

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2005-0096

WASTE DISCHARGE REQUIREMENTS
FOR
MILLENNIUM HOLDINGS, LLC
CLOSURE OF THE
RISING STAR WASTE ROCK CONTAINMENT FACILITY
SHASTA COUNTY

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

1. Millennium Holdings, LLC (hereafter Discharger) submitted a Report of Waste Discharge (ROWD), dated April 13, 2005, requesting Waste Discharge Requirements (WDRs) for the Rising Star Waste Rock Containment Facility.
2. The ROWD contained a Waste Rock Cell Design Report, Construction and Operation Plan with specifications, Construction Quality Assurance Plan, a Post-Closure Maintenance Plan, and a Contingency Plan for the proposed facility.

DESCRIPTION OF THE SITE

3. The Rising Star Mine is an inactive copper mine in central Shasta County near Shasta Lake, approximately 10 miles northeast of Shasta Dam as shown on Attachment A which is incorporated here in and made part of this Order. The site is located in Section 21, Township 34 North, Range 3 West, and comprises Assessor's Parcel No. 026-110-008. Surface drainage is to an unnamed tributary to Horse Creek, which flows into Shasta Lake.
4. The Rising Star Mine and nearby Bully Hill Mine were initially worked for gold and silver in the early 1860's. In the late 1800's through 1927, copper, and zinc were also mined. Although exploratory work was performed in the area in the 1950's, there has been no production since 1927. The extraction of ore from the mines resulted in extensive development of underground workings and creation of large waste rock dumps. The mine workings and waste rock dumps are the principal sources of low pH, metal laden discharges referred to as acid rock drainage (ARD).
5. ARD historically discharged from the lower portals of the Rising Star Mine which have been recently plugged. ARD continues to seep from fractures in the bedrock and enter an unnamed tributary to Horse Creek which is tributary to Shasta Lake. This discharge is regulated by Waste Discharge Requirements Order No. R5-2003-0039 (National Pollution Discharge Elimination System (NPDES) Permit No. CA0084212), and Cease and Desist Order No. R5-2003-0051.
6. Cease and Desist Order R5-2003-0051 requires, in part, the Discharger to conduct remedial actions to abate the impact of ARD from historic mining activities at the Bully Hill and

Rising Star Mines. The two main mine portals of the Rising Star Mine were sealed by the Discharger in 2004, appreciably reducing ARD discharges to surface waters. The Discharger, in complying with Order No. R5-2003-0051, is proposing to construct the waste rock containment facility to continue its remediation efforts at the site.

7. The objective of the proposed 2-acre waste rock containment facility is to abate the impacts of ARD from historic mine waste rock dumps to surface waters. Reductions in discharges of ARD will be accomplished by consolidating several smaller waste rock piles to the largest pile, and covering the waste rock with a engineered low permeability cap to prevent infiltration of precipitation. The design of the waste rock containment facility was prepared in accordance with applicable regulations governing the handling of mining waste materials contained in California Code of Regulations, Title 27 (Title 27).
8. The Rising Star Mine is in an area of volcanic and metamorphic rocks of the Klamath Mountains Physiographic province. This area is bounded by the Coast Ranges and Great Valley Provinces to the south, the Coast Ranges Province to the west, and to the east by the Cascade Ranges Province. The project is in the Eastern Paleozoic and Triassic Belt of the Klamath Mountains at elevations range from 1,200 to 1,430 feet above mean sea level. The climate at Rising Star Mine is moderate with average summer temperatures reaching 95 °F and average winter temperatures of 39 °F.
9. The Eastern Paleozoic and Triassic Belt of the Klamath Mountains Province is characterized by interbedded metasedimentary and metavolcanic rocks ranging in age from Middle Devonian to Late Triassic. Formations underlying the site, from youngest to oldest, consist of alluvium, colluvium, and the Bully Hill Rhyolite (the host rock to the massive sulfide deposits). Alluvial and colluvial soils range in thickness from a few feet to over 30 feet. The thickness of the Bully Hill Rhyolite is up to 3,500 feet in the project region.
10. There are no known Holocene faults that project through or adjacent to the site. The nearest Quaternary-age fault is the Battle Creek fault about 25 miles southeast of the site.
11. Groundwater is found in minor quantities in fractures of the Bully Hill Rhyolite. Ground water quality in the immediate area of the waste rock disposal unit is of poor quality due to the oxidation of natural sulphide deposits. Excluding monitoring wells, there are no known wells within a radius greater than one mile from the site. Due to current land uses (the site is surrounded my National Forest), zoning and remote access, the use of groundwater for domestic, municipal, or agricultural supply is not anticipated in the foreseeable future.
12. The average annual rainfall is about 62 inches per year as measured at the Shasta Dam weather station, approximately 10 miles southwest of the mine. Average annual evaporation is about 66 inches per year as measured at the Shasta Dam station.
13. The 25-year, 24-hour storm event is estimated to be 11 inches of precipitation according to Shasta County Drainage Design standards issued by Shasta County, 1995. The runoff

volume from the 25-year, 24-hour storm calculated for the cell and upstream drainage is 105 cubic feet per second.

14. Surface water drainage is via an unnamed tributary to Horse Creek. The facility is not located within a 100-year flood plain.
15. The proposed containment facility is surrounded by barren rock, mine workings, and timberland. There are no structures within 2 miles of the site.

