly** for the constituents in Table 2 and 3. Monitoring stations at WMU #1 and WMU #2 shall include the following.

<u>Station</u>	<u>Description</u>	<u>Location</u>
Dosing Tanks	Effluent from the Tailings Impoundment and Heap Leach Pad	Inlet pipe to Dosing Tanks
Piezometers	Measure hydraulic head on the upper liner of the Tailings Impoundment ¹	Above the upper liner

¹Depth of liquid in the piezometers shall be measured and reported as “depth of liquid, in feet, on the upper liner”

IV. Drainfields Monitoring

The suction lysimeters under the drainfields shall be monitored **quarterly** for the constituents on Tables 1, 2, and 3 for the first year, and **semi-annually** thereafter. Monitoring stations at the tailings drainfield and the heap leach drainfield shall include the following:

<u>Station</u>	<u>Description</u>	<u>Location</u>
Lysimeter LT-S	Shallow Suction Lysimeter Under tailings drainfield	30’ below surface center of drainfield
Lysimeter LT-D	Deep Suction Lysimeter Under tailings drainfield	60’ below surface center of drainfield
Lysimeter LH-S	Shallow Suction Lysimeter Under tailings drainfield	25’ below surface center of drainfield
Lysimeter LH-D	Deep Suction Lysimeter Under tailings drainfield	60’ below surface center of drainfield
Lysimeter LB-S	Background Suction Lysimeter	30’ below surface

V 7-BENCH AND SOUTH ARD DISPOSAL SITE (WMU #8 AND 9)

Leachate from the 7-Bench and South Acid Rock Disposal Facilities shall be monitored **quarterly** for the constituents in Table 1, 2 and 3 for the first year and **semi-annually** thereafter. Monitoring stations at WMU #8 and 9 shall include the following.

<u>Station</u>	<u>Description</u>	<u>Location</u>
Discharge pipe from LCRS	Leachate from containment cell	Leachate pipe before co-mingled with any other source

VI. NORTH LOOKOUT PIT AND SOUTH LOOKOUT PIT WATER QUALITY MONITORING

Samples will be collected from the pool surface of the North Lookout Pit and South Lookout Pits on a **quarterly** basis for the constituents in Tables 1, 2, and 3 for the first year and **semi-annually** thereafter. If no ponded water is present, it shall be noted in the monitoring report.

<u>Station</u>	<u>Description</u>	<u>Location</u>
North Pit	Pool water	Surface of North pool
South Pit	Pool water	Surface of South pool

VII. GROUND WATER MONITORING

The following monitoring points shall constitute the ground water monitoring system for the facility. All wells shall be sampled on a **quarterly** basis for the first year for the constituents listed in Table 1 and **semi-annually** thereafter, and **semi-annually** for the constituents in Tables 2 and 3. The springs and seeps below the open pit shall be monitored annually in **September**. The Discharger shall determine at each sampling whether there is a statistically significant increase over water quality protection standards for each parameter and constituent analyzed. Specific wells and the zone which they monitor are listed below.

<u>Area Monitored</u>	<u>Well Identification No.</u>
Perched Groundwater beneath WMUs Nos. 1 & 2	Wells M89-5, M90-8, M92-15, M92-17
Deep Groundwater beneath WMUs Nos. 1 & 2	Wells M92-16, M94-3
Perched Groundwater near 7-Bench Acid Rock Disposal Facility	Well M94-19
Perched Groundwater adjacent to Lookout Pit	Wells M01-2, M01-3, M01-4
Perched Groundwater below North Waste Rock Dump	Well M90-9
Springs and seeps below Open Pit	Seep Numbers 10, 22, 23, 24, 25, 26, 27, 28, 29, 30, 36

VII. SURFACE WATER MONITORING

Flow data from the surface water discharge points shall be monitored quarterly for the constituents in Table 4. Surface water monitoring shall be performed at the following stations:

<u>Station</u>	<u>Location</u>
Discharge 001	Preston Canyon
Discharge 002	Drainage to Silva Flat Reservoir
Discharge 003	Drainage Ditch From Lookout Pit

WATER QUALITY PROTECTION STANDARD

A Water Quality Protection Standard Report shall be submitted to the Board staff for approval by **1 June 2003**. The Water Quality Protection Standard for surface and ground water shall, as defined in §20390 of Title 27, shall consist of constituents of concern, their concentration limits, the points of compliance, and all water quality monitoring points.

Constituents of concern shall include all waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the waste management units (WMUs). Concentration limits shall consist of background or baseline concentrations of each constituent of concern in each medium. For each reporting period, the Discharger shall determine whether there is statistically significant evidence of a release from WMUs and whether the WMUs are in compliance with the Water Quality Protection Standard using procedures specified in §20415 of Title 27.

SAMPLING AND ANALYSIS PLAN

A Sampling and Analysis Plan must be submitted to Board staff for approval by **1 May 2003**. The Sampling and Analysis Plan shall be maintained for all compliance monitoring activities and shall include specific methods for demonstrating compliance with the water quality protection standard and information on sample collection, handling, chain of custody control, analytical procedures, and field and laboratory quality assurance and quality control.

