

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ORDER NO. R5 2011-0026

WASTE DISCHARGE REQUIREMENTS  
FOR

SHASTA GOLD CORPORATION,  
AND  
FRENCH GULCH (NEVADA) MINING CORPORATION,  
  
TAILINGS AND WASTE ROCK DISPOSAL FACILITIES  
WASHINGTON MINE  
SHASTA COUNTY

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

1. Shasta Gold Corporation and its subsidiary, French Gulch (Nevada) Mining Corporation, submitted a Report of Waste Discharge (ROWD), dated 30 September 2009, for mill tailings and waste rock disposal facilities at the Washington Mine and mill, an underground gold mine about 2 miles west of French Gulch, Shasta County. Shasta Gold Corporation and French Gulch (Nevada) Mining Corporation are designated hereafter as Discharger.
2. The Discharger owns and operates the Washington Mine and mill which is comprised of unpatented and patented claims totaling 1,825 acres, in Sections 7, 17, and 18, Township 33 North, Range 7 West, MDB&M as shown in Attachment A which is incorporated herein and made part of this Order. The unpatented claims are on federal land administered by the U.S. Department of Interior, Bureau of Land Management (BLM). The current tailings and waste rock disposal areas, and the proposed Group B tailings disposal facility are entirely on patented claims comprised of Shasta County Assessor's Parcel Numbers 046-340-002 and 046-340-003.
3. The disposal of tailings at the mine is currently regulated, in part, by Order No 96-289 which allowed for the disposal of mine tailings into unlined ponds at the mill and then moved to an unlined disposal area on patented claims. Order No. 96-289 is inconsistent with current regulations and policies for regulation of mining waste, does not reflect current operations and discharges, and is not adequately protective of water quality.

## FACILITY OPERATIONS

4. Ore and waste rock are removed from the underground mine with waste rock being placed in a designated disposal area. Ore is processed through a mill where the particle size is reduced and gold is separated with gravity jigs and finally through flotation cells. In the flotation cells, chemical reagents are added to allow the gold bearing particles to adhere or “float” on bubbles which are skimmed from the processing solution. The processing solution is recycled back through the mineral recovery system. The spent material, referred to as tailings, is dried through a filter screen and stockpiled adjacent to the mill until they can be transported to the tailings disposal facility. The mill circuit is a closed loop system with no discharge. Reagents used in the mill site include copper sulfate, methyl isobutyl carbinol, and potassium xanthate.
5. Previous mining operations accumulated mill tailings in a pile about 300 by and 220 feet totaling approximately 20,000 yd<sup>3</sup>. An additional 25,000 yd<sup>3</sup> may be produced over the next three years. Future operations may include mixing the tailings with Portland cement and using it as a paste backfill to fill voids in previously mined areas. The paste backfill process is beyond the scope of this Order and a new ROD and revised WDRs will be required to utilize this disposal method.
6. In 2008, the previous owner Bullion River Gold Corp and French Gulch (Nevada) Mining Corporation excavated the New Adit, a decline 1,533 feet in length, to reach newly discovered veins. This generated about 21,250 yd<sup>3</sup> of loose waste rock, some with significant mineralization that requires disposal in an engineered containment facility.

## WASTE CHARACTERIZATION

7. California Code of Regulations, Division 2, Title 27, Subchapter 1, Article 1, §22480 (Title 27), classifies mining wastes in three Groups; A, B, and C as follows: *“Group A wastes must be managed as hazardous waste pursuant to Chapter 11 of Division 4.5, of Title 22, California Code of Regulations (Title 22 CCR), provided Regional Water Board staff finds that such mining wastes pose a significant threat to water quality. Group B mining wastes are either; wastes that consist of or contain hazardous wastes that qualify for a variance under Title 22 CCR, provided Regional Water Board staff finds that such mining wastes pose a low threat to water quality; or mining wastes that consist of or contain non-hazardous soluble pollutants of concentrations that exceed water quality objectives (WQOs) for, or could cause, degradation of waters of the state. Group C wastes are wastes from*