WASTES AND THEIR CLASSIFICATIONS

16. Section 22480, Title 27 defines the classification of mining wastes. Section 22480(B)(2)(b), Title 27 defines Group B mining wastes as “mining 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...”
17. Samples of the waste rock were analyzed for the potential to generate ARD. The analytical results indicate that a portion of the waste rock has the potential to generate ARD which can lower the pH and leach metals into surface waters in concentrations which exceed water quality objectives for copper, zinc, and cadmium. This material is classified as a Group B waste pursuant to Section 22480 (B)(2)(b), Title 27.

DESIGN OF WASTE MANAGEMENT UNITS

18. Section 22470, Title 27, allows the Regional Board to exempt a Group B mine waste management unit (WMU) from certain provisions of Title 27 for liners and leachate collection and removal systems providing the Discharger can demonstrate that there is little ground water beneath the site and/or it is of poor quality and natural conditions will prevent lateral hydraulic interconnection with natural geologic materials containing ground water suitable for agricultural, domestic, or municipal beneficial uses.
19. The Discharger has provided documentation pursuant to Section 22470(c), Title 27 that 1) due to the nature of the bedrock underlying the site there is limited ground water and it is of poor quality, 2) the ground water that is present is limited in extent and cannot migrate to areas where it can contaminate ground water suitable for agricultural, domestic, or municipal beneficial uses, and 3) a contingency plan is in place to collect any seepage that may issue from the waste pile and treat it so as to protect surface water. Therefore, the waste rock disposal cell may be exempted from liners and leachate collection systems per Section 22470(c), Title 27.
20. The final cover will consist of 18 inches of compacted waste rock as a foundation layer, six-inches of smaller compacted rock to act as a cushion layer, 60 mil HDPE geomembrane, a composite drainage layer and geogrid soil reinforcement layer on the steeper slopes, and a 18 inch vegetation layer.

CLOSURE CONSTRUCTION

21. Construction of the waste rock containment facility is planned to be initiated in July 2005. Closure of the facility is planned to occur before October 2005.

SURFACE AND GROUND WATER CONDITIONS

22. 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.
23. The first encountered groundwater is about 17 to 45 feet below the ground surface. Groundwater elevations range from 1245 feet MSL to 1220 feet MSL. The groundwater is unconfined. The depth to groundwater fluctuates seasonally as much as 5 feet.
24. Monitoring data indicates background groundwater quality in the mineralized areas (the location of the waste rock containment facility) has an electrical conductivity (EC) up to 2,600 micromhos/cm, with elevated concentrations of cadmium, copper, and zinc.
25. The direction of groundwater flow is toward the southeast. The average groundwater gradient is approximately 0.43 feet per foot. The average groundwater velocity is 8 feet per year.
26. The designated beneficial uses of groundwater as specified in the Basin Plan are municipal, industrial, domestic, and agricultural supply.
27. Surface drainage is to Horse Creek, a tributary of Shasta Lake and the Sacramento River, in the Shasta Lake Drainage Hydrologic Area (506.20) of the Sacramento Basin.
28. The beneficial uses of Horse Creek (via the tributary rule of the Basin Plan) and Shasta Lake are municipal, industrial, and agricultural supply; recreation; esthetic enjoyment; navigation; groundwater recharge; freshwater replenishment; hydroelectric power generation; and preservation and enhancement of fish, wildlife, and other aquatic resources.

CEQA CONSIDERATIONS

29. The activities described in Findings 7 and 8 above are cleanup and abatement procedures implemented in an effort to reduce the discharge of pollutants in the form of ARD and heavy metals to surface water and groundwater. The action to adopt waste discharge requirements for this facility is exempt from the provisions of the California Environmental Quality Act (CEQA), Public Resource Code Section 21000, et seq., and the CEQA guidelines, in accordance with the Categorical Exemption described in Title 14, CCR, Section 15330, *Minor Actions to Prevent, Minimize, Stabilize, Mitigate or Eliminate the Release or Threat of Release of Hazardous Waste or Hazardous Substances*.

30. The Board has reviewed the Report of Waste Discharge and the Categorical Exemption and finds compliance with these waste discharge requirements will result no adverse impacts on water quality.

OTHER LEGAL REFERENCES

31. This Order implements:
 - a. The *Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin*, Fourth Edition;
 - 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

32. 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.
33. 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.
34. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.
35. 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 upon request.

IT IS HEREBY ORDERED that Millennium Holdings, LLC., its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

A. Discharge Prohibitions

1. The discharge of waste from sources other than the Rising Star Mine waste rock dumps are prohibited.
2. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater is prohibited.
3. The release of pollutants, or waste constituents in a manner which could cause an increase in a condition of nuisance, degradation, contamination, or pollution of groundwater to

occur, as indicated by the most appropriate statistical or non-statistical data analysis method and retest method listed in this Order, the Monitoring and Reporting Program, or the Standard Provisions and Reporting Requirements is prohibited.

4. The discharge of wastes outside of the WMU is prohibited.
5. The discharge of waste to the closed WMU is prohibited.

B. Discharge Specifications

1. The treatment or disposal of wastes shall not cause pollution or a nuisance as defined in the California Water Code, Section 13050.
2. Waste materials shall be confined to the WMU designated for that waste.
3. There shall be no permanent ponding of any liquid on top of the WMU. Standing water on the WMU is not permitted.

C. Facility Specifications

1. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order.
2. The Discharger shall immediately notify the Board of any flooding, unpermitted discharge of waste off-site, equipment failure, slope failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.
3. Water used for facility maintenance shall be limited to the minimum amount necessary for dust control, and construction.
4. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.