The Discharger shall implement the above monitoring program on the effective date of this Order.

Ordered By: _____
THOMAS R. PINKOS, Executive Officer

_____ 31 January 2003
Date

Table 1

Constituents	Units	Type of Sample
Flow rate	gpm	Measured
Cumulative Volume ¹	gallons	Measured
Static Water Level	Feet MSL	Measured (Wells)
Temperature	°C	Measured
pH (field)	number	Measured
EC	µmhos	Grab
Lab pH	number	Grab
TDS	mg/l	Grab

Table 2

Constituents	Units	Type of Sample
Chloride	mg/l	Grab
Sulfate	mg/l	Grab
Nitrate	mg/l	Grab
Free Cyanide	mg/l	Grab
WAD Cyanide	mg/l	Grab
Total Cyanide	mg/l	Grab
Bicarbonate Alkalinity	mg/l	Grab
Total Alkalinity	mg/l	Grab
Iron	mg/l	Grab
Sodium	mg/l	Grab
Magnesium	mg/l	Grab
Calcium	mg/l	Grab
Potassium	mg/l	Grab

Table 3

Constituent	Units	Type of Sample
Antimony	mg/l	Grab
Arsenic ³	mg/l	Grab
Cadmium	mg/l	Grab
Chromium (Total) ²	mg/l	Grab
Copper ²	mg/l	Grab
Lead	mg/l	Grab
Mercury	mg/l	Grab
Nickel	mg/l	Grab
Selenium ³	mg/l	Grab
Zinc ²	mg/l	Grab

Table 4

Constituents	Units	Type of Sample
Flow rate	Gpm	Field Measured
Temperature	°C	Measured
pH (field)	number	Measured
Electrical Conductivity	µmhos	Grab
TDS	mg/l	Grab
Suspended Solids	mg/l	Grab
Turbidity	NTU	Grab

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2003-0022

CLOSURE WASTE DISCHARGE REQUIREMENTS
FOR

LASSEN GOLD MINING, INC
HAYDEN HILL MINE

LASSEN COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Board) finds that:

1. The Hayden Hill Mine is owned and operated by Lassen Gold Mining, Inc, a subsidiary of Kinam Gold Inc. The facility was regulated by Order No. 94-206 (modified by Special Order No. 95-211) which addressed the excavation, processing, and disposal of mined material and wastes. The facility operated between 1992 and 2002. Ore extraction from the open pits ceased in 1997 and heap leach operations ceased in 2002.
2. The Hayden Hill Mine is in northern Lassen County, approximately 54 miles from Susanville and 4 miles west of Highway 139. The site boundary includes portions or all of Sections 1, 2, and 3, T36N, R9E; Sections 5 and 6, T36N, R10E; Sections 13, 24, 25, 34, 35, and 36, T37N, R9E; and Sections 29, 30, 31, and 32, T37N, R10E, MDB&M, and comprises approximately 1,186 acres, as shown on Attachment "A" which is incorporated herein and made part of this Order.
3. Surface drainage is to Silva Flat Reservoir which drains to Juniper Creek and Cayeote Creek, and Willow Creek, tributaries to the Pit River.
4. The Discharger has submitted the following reports and plans in support of their closure: Hayden Hill Mine Results of Investigation to Evaluate Potential For Drainfields, March 2002; Hayden Hill Mine, Integrated Reclamation and Closure Plan for the 7-Bench Facility and the Heap Leach Pad, March 2002; Hayden Hill Mine, Reclamation and Closure Plan for the Tailing Facility, May 2002; Hayden Hill Mine, Updated Site-Wide Groundwater Monitoring Plan, dated May 2002.
5. The Discharger has requested a revision of their waste discharge requirements to include an engineered alternative for closure of the tailings impoundment and heap leach pad.

SITE DESCRIPTION

6. The Hayden Hill Mine is within an area of low volcanic hills along the western margin of the Modoc Plateau physiographic province. This area is bounded by the Cascade Range to the west, the Sierra Nevada to the south, and the Basin and Range region to the east. The project site elevation ranges from 4,700 to 6,300 feet. The climate in the Hayden Hill area is moderate with summer temperatures reaching 90°F and winter temperatures falling to as low as -30°F.
7. The Modoc Plateau province is a volcanic region dominated by middle-to-late Miocene, intermediate-to-silicic lavas, ash flow tuffs, volcanic breccia, and volcanoclastic sedimentary rocks. Formations underlying the WMUs consist of a complex succession of intercalated pyroclastic flows, lavas, and epiclastic rocks. The predominate formations, from the oldest to youngest, include the Red Hill Pyroclastics, Letter Box Canyon Member of the Smith Flat Sequence, and the Preston Canyon Tuff. Thicknesses of the formations vary due to faulting and erosion. Permeabilities of the formations underlying the site have been measured during ground water exploration activities and range from 5×10^{-3} cm/sec in a thin, shallow sequence of paleogravels underlying the Preston Canyon Tuff to 3×10^{-8} cm/sec in the Letter Box Canyon Member.
8. Ground water beneath the site is found in two water-bearing zones: a relatively shallow, discontinuous perched water table at an elevation of approximately 5,470 to 5,490 feet above sea level (100 to 200 feet beneath the WMUs); and a deeper water-bearing zone at an elevation ranging between 5,250 to 4,900 feet above sea level (440 to 600 feet below the WMUs). The shallowest perched zone pinches out to the east, is locally recharged and is of limited supply. The deep system is strongly compartmentalized due to lithologic variations between rock types and the presence of high angle faults. Hydrothermal alteration and the associated clay mineral development tends to limit ground water flow. Ground water chemistry beneath and adjacent to the site indicate the chemistry is quite variable, possibly due to several factors including proximity to areas of intense hydrothermal alteration, structural isolation of ground water-bearing zones controlled by faulting, and seasonality.