*any discharge that would be in compliance with the applicable water quality control plan, including WQOs other than turbidity.”*

8. Title 27 further provides...*”In reaching decisions regarding classification of mining waste as Group B or Group C, Regional Water Board staff can consider the following factors: (1) whether the waste contains hazardous constituents only at low concentrations; (2) whether the waste has no or low acid generating potential; and (3) whether, because of its intrinsic properties, the waste is readily containable by less stringent measures.”*
9. The mill tailings are fine grained, dense, cohesive, and of low permeability. Analyses of the tailings has shown they contain significant arsenic, on occasion exceeding the hazardous waste criteria. However, data shows the tailings have little or no acid generating potential with a neutralization potential to acid generation potential ratio well above 3. Analyses of the tailings using distilled water as the extractant, simulating rainfall, shows arsenic in the leachate below 1 mg/l. Based on this information the mill tailings are classified as a Group B waste.
10. Waste rock from the mine-that rock which does not contain economic concentrations of minerals-can still be highly mineralized and contain concentrations of waste constituents, mainly arsenic, that exceed the hazardous waste criteria. The waste rock is commonly larger grained than the tailings. Mineralized waste rock with elevated constituents that may pose a threat to water quality is classified as a Group B mining waste and must be placed in an engineered containment facility. Non-mineralized waste rock, or waste rock with low concentrations of natural mineral constituents that do not pose a threat to water quality is classified as a Group C mining waste and may be placed in the Group C disposal area. To distinguish between Group B and Group C waste rock, monitoring of the waste rock is required as part of the Monitoring and Reporting Program attached to this Order.

## **SITE DESCRIPTION**

11. The Washington is in the Klamath Mountain Geological Province, a northwest-to-southeast trending belt of faulted and folded Paleozoic sedimentary and metamorphic rocks, and Cenozoic intrusive igneous rocks. Local formations include the Copley Greenstone, Bragdon, Birdseye Porphyry and Quartz Porphyry Intrusives, alluvium, and colluvium. The Copley Greenstone Formation is comprised of metamorphosed andesites and marine volcanoclastic sedimentary rocks. The Bragdon Formation is mostly siliceous shale, slate, and mudstone, with inter-bedded sandstone and conglomerate. Bedding orientations in the Copley and Bragdon

Formations are highly variable. Birdseye Porphyry and Quartz Porphyry Intrusives crosscut the Copley and Bragdon along high-angle reverse faults that trend generally east-west, and northwest-southeast. Alluvium and colluvium are largely debris- and earth-slide deposits, and soils. The waste disposal areas overlie the Bragdon, Birdseye Porphyry Intrusives, and saprolitic soils derived from weathering of the intrusives.

12. Faults within the mine area show no evidence of surface displacement within 1.6 million years. Between 1800 and 2006, 53 earthquakes within 100 miles of the disposal areas had moment magnitudes greater than 5.0 with three greater than 6.5. In 1998, an earthquake with a moment magnitude of 5.2 occurred with an epicenter 11 miles east. The local bedrock acceleration at the disposal area was estimated approximately 0.14g for a maximum probable earthquake.
13. In 1852, following discovery of a gold-bearing quartz vein at grade, the Washington Mine began operations as a sluicing operation of decomposed bedrock. From 1855 to 1865, operations expanded underground along veins as shallow vertical shafts, horizontal stopes and drifts. Over the years several following decades, deeper adits and exploration tunnels through non-producing rock were developed. In 1869, on-site ore processing began with a stamp mill. In 1938, the stamp mill ceased, and ore processing was upgraded to crushing, ball-milling, gravity concentration, and froth flotation.
14. The Washington Mine is a complex of mine portals, tunnels, and underground workings within an established gold mining district with numerous historical and active mines within five miles. Within the district, ore veins are mainly hydrothermal quartz derived from intrusive rocks, with accessory metal sulfides including pyrite, arsenopyrite, sphalerite, and galena. Gold is associated with arsenopyrite and galena.
15. The tailings and waste rock disposal areas are in forest clearings at elevations ranging about 2,500 to 2,700 feet above mean sea level on a slope of about 20%. Slopes downhill of the disposal areas are generally forest-covered, and range 40% to 80%. Run-off drains east toward the Right Fork of French Gulch, and south toward Scorpion Gulch.
16. Average annual rainfall is 66 inches, and mostly occurs between October and April. Average annual evaporation is 70 to 80 inches per year, and mostly occurs between April and September. The predicted 100-year, 24-hour storm is 10.98 inches.
17. Local land uses are mining, timber, and recreation. A residence is about one mile south of the disposal areas, on Tom Green Road. The Federal