D. General WMU Construction

1. Materials used to construct liners shall have appropriate physical and chemical properties to ensure containment of discharged wastes over the operating life, closure, and post-closure maintenance period of the WMU.
2. The Discharger shall follow the Construction Quality Assurance Plan, dated 13 April 2005 for the facility.
3. Materials used to the toe drain shall have appropriate physical and chemical properties to ensure the required transmission of leachate over the life of the WMU and the post-closure maintenance period.

Supervision and Certification of Construction

4. All containment structures shall be designed and constructed under the direct supervision of a California registered civil engineer or a certified engineering geologist. Final cover

and drainage facilities shall be certified by that individual as meeting the prescriptive standards and performance goals of Title 27 and these WDRs.

E. Closure Construction Specifications

1. Upon completion of filling the WMU, but in no case later than 1 October 2005, a final cover shall be placed over the waste. The final cover shall be designed and constructed to function with a minimum of maintenance and consist of a two-foot thick foundation layer overlain by a 60 mil HDPE liner, which in turn is covered with a one foot protective soil layer, and capped with an erosion resistant rock layer.
2. Areas with slopes greater than 10 percent, surface drainage courses, and areas subject to erosion by wind or water shall be designed and constructed to prevent such erosion.
3. At least two permanent monuments shall be installed by a licensed land surveyor from which the location and elevation of all wastes, containment structures, and monitoring facilities can be determined throughout the post-closure maintenance period.
4. The top of the closed landfill shall be graded to at least a three-percent grade and maintained to prevent ponding.

Protection from Storm Events

5. Precipitation and drainage control systems of the closed WMU shall be maintained to accommodate the anticipated volume of precipitation and peak flows from surface runoff under 25-year, 24-hour precipitation conditions and to prevent, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, and washout under these conditions.
6. The closed WMU shall be maintained to prevent inundation or washout due to floods with a 10-year return period. 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.
7. The Discharger shall provide Board staff a minimum of **one week** notification prior to commencing any field activities related to the installation, repair, or abandonment of monitoring devices.

F. Detection Monitoring Specifications

1. The Discharger shall submit for Executive Officer review a Water Quality Protection Standards Report as provided in Monitoring and Reporting Program No. R5-2005-0096 by **1 September 2002**.
2. The Discharger shall submit for Executive Officer review and approval a Sample Collection and Analysis Plan by **1 September 2001**. The Sample Collection and Analysis Plan shall at a minimum include:
 - a. sample collection, including purging techniques, sampling equipment, and decontamination of sampling equipment;
 - b. sample preservation and shipment;
 - c. analytical procedures; and
 - d. chain of custody control.
3. Specific methods of collection and analysis must be identified. Sample collection, storage, and analysis shall be performed according to the most recent versions of *Standard Methods for the Examination of Water and Wastewater* (Standard Methods) and USEPA Methods, such as the latest editions, as applicable, of: (1) *Methods for the Analysis of Organics in Water and Wastewater* (USEPA 600 Series), (2) *Test Methods for Evaluating Solid Waste* (SW-846, latest edition), and (3) *Methods for Chemical Analysis of Water and Wastes* (USEPA 600/4-79-020), and in accordance with the approved Sample Collection and Analysis Plan.
4. If methods other than Standard Methods or USEPA-approved methods are used, the exact methodology shall be submitted for review and approval by the Executive Officer prior to use.
5. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, in accordance with Monitoring and Reporting Program No. R5-2005-0096.
6. The Discharger shall provide Board staff a minimum of **one week** notification prior to commencing any field activities related to the installation, repair, or abandonment of monitoring devices.
7. The Discharger shall comply with the Water Quality Protection Standard as specified in this Order, Monitoring and Reporting Program No. R5-2005-0096, and the Standard Provisions and Reporting Requirements, dated April 2000.

8. The concentrations of the Constituents of Concern in waters passing the Point of Compliance shall not exceed the concentration limits established pursuant to Monitoring and Reporting Program No. R5-2005-0096.
9. For each monitoring event, the Discharger shall determine whether the disposal cell is in compliance with the Water Quality Protection Standard using procedures specified in this Order, Monitoring and Reporting Program No. R5-2005-0096, and Section 20415(e) of Title 27.
10. For any given monitored medium, the samples taken from all monitoring points and background monitoring points to satisfy the data analysis requirements for a given reporting period shall all be taken **within a span not to exceed 30 days**, unless the Executive Officer approves a longer time period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible.
11. The methods of analysis and the detection limits used must be appropriate for the expected concentrations. For the monitoring of any constituent or parameter that is found in concentrations which produce more than 90% non-numerical determinations (i.e., "trace" or "ND") in data from background monitoring points for that medium, the analytical method having the lowest method detection limit (MDL) shall be selected from among those methods which would provide valid results in light of any matrix effects or interferences.
12. **"Trace" results** - results falling between the MDL and the practical quantitation limit (PQL) - shall be reported as such, and shall be accompanied both by the estimated MDL and PQL values for that analytical run.
13. **MDLs and PQLs** shall be derived by the laboratory for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs shall reflect the detection and quantitation capabilities of the specific analytical procedure and equipment used by the laboratory, rather than simply being quoted from USEPA analytical method manuals. In relatively interference-free water, laboratory-derived MDLs and PQLs are expected to closely agree with published USEPA MDLs and PQLs.
14. If the laboratory suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results shall be flagged accordingly, along with estimates of the detection limit and quantitation limit actually achieved. The MDL shall always be calculated such that it represents the lowest achievable concentration associated with a 99% reliability of a nonzero result. The PQL shall always be calculated such that it represents the lowest constituent concentration at which a numerical value can be assigned with reasonable certainty that it represents the constituent's actual concentration in the sample. Normally, PQLs should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure.