OPERATION OF FACILITIES

9. The Discharger conducted mining operations for the recovery of gold and silver at the Hayden Hill Mine. Ore was obtained from an open pit with two primary ore zones identified as the Lookout Zone and the Providence Zone. Approximately 29 million tons of waste rock consisting of non-mineralized and slightly mineralized material overlying and interspersed with the ore is deposited in terraces on the north slope of Hayden Hill. Ore is transported to a nearby crushing facility for initial processing and sorting. Approximately 950,000 tone tailings reside in the tailings impoundment and 29 million

tons of leached ore remain on the heap leach pad. Facility locations are identified in Attachment "B" which is incorporated herein and made a part of this Order.

10. Mill grade material was further reduced in size and the mineral values recovered with carbon-in-pulp techniques using cyanide as an extracting agent. The ore was leached in a series of aboveground steel tanks. Cyanide concentrations were chemically reduced and the mill tailings discharged to the tailings impoundment where liquids were decanted into the process water pond. All liquid from the mill circuit was contained and recycled back into the recovery process.
11. Leach grade ore was stacked on the lined heap leach pads where a dilute solution of sodium cyanide was applied to the ore with spray emitters and drip lines. The gold- and silver-laden pregnant solution was conveyed to the pregnant solution pond. The pregnant solutions were pumped to the processing area and the mineral values recovered. The resulting solution, stripped of its mineral values, was conveyed to the barren solution pond where it was recycled back into the process.
12. All leach pads, conveyance structures, and processing facilities where cyanide or other chemical compounds were used in the extraction of mineral values were constructed to fully contain all solutions which may impact water quality. No process solutions were discharged to surface or ground water.

WASTE AND SITE CLASSIFICATION

Waste Rock Disposal Areas

13. Waste rock, including overburden and non-reactive sub-economic ore was side cast primarily on the north side of Hayden Hill and in small deposits over the site. The Main, Providence, and East Waste Rock Dumps are approximately 209, 58 and 64 acres in size, respectively.
14. Section 22480 (b.3.) of Title 27, California Code of Regulations (Title 27), defines Group C mining wastes as wastes from which any discharge would be in compliance with the applicable water quality control plan, including water quality objectives other than turbidity. Based upon these criteria, the waste rock is classified as a Group C mining waste.

Tailings Facility (WMU No. 1)

15. Tailings from the carbon-in-pulp circuit were chemically treated to reduce the concentration of free cyanide prior to discharge to the impoundment. The tailings impoundment covers approximately 102 acres. Tailings were placed in the impoundment with all liquid decanted to the lower end. Free liquids contained in the leached tailings

drain freely, allowing the solids to dewater. Highway drains placed above the outer liner promote drainage and consolidation of the tails. The outer portion of the impoundment is underlain by a high density polyethylene (HDPE) liner with a minimum thickness of 40 mils. Liquid from the deposited tailings flows to the lower portion of the impoundment which is underlain by a 60-mil HDPE liner and leachate collection system.

16. Pore water draining from the Tailings Facility and drainage from the Tailings Facility LCRS has a pH of approximately 5.3 and a TDS of approximately 3,800 mg/l. Section 22480 (b.2.) of Title 27 defines Group B mining wastes as wastes that consist of or contain nonhazardous soluble pollutants of concentrations which exceed water quality objectives for, or could cause, degradation of waters of the state. Based upon these criteria, the Tailings Impoundment is classified as Group B Waste Management Unit.

Heap Leach Pad (WMU No. 2)

17. The Heap Leach Pad (WMU No. 2) is lined with a 80 mil HDPE synthetic liner and a compacted clay liner with a maximum hydraulic conductivity of 1×10^{-6} cm/sec. The Heap Leach Pad contains 30 million tons of leached ore processed by cyanide heap leach and covers approximately 130 acres. The ore also contains some unoxidized rock that is capable of generating acid rock drainage (ARD).
18. Drainage from the Heap Leach Pads has a pH of approximately 7.1 and a TDS of approximately 4,000 mg/l. The Heap Leach Pad has been classified as a Group B Waste Management Unit.