Emergency Management Agency does not currently issue flood insurance maps for unincorporated areas of Shasta County, however the disposal areas are not within a 100-year flood plain.

18. Natural springs are about 0.8 miles north and 0.9 miles west of the disposal areas however due to their location upgradient and across a major drainage, they cannot be impacted by current mining operations.

### **SURFACE WATER AND GROUND WATER CONDITIONS**

19. Surface drainage from the disposal areas flows about 1,600 feet east into French Gulch and 1,300 feet south into Scorpion Gulch. Scorpion Gulch is tributary to French Gulch. Both are tributary to Clear Creek, which is in turn tributary to Whiskeytown Reservoir. Scorpion Gulch and French Gulch are within the the French Gulch Hydrologic Sub Unit (524.64) in the Clear Creek Hydrologic Area.
20. The Central Valley Water Board adopted a Water Quality Control Plan, Fourth Edition (Revised October 2007), for the Sacramento and San Joaquin River Basins (hereinafter Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. The Basin Plan at page II-2.00 states that the "...beneficial uses of any specifically identified water body generally apply to its tributary streams." The Basin Plan does not specifically identify beneficial uses for Scorpion Gulch or French Gulch, but does identify present and potential uses for Whiskeytown Reservoir, to which Scorpion Gulch and French Gulch, via Upper Clear Creek, are tributary. These beneficial uses are as follows: municipal and domestic supply; agricultural supply, including stock watering; hydropower generation; water contact recreation; non-contact water recreation, including aesthetic enjoyment; warm freshwater habitat; cold freshwater habitat; warm spawning, reproduction, and/or early development; and wildlife habitat.
21. The I-Level Adit is approximately 400 feet below grade surface under the disposal areas and likely behaves as a local groundwater drain fed by fracture flow.
22. Both local surface water and groundwater have impaired beneficial uses as domestic and municipal potable water supplies due to elevated arsenic. The elevated arsenic concentrations likely correlate with long-term local gold mining and may contain a significant natural component. It is unknown exactly what the natural and/or non-point source contribution of arsenic to surface and ground water is. The historic and current mining activity, by

exposing minerals to oxygen and providing drainage from the mine portals, contributes to the soluble metals in the waters. The Central Valley Water Board and BLM are evaluating the natural and portal discharges throughout the watershed to provide additional information on metals loading to surface waters.

23. The point source discharges from existing adits on the Washington Mine property are regulated under a separate NPDES permit (Order No. R5-2010-0052) adopted on 27 May 2010 for discharges to surface waters. These waters can be reasonably treated with Best Practical Control Technology. Therefore, in accordance with State Water Resources Control Board Resolution 88-63, *Sources of Drinking Water Policy*, the Central Valley Water Board finds that local surface water and groundwater have potential beneficial uses as domestic and municipal potable water supplies.