15. All **QA/QC data** shall be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation limits, the percent recovery, an explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and qualifications of the person(s) performing the analyses. Sample results shall be reported unadjusted for blank results or spike recoveries. In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged.
16. The statistical method shall account for data below the practical quantitation limit (PQL) with one or more statistical procedures that are protective of human health and the environment. Any PQL validated pursuant to Section 20415(e)(7) of Title 27 that is used in the statistical method shall be **the lowest concentration (or value) that can be reliably achieved** within limits of precision and accuracy specified in the WDRs for routine laboratory operating conditions that are available to the facility. The Discharger's technical report, pursuant to Section 20415(e)(7) of Title 27, shall consider the PQLs listed in Appendix IX to Chapter 14 of Division 4.5 of Title 22, California Code of Regulations, for guidance when specifying limits of precision and accuracy. For any given constituent monitored at a background or downgradient monitoring point, a trace detection shall be identified and used in appropriate statistical or non-statistical tests. Nevertheless, for a statistical method that is compatible with the proportion of censored data (trace and ND indications) in the data set, the Discharger can use the laboratory's concentration estimates in the trace range (if available) for statistical analysis, in order to increase the statistical power by decreasing the number of "ties.

The Discharger may propose an alternate statistical method [to the methods listed under Title 27 Section 20415(e)(8)(A-D)] in accordance with Section 20415(e)(8)(E) of Title 27, for review and approval by the Executive Officer.

G. Reporting Requirements

1. In the event the Discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the Discharger shall notify the appropriate Board office by telephone **within 24 hours** of it or its agents first having knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing **within two weeks**. The written notification shall state the nature, time, and cause of noncompliance, and shall describe the measures being taken to prevent recurrences and shall include a timetable for corrective actions.
2. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained for a minimum of five years from the date of the sample, measurement, report, or application. This period

may be extended during the course of any unresolved litigation regarding this discharge or when requested by the Executive Officer.

Such legible records shall show the following for each sample:

- a. Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;
 - b. Date, time, and manner of sampling;
 - c. Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;
 - d. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
 - e. Calculation of results; and
 - f. Results of analyses, and the MDL and PQL for each analysis.
3. A transmittal letter explaining the essential points shall accompany each monitoring report. At a minimum, the transmittal letter shall identify any violations found since the last report was submitted, and if the violations were corrected. If no violations have occurred since the last submittal, this shall be stated in the transmittal letter. The transmittal letter shall also state that a discussion of any violations found since the last report was submitted, and a description of the actions taken or planned for correcting those violations, including any references to previously submitted time schedules, is contained in the accompanying report.
4. Each monitoring report shall include a compliance evaluation summary. The summary shall contain at least:
- a. For each monitoring point and background monitoring point addressed by the report, a description of:
 - 1) the time of water level measurement;
 - 2) the type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;
 - 3) the method of purging (the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; the calibration of the field equipment; results of the pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water) to remove all portions of the water that was in the well bore while the sample was being taken;

- 4) the type of pump or other device used for sampling, if different than the pump or device used for purging; and a statement that the sampling procedure was conducted in accordance with the approved Sample Collection and Analysis Plan.
- b. A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.
- c. For each groundwater body, a description and graphical presentation of the gradient and direction of groundwater flow under/around the Unit, and the groundwater flow rate, based upon water level elevations taken prior to the collection of the water quality data submitted in the report.
- d. Laboratory statements of results of all analyses evaluating compliance with requirements.
- e. An evaluation of the effectiveness of the leachate monitoring and control facilities, and of the run-off/run-on control facilities.
- f. A summary and certification of completion of all **Standard Observations** for the Unit(s), for the perimeter of the Unit, and for the receiving waters. The Standard Observations shall include:
 - 1) For the Unit:
 - a. Evidence of ponded water at any point on the facility (show affected area on map); and
 - b. Evidence of erosion and/or of day-lighted refuse.
 - 2) Along the perimeter of the Unit:
 - a. Evidence of liquid leaving or entering the Unit, estimated size of affected area, and flow rate (show affected area on map); and
 - b. Evidence of erosion and/or of day-lighted refuse.
- g. The quantity and types of wastes discharged and the locations in the Unit where waste has been placed since submittal of the last such report.
5. The Discharger shall report by telephone any seepage from the disposal area including any flow from a previously dry LCRS, **within 24 hours** after it is discovered. A written report shall be filed with the Board **within seven days**, containing at least the following information:
 - a. A map showing the location(s) of seepage;