Surface Impoundments (WMUs Nos. 3, 4, 5, and 6)

19. WMU Nos. 3, 4, 5, and 6 are surface impoundments ranging from 2 to 5 acres in area. WMU No. 3 receives decant solution from the tailings impoundment as described in Finding No. 16 above. WMU No. 4 received barren (mineral values were removed) solution from the mineral recovery process for recycling back onto the Heap Leach Pad. WMU No. 5 received pregnant (cyanide solution containing mineral values) from the Heap Leach Pad, and WMU No. 6 provided storm water capacity for containing process solutions during high rainfall periods. Design of these impoundments followed an engineering alternative approved by the Board. The design contains an inner and outer synthetic liners with a minimum thickness of 60 mils with a LCRS in between the liners. All synthetic liners are comprised of HDPE.
20. Due to the cyanide and TDS concentrations in the solutions contained within these impoundments, they are classified as Group B Waste Management Units.

**7-Bench and South Acid Rock Disposal Facility
(Waste Management Units Nos. 8 and 9)**

21. Samples of the ore and waste rock were analyzed for the potential to generate ARD. Chemical analyses of the waste rock indicate that portions have the potential to generate ARD. This material was classified as a Group B waste and was placed in WMUs Nos. 8 and 9.
22. WMU No. 8 (7-Bench Acid Rock Disposal Facility) is on the south-east side of Hayden Hill. WMU No. 9 (South Acid Rock Disposal Facility) is immediately east of the Heap Leach Pad. WMU No. 8 and 9 each cover approximately 14 acres. The bottom liners are comprised of a two-foot thick clay bottom liner with a maximum hydraulic conductivity of 1×10^{-6} cm/sec. The liners are overlain by a leachate collection and removal system which discharge to a lined leachate ponds.

LOOKOUT PIT

23. The open pits include the Lookout and Providence Pits on the top of Hayden Hill, approximately 800 feet above the regional ground water table and receive runoff from the immediate pit sidewalls only.

Sidewall runoff and low permeability rock in the base of the excavations resulted in two pit lakes. Exposed reactive rock in the side walls of the Lookout Pit lowered the pH of the lakes to a range of 3.6 to 3.9. The Discharger backfilled the pit lakes and captured surface water drainage from the non-reactive sidewalls, routing this drainage out of the pit. Any water ponded within the open pit will occur in the winter and spring, will be minimal in volume, and will not be discharged. The Lookout Pit is not considered a Waste Management Units at this time; however, if over time, the pit drainage water forms permanent lakes, shows evidence of significantly low pH and/or elevated metals or Total Dissolved Solids, it may be reclassified to a Group B Waste Management Unit and containment and/or treatment may be necessary pursuant to Title 27.

SURFACE AND GROUNDWATER CONDITIONS

25. The Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin, Fourth Edition (hereafter Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.
26. The beneficial uses of the Silva Flat Reservoir, Willow Creek, Juniper Creek, and the Pit River are municipal, industrial, and agricultural supply; recreation; esthetic enjoyment; navigation; ground water recharge; freshwater replenishment; hydroelectric power

generation; and preservation and enhancement of fish, wildlife, and other aquatic resources.

27. The beneficial uses of the ground water are municipal, industrial, domestic, and agricultural supply.

SURFACE WATER MONITORING

28. Surface water drainage from the waste rock dump on the north side of Hayden Hill is to Preston Canyon which is tributary to Willow Creek. Vegetation and benching of the waste rock dump has substantially reduced the sediment transported into Preston Canyon. A flow weir is in place and monitored for volume and water quality.
29. Surface water drainage from the Hayden Hill Access Road is to a tributary to Willow Creek. Historically, this road contributed significant sediment to Willow Creek. Stabilization efforts and reduced use of the road due to closing of the mine has substantially reduced sediment loading to the watercourse.
30. Surface water runoff from the Tailings Impoundment, Heap Leach Pad, former Administration buildings, mill and other ancillary facility locations is to Silva Flat Reservoir to the south. Compliance with the Reclamation Plans for the site, including stabilization and vegetation of exposed soils and disturbed areas will substantially reduce the potential for the transport of sediment from the site.

GROUNDWATER MONITORING

31. Ground water monitoring at the site has only shown impacts to minor amounts of perched ground water near the 7-Bench Acid Rock Disposal facility. This water is approximately 800 feet above the regional aquifer and is of limited extent. Monitoring has not indicated any impacts from the mining operations. Monitoring wells M05, M08, M15, and M17 monitor the perched ground water found approximately 50 to 200 feet beneath the Tailings Impoundment and Heap Leach Pad. Monitoring wells M16 and M03b monitor the deep, regional aquifer. Suction lysimeters beneath the heap leach and tailings Impoundment have not had sufficient moisture to provide a sample. Lysimeters will be placed beneath the drainfields to monitor the Vadose Zone for potential impacts well before moisture reaches ground water.