#### **WASTE MANAGEMENT UNIT DESIGN**

24. The Discharger proposes to close the existing unlined mill tailings disposal site and move the existing tailings to a new tailings disposal facility constructed to Title 27 standards for a Group B mining waste. This proposal is appropriate due to current impacts to ground water and surface water (many which are not related to the current mining activities), site conditions-including native geologic materials with open fractures below thin soils, and data showing leachate and/or storm water runoff collected in a pond immediately below the current tailings pile exceeds the water quality objectives for arsenic.
25. Regulations set forth in §22490 Title 27 establish prescriptive standards for construction of waste management units (WMUs) for containment of mining wastes. Engineered alternatives to prescriptive standards may be considered pursuant to §20080 of Title 27 provided the Discharger demonstrates ...“(1) *The construction of the 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.*”
26. The prescriptive liner for a Group B mining waste consists of a single 12 inch compacted clay liner with a maximum permeability of  $1 \times 10^{-6}$  cm/sec. The Discharger proposes an engineered alternative liner system for the Group B mining waste that meets or exceeds the performance standards and provides equivalent or better protection against water quality. The liner design from the bottom up, is as follows: a base layer comprised of compacted and conditioned native soil, a 60-mil, textured on both sides,

high density polyethylene (HDPE) flexible membrane liner, a 270-mil geo-composite drainage layer (base only), and a 2-foot lift of selected mill tailings free of rigid objects. A leachate trench running the length of the WMU will accommodate a 3-inch HDPE perforated pipe, surrounding leach rock, and an 8-ounce non-woven geo-textile, in turn overlain by a blanket leachate collection and recovery system (LCRS) comprised of the geo-composite drainage layer. The LCRS will drain to an above ground tank where the leachate can be removed and processed through the mill and water treatment system. During operations a temporary cover over the tailings during the winter period will reduce the volume of leachate generated.

27. To close the existing tailings disposal site, the Discharger proposes to remove mill tailings over the next four dry seasons, beginning one year after construction of the new tailings Group B WMU.
28. The Discharger proposes three shallow groundwater monitoring wells near the perimeter of the Group B WMU to sample potential perched groundwater in weathered bedrock. Monitoring requirements for these wells is included in the Monitoring and Reporting Program that is a part of this Order.
29. For potential Group B waste rock contained within the existing Group C waste rock disposal facility, the Discharger proposes field screening and segregating for metal sulfide minerals under the direct supervision of a qualified California Professional Geologist. Waste with excessive metal sulfides will go into the Group B WMU. While staff finds the proposal appropriate, such screening may not be sufficient to address documented spraying of mine drainage into the waste rock. Therefore, as part of this Order the Monitoring and Reporting Program will require appropriate further sampling of waste rock.
30. The Group C mine waste disposal area will consist of a graded surface with a series of benches, approximately twelve feet in width, each at 10% slopes counter to local topography. Gabions, drainage pipes, and geo-textile erosion control layers may further stabilize slopes if necessary. Overlying waste rock at final grades range 50% to 40% and roughly parallel underlying native topography.

### **CLOSURE, POST-CLOSURE MAINTENANCE, AND FINANCIAL ASSURANCE**

31. The ROWD includes a preliminary Closure and Post-closure Maintenance Plan for the new Group B WMU. The preliminary closure cap will include, from bottom to top, a minimum 24 inches of smooth-rolled tailings to appropriate slope, a 60-mil HDPE double-textured liner, a 200-mil geocomposite drainage layer, a minimum 12 inches of decomposed porphyry, and 6 to 12 inches of inert, non-mineralized waste rock as an erosion-resistant layer. A preliminary Closure and Post-closure Maintenance Plan for the Group C WMU was not included in the ROWD. This Order contains requirements for the Discharger to provide a cost estimate and submit financial assurances for closure and post-closure maintenance of the Group B and Group C WMUs.
32. On 31 January 2006, French Gulch (Nevada) Mining Company submitted a draft reclamation plan update that, in part, describes mill tailings disposal but not specifically the proposed Group B WMU. In order to comply with the Surface Mining And Reclamation Act, the Shasta County Planning Commission will require the an update of the current reclamation plan to reflect the proposed operations.