- b. An estimate of the flow rate;
 - c. A description of the nature of the discharge (e.g., all pertinent observations and analyses);
 - d. Verification that samples have been submitted for analyses of the Constituents of Concern and Monitoring Parameters, and an estimated date that the results will be submitted to the Board; and
 - e. Corrective measures underway or proposed, and corresponding time schedule.
6. The Discharger shall submit an **Annual Monitoring Summary Report** to the Board covering the reporting period of the previous monitoring year. This report shall contain:
- a. All monitoring parameters and Constituents of Concern shall be graphed so as to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous five calendar years. Each such graph shall plot the concentration of one or more constituents for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. For any given constituent or parameter, the scale for background plots shall be the same as that used to plot downgradient data. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
 - b. Unless otherwise exempted by the Executive Officer, all monitoring analytical data obtained during the previous two six-month reporting periods, shall be presented in tabular form as well as on 3.5" computer diskettes or CD-Rom, either in MS-Access, ASCII, or in another file format acceptable to the Executive Officer. Data sets too large to fit on a single diskette may be submitted on disk in a commonly available compressed format (e.g. PKZIP). The Board regards the submittal of data in hard copy and in digital format as "...the form necessary for..." statistical analysis [Section 20420(h)], in that this facilitates periodic review by the Board.
 - c. A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.
 - d. A map showing the area and elevations in which filling has been completed during the previous calendar year and a comparison to final closure design contours.
 - e. A written summary of the monitoring results, indicating any changes made or observed since the previous annual report.
 - f. An evaluation of the effectiveness of the leachate monitoring/control facilities.

H. Financial Assurance

1. The Discharger shall, by 15 January of each year, submit for approval by the Executive Officer, a demonstration of assurances for financial responsibility to ensure post-closure maintenance of the WMU in accordance with its approved post-closure maintenance plan. The Discharger shall establish an irrevocable fund or other means specified in Title 27, California Code of Regulations, Division 2, Chapter 6, Subchapter 2, naming the Regional Water Quality Control Board, Central Valley Region, as beneficiary. The assurances of financial responsibility shall provide that funds for post-closure maintenance of the WMU shall be available to the Regional Board upon the issuance of any order under California Water Code, Division 7. The Discharger shall adjust the cost annually to account for inflation and any changes in facility design, construction or operation.
2. The financial assurance mechanism shall be reviewed annually and revised as necessary. A report demonstrating the adequacy of the financial assurance mechanism shall be submitted by **31 January** of each year following the adoption of this Order.

If the existing financial assurance mechanism is determined to be inadequate, or if the Discharger purposes to submit a different one, the Discharger shall submit a draft proposed financial assurance mechanism to the Executive Officer for review and approval. The proposal shall contain provisions to ensure that the Discharger shall maintain assurances of financial responsibility for initiating and completing corrective action for all known or reasonably foreseeable releases from the Class II surface impoundments. A final financial assurance mechanism, as approved by the Executive Officer, shall be submitted to the Board within **120 days** of the draft financial assurance mechanism.

I. Provisions

1. The Discharger shall maintain a copy of this Order at the facility during construction and with the office of the personnel overseeing the post-closure maintenance and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.
2. The Discharger shall comply with all applicable provisions of Title 27 that are not specifically referred to in this Order.
3. The Discharger shall comply with Monitoring and Reporting Program No. R5-2005-0096, which is incorporated into and made part of this Order.
4. The Discharger shall comply with the applicable portions of the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Title 27 and/or Subtitle D (27 CCR Section 20005 et seq. and 40 CFR 258 et seq.)*, dated April 2000, which are hereby incorporated into this Order.
5. All reports and transmittal letters shall be signed by persons identified below:

- a. For a corporation: by a principal executive officer of at least the level of senior vice-president.
 - b. For a partnership or sole proprietorship: by a general partner or the proprietor.
 - c. For a municipality, state, federal or other public agency: by either a principal executive officer or ranking elected or appointed official.
 - d. A duly authorized representative of a person designated in a, b or c above if;
 - 1) the authorization is made in writing by a person described in a, b, or c of this provision;
 - 2) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a Unit, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
 - 3) the written authorization is submitted to the Board.
 - e. Any person signing a document under this Section shall make the following certification:

“I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.”
6. The Discharger shall take all reasonable steps to minimize any adverse impact to the waters of the State resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature, extent, and impact of the noncompliance.
 7. The Discharger shall have the continuing responsibility to assure protection of waters of the state from discharged wastes and from leachate generated by discharged waste during the active life, closure, and post-closure maintenance period of the Unit(s) and during subsequent use of the property for other purposes.
 8. The fact that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this Order shall not be regarded as a defense for the Discharger’s violations of the Order.

9. To assume ownership or operation under this Order, the succeeding owner or operator must apply in writing to the Board requesting transfer of the Order within 14 days of assuming ownership or operation of this facility. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Board, and a statement. The statement shall comply with the signatory requirements contained in Provision I.5. and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer of this Order shall be approved or disapproved by the Board.
10. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order.
11. The Discharger or persons employed by the Discharger shall comply with all notice and reporting requirements of the State Department of Water Resources with regard to the construction, alteration, destruction, or abandonment of all monitoring wells used for compliance with this Order or with Monitoring and Reporting Program No. R5-2005-0096, as required by Sections 13750 through 13755 of the California Water Code. A record of the abandonment of such wells shall be sent to the Board.
12. The Discharger shall maintain waste containment facilities and precipitation and drainage controls, and shall continue to monitor groundwater and surface waters per Monitoring and Reporting Program No. R5-2005-0096 throughout the post-closure maintenance period.
13. 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 the waste management units or of precipitation and drainage control structures.
14. The post-closure maintenance period shall continue until the Board determines that remaining wastes in the landfill will not threaten water quality.
15. The Board will review this Order periodically and will revise the requirements when necessary.

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2005-0096
MILLENNIUM HOLDINGS, LLC.
RISING STAR WASTE ROCK CONTAINMENT FACILITY
SHASTA COUNTY

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I, THOMAS R. PINKOS, Executive Officer, do hereby verify 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 24 June 2005.