FACILITY CLOSURE

Non-Acid Generating Waste Rock Dump

32. The waste rock dumps containing non-reactive material shall be graded and vegetation established to reduce erosion and sediment transport. Runoff from the waste rock and any surfacing seepage shall be sampled during the post-closure period to assure the absence of ARD.

Acid Generating Waste Disposal Areas

33. Waste Management Units which received potentially acid generating waste rock (WMU Nos. 8 and 9) shall be closed as landfills with final covers pursuant to Section 21400 (a) and (b)(1). Leachate from WMUs Nos. 8 and 9 shall be piped to the heap leach pad and disposed to drainfields.

Tailings Impoundment and Heap Leach

34. The Discharger has determined, based on experience gained at other heap leach operations in Nevada and other areas, that rinsing both the tailings and leached residue on the heap leach pad sufficiently to obtain in Group C classification is impractical, if not impossible, due to 1) the difficulties of removing the soluble waste constituents from the pore spaces in the low permeability tailings and large volume of the heap leach and 2) due to the presence of unoxidized sulfide ore in each WMU, rinsing out the entrained alkalinity would be counter productive and may result in the production of ARD
35. Section 20080 (b) of Title 27 allows engineered alternatives to construction or prescriptive standards where the Discharger demonstrates: "(1) The construction of prescriptive standard is not feasible as provided in Subsection c of this section; (2) There is a specific engineered alternative that: (a) is consistent with the performance goal addressed by the particular construction or prescriptive standard, and (b) provides equivalent protection against water quality impairment."
36. Section 20080 (c) of Title 27 requires that "To establish that compliance with prescriptive standards in this subdivision is not feasible for the purposes of 20080 (b), the discharger shall demonstrate that compliance with a prescriptive standard either: (1) is unreasonably and unnecessarily burdensome and will cost substantially more than alternatives which meet the criteria in 20080 (b); or (2) is impractical and will not promote attainment of applicable performance standards. The RWQCB shall consider all relevant technical and economic factors including, but not limited to, present and projected costs of compliance, potential costs for remedial action in the event that waste or leachate is released to the environment, and the extent to which ground water resources could be affected.

37. Section 22510 (a) requires that mining waste management units “be closed so that they no longer pose a threat to water quality. No post closure land uses shall be permitted that might impair the integrity of containment structures”.
38. The Discharger has demonstrated that to cover the Tailings Impoundment (102 acres) and the Heap Leach Pad (130 acres) with a low permeability material is impractical and will not, in the long term, be protective of water quality. The waste contained within the WMUs will pose a threat to water quality for an exceptionally long period of time (hundreds or thousands of years) unless it is allowed to geochemically stabilize. A low permeability cover would restrict geochemical stabilization by limiting moisture and oxygen entering the waste pile. While this would reduce the potential for discharges and geochemical reactions, the low permeability covers would have to be maintained “forever”, requiring the long term presence of personnel and financial assurances. An earthen material for the low permeability cover would be highly susceptible to damage from freeze-thaw cycles and desiccation and would lose its effectiveness in a few years, requiring constant repair. A synthetic liner may have a longer period of maintaining its integrity, but in a hundred years or so, it too may be susceptible to failure. It would be in the best interest of the state to have any geochemical reactions, attenuation, and/or discharges to occur over the near term when a viable discharger and regulatory personnel familiar with the site are available.
39. The Discharger has proposed to cover both WMUs with vegetative material to reduce erosion. Precipitation that infiltrates into the WMU will eventually be collected on the bottom synthetic liners and be collected, monitored, and discharged. The Discharger proposes to direct the discharge from each WMU to subsurface drainfields where it will be allowed to infiltrate. Data obtained using liquid from each WMU and on-site soils has shown most of the TDS and soluble waste constituents contained within the drainage will be fully attenuated in the subsurface before it reaches the water table, approximately 600 feet below the site. The document titled Hayden Hill Mine Results of Investigation to Evaluate Potential For Drainfields, March 2002, submitted by the Discharger concludes there will be no impacts on ground water quality. The unsaturated zone and ground water monitoring system proposed by the Discharger will be sufficient to assure the protection of surface and ground water quality.

Surface Impoundment Closure

40. At closure of the surface impoundments (WMUs Nos. 3, 4, 5, and 6), all residual wastes, including liquids, sludges, precipitates, settled solids, and adjacent natural geologic materials contaminated by wastes, shall be completely removed and discharged to a disposal facility approved by the Executive Officer. The synthetic liners will be folded and left in place if approved by the Executive Officer. If, after reasonable attempts to remove contaminated natural geologic materials, the Discharger demonstrates that removal of all remaining contamination is infeasible, the impoundment shall be closed as a landfill pursuant to Title 27

General Site Closure

41. All facilities including the administration building, mill, processing and beneficiation plant, heavy equipment maintenance shop, ore crusher and conveyer, fuel storage area, access and haul roads, and associated infrastructure, will be dismantled and removed from the site. Concrete foundations will remain in place, be cleaned, and covered with a minimum 2 feet of overburden material.
42. The remainder of the site area including the access roads, haul roads, the disturbed areas adjacent to the pits, the WMUs and the plant area will generally be reclaimed while certain access roads will be left in place for potential future long-term use.
43. Mine revegetation and habitat restoration are identified in the site reclamation plans approved by Lassen County and the Department of Conservation pursuant to the Surface Mining and Reclamation Act. They include soil stabilization and revegetation of all disturbed areas and a monitoring period to assure the success of the reclamation efforts.