### **CEQA CONSIDERATIONS**

33. On 23 August 1996, the Planning Commission of Shasta County adopted Resolution Number 97-016, a mitigated negative declaration of a proposed reclamation plan for Assessors' Parcel Numbers 046-340-002 and 046-340-003. The related Initial Study and Reclamation Plan described, in part, the disposal of mill tailings and waste rock.

### **OTHER LEGAL REFERENCES**

34. This Order incorporates and implements:
- a. Fourth Edition of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin Basins;
  - 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; and



- c. State Water Resources Control Board Resolution No. 88-63 – the Sources of Drinking Water Policy

35. Section 13267(b) of the California Water Code provides: *“In conducting an investigation specified in subdivision (a), the Regional Board may require that any person who has discharged, discharges, or is suspected of discharging, or who proposed to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who had discharged, discharges, or is suspected of discharging, or who proposed to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports.”*
36. The monitoring and reporting program required by this Order (Monitoring and Reporting Program No. R5-2011-0026, attached) is necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges the waste subject to this Order.

### **PROCEDURAL REQUIREMENTS**

37. 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.
38. All of the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, were considered in establishing the following conditions of discharge.
39. The Central Valley Water 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 public hearing and an opportunity to submit their written views and recommendations.
40. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.
41. Any person affected by this action of the Central Valley Water Board may petition the State Water Resources Control Board to review the action in accordance with Sections 2050 through 2068, Title 23, California Code of Regulations. The petition must be received by the State Water Resources

Control Board, Office of Chief Counsel, P.O. Box 100, Sacramento, California 95812, within 30 days of the date of issuance of this Order. Copies of the laws and regulations applicable to the filing of a petition are available on the Internet at [http://www.waterboards.ca.gov/water\\_laws/index.html](http://www.waterboards.ca.gov/water_laws/index.html) and will be provided on request.

IT IS HEREBY ORDERED, pursuant to Sections 13263 and 13267 of the California Water Code, that Order No. 96-289 be rescinded, and that Shasta Gold Corporation and French Gulch (Nevada) Mining Corporation, their agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

#### **A. PROHIBITIONS**

1. The discharge of "hazardous waste" or "Group A" mining waste at this facility prohibited. For the purposes of this Order, the terms "hazardous waste", "Group A", "Group B", and "Group C" mining wastes are as defined in Title 27.
2. The discharge of any waste other than mining wastes into the WMUs is prohibited. Prohibited wastes may include, but are not limited to, oil, grease, solvents, other petroleum products, and toxic and hazardous materials.
3. The discharge of wastes outside of a WMU or portions of a WMU specifically designed for their containment is prohibited except as otherwise permitted under additional Central Valley Water Board orders.
4. The discharge of mine drainage into a WMU is prohibited.
5. The discharge of mill tailings to the unlined tailings disposal area beyond one year from the date of adoption of this Order is prohibited.

#### **B. DISCHARGE SPECIFICATIONS**

##### General Specifications

6. Wastes shall only be discharged into, and shall be confined to, the WMU specifically designed for their containment.

7. The Discharger shall not cause a condition of pollution, contamination, or nuisance as defined by §13050 of the California Water Code.
8. The existing unlined mill tailings disposal area will be closed within four years of the adoption of this Order.

#### WMU Construction

9. All work shall be performed under the direct supervision of a California Professional Civil Engineer or Certified Engineering Geologist.
10. The Discharger may construct the lined Group B WMU in increments as needed to contain the volume of tailings predicted to be generated over the next one or two years.
11. The Group B WMU liner system shall consist of, from the bottom up:
  - a. an engineered subgrade comprised of moisture conditioned native soil, compacted to a minimum 90 percent of maximum dry density, and smooth rolled,
  - b. a 60 mil, textured on both sides, HDPE flexible membrane liner,
  - c. a 270 mil geocomposite drainage layer on the bottom of the WMU,
  - d. two feet of selected mill tailings free of rigid objects or other items which may penetrate the underlying liner system
12. Materials used to construct the liners shall have appropriate physical and chemical properties to ensure containment of the discharged wastes over the operating life, closure, and post-closure maintenance period of the WMU.
13. The Group B WMU shall be constructed to withstand earthquakes with a ground acceleration of 0.22 g, that acceleration that is predicted from the Maximum Credible Earthquake.
14. All leachate and contact water (that precipitation that has fallen on, but not infiltrated through the tailings) derived from the Group B WMU shall be drained and captured in an appropriate lined leachate collection and recovery system (LCRS). The LCRS shall be constructed of materials with appropriate physical and chemical properties to ensure containment of discharged wastes and required transmission of leachate over the