THOMAS R. PINKOS, Executive Officer

Attachments

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2005-0096

FOR

MILLENNIUM HOLDINGS, LLC
CLOSURE OF THE
RISING STAR WASTE ROCK CONTAINMENT FACILITY
SHASTA COUNTY

Compliance with this Monitoring and Reporting Program, with Title 27, California Code of Regulations, Section 20005, et seq. (hereafter Title 27), and with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Title 27 and/or Subtitle D (27 CCR §20005 et seq. and 40 CFR 258)*, dated April 2000, is ordered by Waste Discharge Requirements Order No. R5-2005-0096.

A. REQUIRED MONITORING REPORTS

| <u>Report</u> | <u>Due</u> |
|--|---------------------|
| 1. Groundwater Monitoring (Section D.1) | See Table I |
| 2. Annual Monitoring Summary Report (Order No. R5-2005-0096, G.6.) | 31 January |
| 3. Unsaturated Zone Monitoring (Section D.2) | See Table I |
| 4. Storm Event Monitoring (Section E.) | As indicated |
| 5. Response to a Release (Standard Provisions and Reporting Requirements) | As necessary |

B. REPORTING

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required in Order No. R5-2005-0096 and the Standard Provisions and Reporting Requirements. Reports which do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the waste discharge requirements. In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Data shall also be submitted in a digital format acceptable to the Executive Officer.

Each monitoring report shall include a compliance evaluation summary as specified in Section G. Reporting Requirements, of Order No. R5-2005-0096.

Field and laboratory tests shall be reported in each monitoring report. Semiannual and annual monitoring reports shall be submitted to the Board in accordance with the

following schedule for the calendar period in which samples were taken or observations made.

| <u>Sampling Frequency</u> | <u>Reporting Frequency</u> | <u>Reporting Periods End</u> | <u>Report Date Due</u> |
|---------------------------|----------------------------|------------------------------|------------------------|
| Semiannually | Semiannually | 30 June | 31 July |
| | | 31 December | 31 January |
| Annually | Annually | 31 December | 31 January |

The Discharger shall submit an **Annual Monitoring Summary Report** to the Board covering the previous monitoring year. The annual report shall contain the information specified in G. Reporting Requirements, of Order No. R5-2005-0096, and a discussion of compliance with the waste discharge requirements and the Water Quality Protection Standard.

The results of **all monitoring** conducted at the site shall be reported to the Board in accordance with the reporting schedule above for the calendar period in which samples were taken or observations made.

C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

1. Water Quality Protection Standard Report (Report)

For each waste management unit (unit), the Water Quality Protection Standard shall consist of all Constituents of Concern, the concentration limit for each constituent of concern, the point of compliance, and all water quality monitoring points. The Executive Officer shall review and approve the Water Quality Protection Standard, or any modification thereto, for each monitored medium.

The report shall:

- a. Identify **all distinct bodies of surface and groundwater** that could be affected in the event of a release from a Unit or portion of a Unit. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.
- b. Include a map showing the monitoring points and background monitoring points for the groundwater monitoring program and the unsaturated zone monitoring program. The map shall include the point of compliance in accordance with §20405 of Title 27.
- c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).

If subsequent sampling of the background monitoring point(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste management activities at the site, the Discharger may request modification of the Water Quality Protection Standard.

2. Constituents of Concern

The Constituents of Concern include all the waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the Unit. The Constituents of Concern are listed in Table I for groundwater, unsaturated zone, and leachate monitoring

3. Monitoring Parameters

Monitoring parameters are Constituents of Concern that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a Unit. The monitoring parameters are those listed in Table I for ground water and the unsaturated zone.

4. Concentration Limits

For naturally occurring Constituents of Concern or non-naturally occurring Constituents of Concern that have background values, the concentration limit for each constituent of concern shall be determined as follows:

- a. By calculation in accordance with a statistical method pursuant to §20415 of Title 27; or
- b. By an alternate statistical method acceptable to the Executive Officer in accordance with §20415 of Title 27.

5. Point of Compliance

The point of compliance for the water standard is a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the Unit.

6. Compliance Period

The compliance period for each Unit shall be the number of years equal to the active life of the Unit plus the closure period. The compliance period is the minimum period during which the Discharger shall conduct a water quality monitoring program subsequent to a release from the Unit. The compliance period shall begin anew each time the Discharger initiates an evaluation monitoring program.

D. DETECTION MONITORING

The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater and the unsaturated zone, in accordance with Detection Monitoring Specifications of Waste Discharge Requirements, Order No. R5-2005-0096. All monitoring shall be conducted in accordance with an approved Sample Collection and Analysis Plan, which includes quality assurance/quality control standards, that is acceptable to the Executive Officer.

All point of compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard. All detection monitoring program groundwater monitoring wells, unsaturated zone monitoring devices, and leachate monitoring points shall be sampled and analyzed as indicated and listed in Tables I and II.

Method detection limits and practical quantitation limits shall be reported. All peaks shall be reported, including those which cannot be quantified and/or specifically identified.

The Discharger may, with the approval of the Executive Officer, use alternative analytical test methods, including new USEPA approved methods, provided the methods have method detection limits equal to or lower than the analytical methods specified in this Monitoring and Reporting Program.

1. Groundwater

The Discharger shall install and operate a groundwater detection monitoring system that complies with the applicable provisions of §20415 and §20420 of Title 27 in accordance with a Detection Monitoring Program approved by the Executive Officer. The Discharger shall collect, preserve, and transport groundwater samples in accordance with the approved Sample Collection and Analysis Plan.