Postclosure Land Use

44. The reclaimed mine site will be suitable for wildlife habitat and range land.
45. Access roads to key points within the main site area will remain.
46. Deed restrictions will be attached to the property to prevent unacceptable land uses and to assure the integrity of the Tailings Impoundment and Heap Leach Pad.

CEQA AND OTHER CONSIDERATIONS

47. The action to revise waste discharge requirements for this facility is exempt from the provisions of the California Environmental Quality Act, (Public Resources Code Section 21000, et seq.), in accordance with Section 15301, Title 14, California Code of Regulations.
48. The Lassen County Planning Commission approved Mitigated Negative Declarations on 15 July 2002 for the Integrated Reclamation and Closure Plan for the 7-Bench Facility and Heap Leach Pad closure (Resolution No. 07-04-02), and on 7 August 2002 for the Reclamation and Closure Plan for the Tailing Facility (Resolution No. 08-05-02) in accordance with CEQA.
49. Compliance with these waste discharge requirements, including implementation of the monitoring and reporting program, will mitigate or avoid significant impacts on water quality.

50. This order implements:
- a. The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition; and
 - b. The prescriptive standards and performance goals of Chapters 1 through 7, Subdivision 1, Division 2, Title 27, of the California Code of Regulations, effective 18 July 1997, and subsequent revisions.

PROCEDURAL REQUIREMENTS

51. All local agencies with jurisdiction to regulate land use, solid waste disposal, air pollution, and to protect public health have approved the use of this site for the discharges of waste to land stated herein.
52. The Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
53. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.
54. Any person adversely affected by this action of the Board may petition the State Water Resources Control Board to review the action. The petition must be received by the State Board within 30 days of the date of issuance of this Order. Copies of the law and regulations applicable to filing the petition will be provided on request.

IT IS HEREBY ORDERED, pursuant to Sections 13263 and 13267 of the California Water Code, that Orders No. 94-206 and 95-211 be rescinded, and that Lassen Gold Mining, Inc., its agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted there under, shall comply with the following:

A. PROHIBITIONS

1. The discharge of or deposit of waste at this site from sources other than the Tailings Impoundment, Heap Leach Pad, 7-Bench Acid Rock Disposal Site, and the South Acid Rock Disposal Site, is prohibited.
2. The discharge of waste to ground water, surface water, or surface water drainage courses is prohibited except as specified by this Order.

B. DISCHARGE SPECIFICATIONS

1. The treatment or disposal of waste shall not cause pollution or a nuisance as defined in the California Water Code, Section 13050.
2. The discharge of wastes shall not cause water quality degradation by allowing a statistically significant increase over background or baseline concentrations.
3. Waste materials shall be confined to the waste management units designated for that waste as shown on Attachment B except as specified by this Order.
4. There shall be no permanent ponding of any liquid on top of the Tailings Impoundment at any time.
5. Any water that has contacted the wastes contained in any WMU shall be collected and discharged to the drainfields.
6. Surface water drainage from the surrounding area and surface water drainage from the top of the closed WMUs shall be diverted from the drainfields and other WMUs.
7. Annually, prior to the anticipated rainy season but no later than **15 October**, any necessary erosion control measures shall be implemented, and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent erosion or flooding of the facility and to prevent surface drainage from contacting or percolating through wastes. Any erosion control work completed at the site shall be discussed in the Annual Monitoring Summary Report.
8. Liquid collected in a LCRS shall be measured, sampled and returned to the waste management unit that it came from or otherwise managed in accordance with Board approved methods as described in these waste discharge requirements.
9. Measures shall be taken to assure that unauthorized persons and vehicles are effectively excluded from WMU 1, 2, 8 and 9.

C. WASTE MANAGEMENT UNIT CONSTRUCTION

1. Measures shall be taken to ensure that synthetic liners are not punctured for the period during which the waste material contained therein poses a threat to water quality.

Supervision and Certification of Construction

2. All WMUs and disposal systems shall be designed and constructed under the direct supervision of a California registered Civil Engineer or a Certified Engineering

Geologist and shall be certified by that individual as meeting the prescriptive standards and performance goals of Title 27 prior to waste discharge.