operating life, closure, and post-closure maintenance period of the Group WMU.

15. Leachate will be collected in the geocomposite drainage layer and directed to a trench in the bottom of the unit containing a three inch HDPE perforated pipe. Leachate from the pipe will be collected in an above ground tank where it will be periodically removed and returned to the mill and used in the milling process.
16. The LCRS shall be designed, constructed, and maintained to collect twice the anticipated daily volume of leachate generated by the Group B WMU and to prevent the buildup of hydraulic head on the underlying liner at any time.
17. Leachate generated shall not exceed design requirements for the Group B WMU. If leachate exceeds design requirements, the Discharger shall immediately cease the discharge of waste, and shall notify the Central Valley Water Board **within seven days**. Notification shall include a time schedule for appropriate remedial action to repair the WMU or otherwise control leachate.
18. The Group C WMU shall be constructed to assure slopes will not fail during ground acceleration of 0.14g, that acceleration expected from the Maximum Probable Earthquake.
19. Wastes shall be placed in the Group C WMU in a manner that reduces erosion and controls drainage to prevent the discharge of sediment to surface waters.

#### Protection from Storm Events

20. For the WMUs, and related excavation and grading operations, all precipitation and drainage control systems shall be designed, constructed, and maintained to accommodate the anticipated volume of precipitation and peak flows from surface run-off under 25-year, 24-hour precipitation.
21. The Discharger currently is covered by State Water Resources Control Board Order No. No. 97-03-DWQ, *General Permit for Discharges of Storm Water Associated with Industrial Activities*. To comply with federal regulations for storm water discharges promulgated by U.S. EPA, the Discharger shall continue to maintain and comply with Order No. 97-03-DWQ. If the area of un-reclaimed land or un-stabilized land for construction of the WMU exceeds 1 acre at any given time, the Discharger shall seek coverage under the State Water Resources Control Board

Order No. 2009-0009 DWQ, *General Permit for Discharges of Storm Water Associated with Construction Activity*, and shall conduct the monitoring and reporting as required therein.

22. Annually, prior to the anticipated wet season, any necessary erosion control measured shall be implemented, and any necessary construction, maintenance, or repairs of precipitation and drainage controls shall be completed to prevent flooding, erosion, or slope failure.

#### WMU Closure

23. The closure of the WMU shall be under the direct supervision of a California Professional Civil Engineer or Certified Engineering Geologist.
24. The final closure cap on the Group B WMU shall be comprised, from the bottom up, of:
- a. a minimum 24 inches of mill tailings, smooth-drum rolled and sloped to no less than 3 percent and no more than 3 to 1 grade,
  - b. a 60 mil, textured on both sides, HDPE flexible membrane liner,
  - c. a 200 mil geocomposite drainage layer
  - d. a minimum 12 inches of decomposed native porphyry
  - e. 6 to 12 inches of inert, non-mineralized waste rock as an erosion-resistant layer or other erosion-resistant layer approved by the Executive Officer
25. A preliminary Closure and Post-closure maintenance Plan for the Group C WMU shall be submitted **within one year of the adoption of this Order**. The Group C WMU shall be closed in a manner that reduces the potential for erosion and sediment transport to surface waters including an erosion resistant cover and storm water drainage facilities.
26. The ROWD contained a description of the closure of the unlined tailings disposal area, referred to as WMU No. 2 in Order No. 96-289. Non-mineralized waste rock which may exist within the current tailings disposal area and upon testing approved by the Executive Officer, is classified as a Group C mining waste will be pushed down-slope to the existing waste rock disposal area. Following removal of the existing Group B mining waste, the Discharger will collect appropriate confirmation soil samples for comparison with local background.