At each sampling event, the Discharger shall determine the groundwater flow rate and direction in the uppermost aquifer and in any zones of perched water and in any additional zone of saturation monitored pursuant to this Monitoring and Reporting Program, and report the results semiannually, including the times of highest and lowest elevations of the water levels in the wells.

Hydrographs of each well shall be submitted showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be prepared, based on quarterly measurements, and submitted annually.

Groundwater samples shall be collected from the point-of-compliance wells, background wells, and any additional wells added as part of the approved groundwater monitoring system. Samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table I. All monitoring parameters shall be graphed so as to show historical trends at each monitoring point.

2. Unsaturated Zone Monitoring

The discharge pipe of the toe drain of the disposal cell shall serve as the unsaturated zone monitoring point. The Discharger shall collect, preserve, and transport samples in accordance with the quality assurance/quality control standards contained in the approved Sample Collection and Analysis Plan.

Samples shall be collected from the toe drain **immediately** upon detection of the discharge of liquid in a previously dry sump, and on a semi-annual bases thereafter. The collected samples shall be analyzed for the listed constituents in accordance with the methods and frequency specified in Table I.

The quantity of liquid shall be measured and reported as Toe Drain Flow Rate (in gallons/day).

All monitoring parameters shall be graphed so as to show historical trends at each monitoring point.

E. STORM EVENT MONITORING

The Discharger shall inspect all precipitation, diversion, and drainage facilities for damage **within 7 days** following *major storm events* or as early as access allows. Necessary repairs shall be completed **within 30 days** of the inspection. The Discharger shall report any damage and subsequent repairs within 45 days of completion of the repairs, including photographs of the problem and the repairs.

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

Ordered by: _____
THOMAS R. PINKOS, Executive Officer

(Date)

TABLE I
DETECTION MONITORING PROGRAM

| <u>Parameter</u> | <u>Units</u> | <u>Frequency</u> ¹ |
|--------------------------------|--------------------------|-------------------------------|
| Field Parameters | | |
| Groundwater Elevation | Ft. & hundredths, M.S.L. | Semiannual |
| Temperature | °C | Semiannual |
| Electrical Conductivity | µmhos/cm | Semiannual |
| pH | pH units | Semiannual |
| Turbidity | Turbidity units | Semiannual |
| Monitoring Parameters | | |
| Total Dissolved Solids (TDS) | mg/L | Semiannual |
| Sulfide | mg/L | Semiannual |
| Iron | mg/l | Semiannual |
| Constituents of Concern | | |
| Copper | ug/l | Semiannual |
| Cadmium | ug/l | Semiannual |
| Zinc | ug/l | Semiannual |

¹Semiannual samples shall be collected in February and August of each year

TABLE II
CONSTITUENTS OF CONCERN & APPROVED ANALYTICAL METHODS

| <u>Inorganics (dissolved):</u> | <u>USEPA Method</u> |
|--------------------------------|---------------------|
| Cadmium | 7131A |
| Copper | 6010 |
| Zinc | 6010 |
| Iron | 6010 |
| Sulfide | 9030B |

INFORMATION SHEET

ORDER NUMBER R5-2005-0096
MILLENNIUM HOLDINGS, LLC.
CLOSURE OF THE RISING STAR WASTE ROCK
CONTAINMENT FACILITY
SHASTA COUNTY

The Rising Star Mine is one of two neighboring inactive copper mines in the East Shasta Copper Mining District in central Shasta County near Shasta Lake, approximately 10 miles northeast of Shasta Dam.

The Rising Star and Bully Hill Mines were initially worked for gold and silver in the early 1860's. In the late 1800's through 1927, copper, and zinc were also mined. Although exploratory work was performed in the area in the 1950's, there has been no production since 1927. The extraction of ore from the mines resulted in extensive development of underground workings, creation of large waste rock dumps, and tailings piles at the nearby Bully Hill Smelter. The mine workings and waste rock dumps are the principal sources of low pH, metal laden discharges referred to as acid rock drainage (ARD).

ARD historically discharged from the lower portals of the Rising Star Mine which have been recently plugged; however ARD continues to seep from the bedrock and enter surface waters. This discharge is regulated by Waste Discharge Requirements Order No. R5-2003-0039 (National Pollution Discharge Elimination System (NPDES) Permit No. CA0084212), and Cease and Desist Order No. R5-2003-0051. The C&D Order requires, in part, the Discharger to conduct remedial actions to abate the impact of ARD from historic mining activities at the Bully Hill and Rising Star Mines. The two main mine portals of the Rising Star Mine were sealed by the Discharger in 2004, appreciably reducing ARD discharges to surface waters. The Discharger, in complying with the C&D Order is proposing to construct the waste rock containment facility to continue its remedial activities at the site.

The objective of the proposed 2-acre waste rock containment facility is to abate impacts of ARD from historic mine waste rock dumps to the surface waters. Abatement will be accomplished by relocating several smaller waste rock piles to the largest pile, and covering the waste rock with a engineered low permeability cap to prevent infiltration of precipitation. The design of the waste rock containment facility was prepared in accordance with applicable regulations governing the handling of mining waste materials contained in California Code of Regulations, Title 27 (Title 27).