Protection from Storm Events

3. All WMUs shall be maintained to prevent, to the greatest extent possible, erosion, slope failure, washout, and overtopping under, at a minimum, 100-year wet season precipitation conditions.
4. The drainfields shall be designed and maintained to contain, at a minimum, the 100-year wet season precipitation without flooding and discharging to surface water drainage courses .
5. Precipitation and drainage control systems shall be designed and constructed to accommodate the anticipated volume of precipitation and peak flows from surface runoff under, at a minimum, 100-year, 24-hour precipitation conditions.
6. The Discharger shall notify the Board within 24 hours of any flooding, equipment failure, slope failure, or other change in site conditions which could impair the integrity of waste containment facilities or of precipitation and drainage control structures.
7. Drainage from the Heap Leach Pad shall not exceed the average annual discharge rate of 35 gpm or the peak discharge rate of 50 gpm. Drainage from the Tailings Impoundment shall not exceed the average annual discharge rate of 15 gpm or the peak discharge rate of 20 gpm. If these rates are exceeded, the Discharger shall notify the Board within 30 days and submit a report demonstrating the high flows have not damaged the drainfield or associated collection and discharge structures, resulted in a discharge to surface water drainage courses, otherwise reduce the effectiveness of the drainfield in the distribution and attenuation of the discharge. If the drainfields have been damaged, or a discharge to surface water has occurred, the Discharger shall take immediate measures to prevent further discharges to surface water drainage courses and within 60 days shall submit a plan for approval by the Executive Officer describing what actions they plan to take to reduce the maximum flows to the drainfields. The actions must be implemented over the next summer period.

D. CLOSURE SPECIFICATIONS

General Waste Management Unit Closure

1. WMUs shall be closed according to an approved closure and post-closure maintenance plan which implements §22510 of Title 27.

2. The closure and post-closure maintenance plan shall provide for continued compliance with the applicable standards of Title 27 for waste containment, precipitation and drainage controls, and monitoring throughout closure and the post-closure maintenance period.
3. Closure of each WMU shall be under the direct supervision of a California registered Civil Engineer or a Certified Engineering Geologist and shall be certified by that individual as meeting the prescriptive standards and performance goals of Title 27.
4. Closed WMUs shall be provided with at least two permanent monuments, installed by a licensed land surveyor, from which the location and elevation of all wastes, containment structures, drainfields, discharge structures and monitoring facilities can be determined throughout the post-closure maintenance period.
5. Closed WMUs which require caps shall be graded as described in these WDRs and maintained to prevent ponding and promote revegetation.
6. Closed areas with slopes greater than 10%, surface drainage courses, and areas subject to erosion by wind or water shall be designed and constructed to prevent erosion.
7. During closure and post-closure maintenance , the following shall be complied with:
(a) erosion control and surface flow containment facilities shall be constructed and maintained to prevent siltation of surface waters; (b) all exposed cuts and fills shall be compacted, and reseeded as soon as practicable, (c) disturbed areas of roadway shall be water barred as necessary and drained onto undisturbed areas with erosion control; (d) there shall be no removal of vegetation nor disturbance of natural soil conditions except where measures that will prevent erosion discharge to surface waters or storm drainage systems are installed and operational prior to 15 October annually or where measures are installed and operational prior to the removal or disturbance; and (e) the Discharger shall submit for approval by 15 October annually, an erosion control plan and the annual mining reclamation report pursuant to SMARA regulations.
8. Within one year of adoption of these Waste Discharge Requirements, the Discharger shall provide proof to the Board that the deed to the facility property, or some other instrument that is normally examined during title search, has been modified to include, in perpetuity, a notation to any potential purchaser of the property stating that: (1) the parcel contains disposal sites (WMU Nos. 1, 2, 8, and 9) which contain Group B mining wastes, including wastes capable of discharging elevated TDS and/or with the potential to generate acid; (2) the parcel contains drainfields utilized to dispose of drainage from the WMUs, (3) land use options for the parcel are restricted in accordance with the post-closure land uses set forth in the post-closure plan; and (4) in the event that the Discharger defaults on carrying out either the post-closure

maintenance plan or any corrective action needed to address a release, then the responsibility for carrying out such work falls to the property owner.

SURFACE IMPOUNDMENT CLOSURE

9. At closure of the surface impoundments, all residual wastes, including liquids, sludges, precipitates, settled solids, liner materials, and adjacent natural geologic materials contaminated by wastes, shall be completely removed and discharged to a disposal facility approved by the Executive Officer. If, after reasonable attempts to remove contaminated natural geologic materials, the Discharger demonstrates that removal of all remaining contamination is infeasible, the impoundment shall be closed as a landfill pursuant to Section 21400 (a) and (b)(1) of Title 27.

WASTE ROCK CLOSURE

Non-Acid Generating Waste Rock Dump

10. The waste rock dump shall be graded and vegetation established to reduce erosion and sediment transport. Runoff from the waste pile and any surfacing seepage shall be sampled during the post-closure period to assure the absence of ARD.

Acid Generating Waste Disposal Areas

11. Waste Management Units which received potentially acid generating waste rock (WMU Nos. 8, and 9) shall receive a final cover which is designed and constructed to function with a minimum of maintenance and consists, at a minimum, of a two-foot-thick foundation layer which may contain waste materials, overlain by a two-foot-thick clay layer with a maximum permeability of 1×10^{-6} cm/sec, and finally by a one-foot-thick vegetative soil layer.