### C. GROUNDWATER LIMITATIONS

27. Neither construction of, discharge of waste into, closure of, nor post-closure maintenance of, the WMUs shall cause or allow groundwater to be degraded.
28. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, and in accordance with Monitoring and Reporting Program No. R5-20011-0026. **Within 90 days of adoption of this Order**, the Discharger shall submit a workplan for installation of a detection monitoring program for the Group B and Group C WMUs. The wells shall be installed **prior to the discharge of waste to the Group B WMU**. The monitoring system for the Group B WMU shall include, at a minimum, three ground water monitoring wells, one of which is capable of obtaining ground water samples unaffected by mining waste disposal from either the Group B WMU, Group C WMU, or the unlined tailings disposal area. A minimum of two monitoring wells shall be installed downgradient of the Group B WMU and a minimum of one monitoring well downgradient of the Group C WMU. The final monitoring system will be comprised of a total of at least four wells.
29. The Discharger shall provide Regional Water Board staff a minimum of **one week** notification prior to commencing any field activities related to the installation, repair, or abandonment of monitoring devices.
30. The Discharger shall comply with the Water Quality Protection Standard as specified in this Order, Monitoring and Reporting Program No. R5-2011-0026, and *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 (Standard Provisions) which are hereby incorporated into this Order.
31. The Discharger shall submit a Water Quality Protection Standard Report within **two years** of adoption of this Order. The Water Quality Protection Standard Report shall include the information described in Section C 1 **Water Quality Protection Standard and Compliance Period, Water Quality Protection Standard Report** of the attached Monitoring and Reporting Program No. R5-2011-0026
32. The Water Quality Protection Standard for organic compounds that are not naturally occurring and not detected in background groundwater samples

shall be taken as the detection limit of the analytical method used (i.e., U.S. EPA methods 8260B and 8270). The repeated detection of one or more non-naturally occurring organic compounds in samples above the Water Quality Protection Standard from detection monitoring wells is potential evidence of a release from the facility.

33. 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.R5-2011-0026.
34. For each monitoring event, the Discharger shall determine whether the facility is in compliance with the Water Quality Protection Standard using procedures specified in Monitoring and Reporting Program No.R5-2011-0026 and Title 27 §20415(e).
35. The Discharger shall maintain an approved Sample Collection and Analysis Plan. The Sample Collection and Analysis Plan shall at a minimum include:
  - Sample collection procedures describing purging techniques, sampling equipment, and decontamination of sampling equipment;
  - Sample preservation information and shipment procedures;
  - Sample analytical methods and procedures;
  - Sample quality assurance/quality control (QA/QC) procedures; and
  - Chain of Custody control.

#### **D. FINANCIAL ASSURANCE**

36. The Discharger shall update their financial assurances for closure, and post-closure maintenance of the site to include the Group B WMU by **30 April 2012**. Submittal of a Reclamation Plan and financial assurances to the Shasta County Department of Resource Management, Planning Division and the California Department of Conservation, Office of Mine Reclamation as required by the Surface Mining and Reclamation Act shall generally be adequate to meet this requirement. The Discharger shall adjust the costs annually to account for inflation and any changes in facility design, construction, or operation.

37. Prior to discharge of mine waste into the Group B WMU and thereafter by **30 August of each year**, the Discharger shall submit updated cost estimates and a demonstration of assurances of financial responsibility for initiating and completing *corrective action for all known or reasonably foreseeable releases* from the Group B and Group C WMUs and mill. Financial assurances are already required for closure and corrective action for discharges from the underground workings in Order No. R5-2010-0052 which regulates discharges from the mine portals. The Discharger shall provide the assurances of financial responsibility as required by Title 27, Division 2, Subdivision 1, Chapter 6. The assurances of financial responsibility shall provide that funds for corrective action shall be available to the Central Valley Water 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 that may affect the reasonably foreseeable releases.