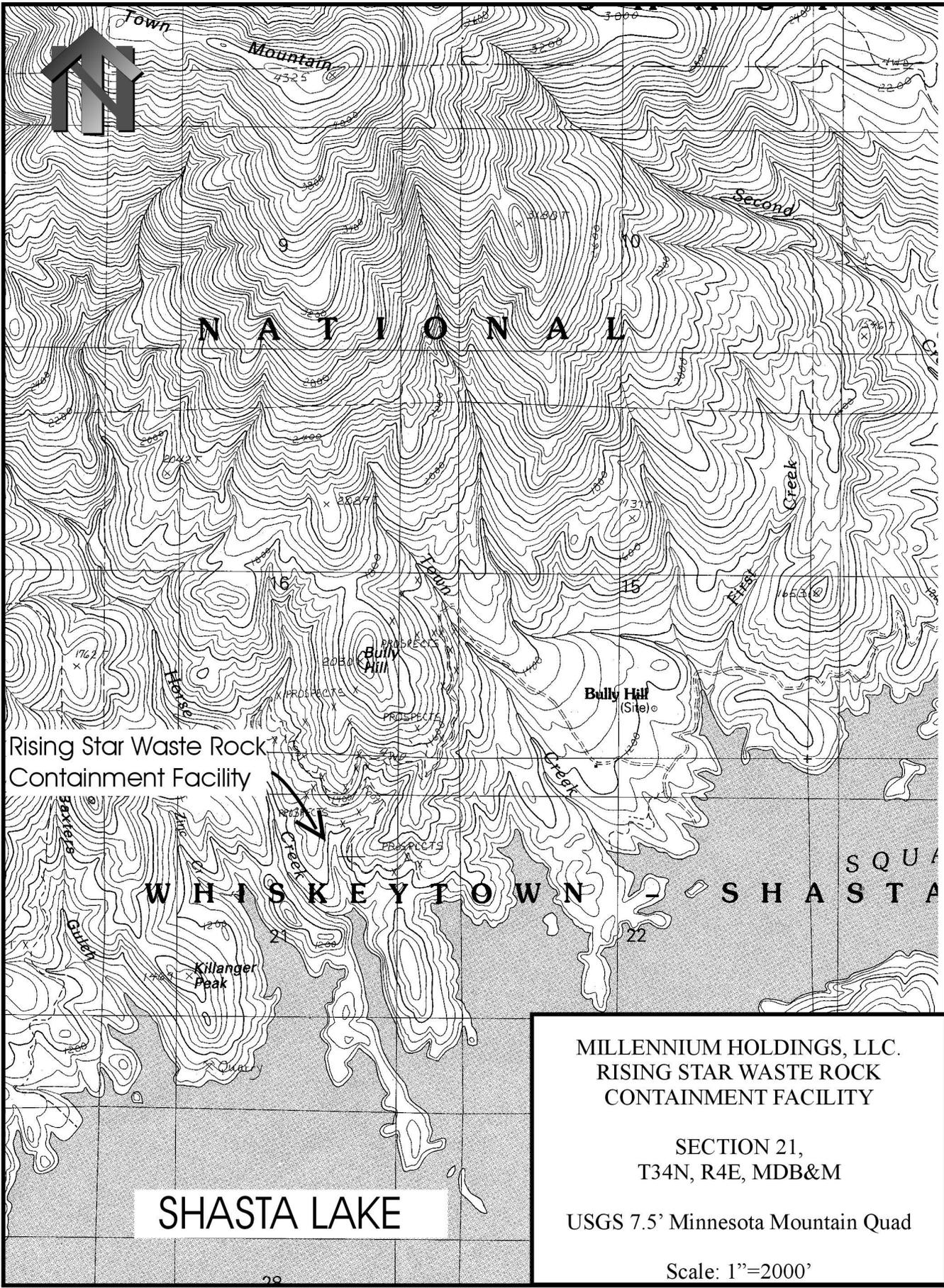
Groundwater beneath the site is found minor quantities in fractures of the Bully Hill Rhyolite. Ground water quality in the immediate area of the waste rock disposal unit is of poor quality due to the oxidation of natural sulphide deposits. Excluding monitoring wells, there are no known wells within a radius greater than one mile from the site. Due to current land uses (the site is surrounded by National Forest), zoning, and remote

access, the use of groundwater for domestic, municipal, or agricultural supply is not anticipated in the foreseeable future.

The Discharger has provided documentation pursuant to Section 22470(c), Title 27 that 1) due to the nature of the bedrock underlying the site there is limited ground water and it is of poor quality, 2) the ground water that is present is limited in extent and cannot migrate to areas where it can contaminate ground water suitable for agricultural, domestic, or municipal beneficial uses, and 3) a contingency plan is in place to collect any seepage that may issue from the waste pile and treat it so as to protect surface water. Therefore, the waste rock disposal cell may be exempted from liners and leachate collection systems per Section 22470(c), Title 27.

The construction of the waste rock containment facility is a remedial activity being implemented in an effort to reduce the discharge of pollutants to surface water and groundwater. As such, the Categorical Exemption for compliance with CEQA as described in California Code of Regulations, Title 14, Section 15330, *Minor Actions to Prevent, Minimize, Stabilize, Mitigate or Eliminate the Release or Threat of Release of Hazardous Waste or Hazardous Substances* is applicable.

Surface water drainage is to an un-named tributary to Horse Creek which drains to Shasta Lake.



Rising Star Waste Rock Containment Facility

MILLENNIUM HOLDINGS, LLC.
RISING STAR WASTE ROCK
CONTAINMENT FACILITY

SECTION 21,
T34N, R4E, MDB&M

USGS 7.5' Minnesota Mountain Quad

SHASTA LAKE

Scale: 1"=2000'