Tailings Impoundment

12. The Tailings Impoundment shall be graded to drain precipitation and covered with a vegetative layer to prevent erosion. The bottom synthetic liner shall not be penetrated. Drainage from the tailings impoundment shall be collected, monitoring pursuant to Monitoring and Reporting Program No. R5-2003-0022, and discharged to a subsurface drainfield.

Heap Leach Pad

13. The slopes of the leached material on the Heap Leach Pad shall be graded to a minimum 2.5:1 slope and the top graded to drain precipitation. The leached residue shall be covered with a vegetative layer. Erosion control structures shall be installed

as necessary to prevent erosion of the vegetative layer. The underlying synthetic liners shall not be penetrated. All liquid collected on the heap leach pad shall be monitored pursuant to Monitoring and Reporting Program No. R5-2003-0022 and discharged to the subsurface drainfield.

E. WATER QUALITY PROTECTION STANDARD

1. The concentrations of COCs in waters passing through the Points of Compliance shall not exceed the Concentration Limits established pursuant to Monitoring and Reporting Program No. R5-2003-0022, which is attached to and made part of this Order.

F. FINANCIAL ASSURANCE

1. The Discharger shall have financial assurances to ensure closure of all WMUs as described in these Waste Discharge Requirements, and reclamation of the site as required by Lassen County and the Department of Conservation under the Surface Mining and Reclamation Act. The Discharger shall also have financial assurances to assure post-closure maintenance of the Tailings Impoundment, Heap Leach Pad, 7-Bench Acid Rock Disposal Facility, South Acid Rock Drainage Facility, and the discharge structures and drainfields for as long as the wastes pose a threat to water quality, in compliance with Title 27 requirements.
2. The Discharger shall, by **30 April of each year**, submit for approval by the Executive Officer, an updated demonstration of assurances of financial responsibility to ensure closure and post-closure maintenance of each waste management unit in accordance with its approved closure and post-closure maintenance plans. The Discharger shall provide the assurances of financial responsibility to the Central Valley Regional Water Quality Control Board as required by Title 27. The assurances of financial responsibility shall provide that funds for closure and post-closure maintenance with respect to water quality shall be available to the Regional Board upon the issuance of any order under California Water Code, Division 7, Chapter 5. The Discharger shall adjust the cost annually to account for inflation and any changes in facility design, construction, or operation.

G. PROVISIONS:

1. The Discharger shall comply with the “Standard Provisions and Reporting Requirements for Waste Discharge Requirements”, dated August 1997, which are attached as a part of this Order.
2. The Discharger shall comply with the attached Monitoring and Reporting Program No. R5-2003-0022 and any revisions thereto as ordered by the Executive Officer.

3. The Discharger shall comply with the notification requirements of §21710(c) of Title 27.
4. Surface drainage within the waste management facility shall either be contained on-site or be discharged in accordance with applicable storm water regulations.
5. The Discharger shall maintain a Storm Water Pollution Prevention Plan and Monitoring Program and Reporting Requirements in accordance with State Water Resources Control Board Order No. 97-03-DWQ, or retain all storm water on-site.
6. These requirements are conditional upon receipt of all local and state permits for the project and are not intended to limit or reduce any obligations or requirements which are imposed by any other authority having jurisdiction regarding the Project.
7. By **15 September** of each year, the Discharger shall submit an **annual** report to the Board. The report shall contain tabular, graphical, and narrative summaries of the monitoring data obtained during the previous year. In addition, the Discharger shall discuss the compliance record and any corrective actions taken or planned which may be needed to bring the discharge into full compliance with the waste discharge requirements.
8. The Discharger must comply with all conditions of this Order including timely submittal of technical and monitoring reports as directed by the Executive Officer. Violations may result in enforcement action, including Regional Board or court orders requiring corrective action, imposition of civil monetary liability, or revision or rescission of this Order.
9. The Board will review this Order periodically and may revise requirements when necessary.
10. The Discharger shall comply with all applicable provisions of Title 27 that are not specifically referred to in this Order.
11. The Discharger shall complete the tasks contained in these waste discharge requirements in accordance with the following time schedule:

<u>Task</u>	<u>Compliance Date</u>
A. Financial Assurance Review Annual Review of Financial Assurance for closure and post-closure maintenance (see Financial Assurances F.2.)	30 September each year
B. Sample Collection and Analysis Plan Submit the Sample Collection and Analysis Plan	1 April 2003
C. Submit Evidence Of Property Deed Restrictions (see Closure Specification D.8.)	One year from adoption of this Order.
D. Annual Monitoring Report Submit Annual Monitoring Report (see Provision G.7.)	15 September of each year

I, THOMAS R. PINKOS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 31 January 2003.

THOMAS R. PINKOS, Executive Officer

Attachments

PVW: sae