## E. PROVISIONS

38. The Discharger shall comply 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 (Standard Provisions) which are hereby incorporated into this Order. The Standard Provisions contain important provisions and requirements with which the Discharger must comply. A violation of any of the Standard Provisions and Reporting Requirements is a violation of these waste discharge requirements.

39. The Discharger must comply with Monitoring and Reporting Requirements Order No. R5-2011-\_\_\_\_\_, which is attached herein and made part of this Order. Compliance includes, but is not limited to, monitoring of waste, surface water and groundwater throughout the active life of the WMU and post-closure maintenance period. A violation of Monitoring and Reporting Requirements No. R5-2011-\_\_\_\_\_ is a violation of this Order.

40. The Discharger shall notify Central Valley Water Board staff **within 24 hours** of any discharge, flooding, equipment failure, slope failure, or other change in site conditions that would impair closure of the existing mill tailings disposal area, construction, operation or monitoring of the Group B WMU, or related precipitation and drainage controls.

41. The Discharger shall maintain legible records at the facility of volume and type of waste discharged to the WMUs. The Discharger shall make such records available for review by representatives of the Central Valley Water



Board and State Water Resources Control Board until the beginning of the post-closure maintenance period.

42. Within **six months of the adoption of this Order**, the Discharger shall submit for approval of the Executive Officer a Sampling and Analyses plan to monitor and characterize the waste rock to allow for determination if the waste rock is classified as a Group B or Group C waste. This program will be an on-going program for as long as waste rock is produced at the site.

43. The Discharger shall complete the following tasks by the required dates:

<b>TASK</b>	<b>DATE DUE</b>
Submit workplan for installation of a ground water detection monitoring system for the Group B and Group C WMUs.	<b>Within 90 days of adoption of this Order</b>
Installation of a ground water detection monitoring system for the Group B and Group C WMUs	<b>Prior to discharge of waste into the Group B WMU</b>
Submit Sampling and Analyses Plan for monitoring and characterizing waste rock as Group B or Group C waste.	<b>Within six months of adoption of this Order.</b>
Submit cost estimates and financial assurances for closure and post-closure maintenance to include the Group B WMU.	<b>By 30 April 2012</b>
Submit updated financial assurances for corrective action for cleanup of foreseeable releases from the Group B and Group C WMUs and mill area.	<b>By 3 August of each year</b>
Submit Water Quality Protection Standard Report	<b>Within two years of adoption of this Order</b>
Remove existing tailings from current disposal area and place in Group B WMU	<b>April 2015</b>

44. The Discharger shall provide proof to the Central Valley Water Board **within sixty days after completing final closure** that appropriate documents on file at the County Recorder's Office will notify a potential

land purchaser that the property contains WMUs with Group B and Group C mining wastes, land-use options are restricted in accordance with a post-closure maintenance plan, and in the event that the Discharger defaults on either the post-closure maintenance plan or any corrective actions, responsibility for carrying out such work would fall on the current property owner.

45. In the event of any change in control or ownership of the Washington Mine complex, the Discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Central Valley Water Board Redding Office. To assume operation as a Discharger under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name, address, and telephone number of persons responsible for contact with the Central Valley Water Board, and a statement complying with the signatory paragraph of the Standard Provisions that states 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 shall be approved or disapproved by the Executive Officer.
46. For the purposes of resolving any disputes arising from or related to the California Water Code, any regulations promulgated thereunder, these WDRs or any other orders governing this site, the Discharger, its parents and subsidiaries, and their respective past, present, and future officers, directors, employees, agents, shareholders, predecessors, successors, assigns, and affiliated entities, consent to jurisdiction of the Courts of the State of California.
47. The Central Valley Water Board will review this Order periodically and revise requirements when necessary.

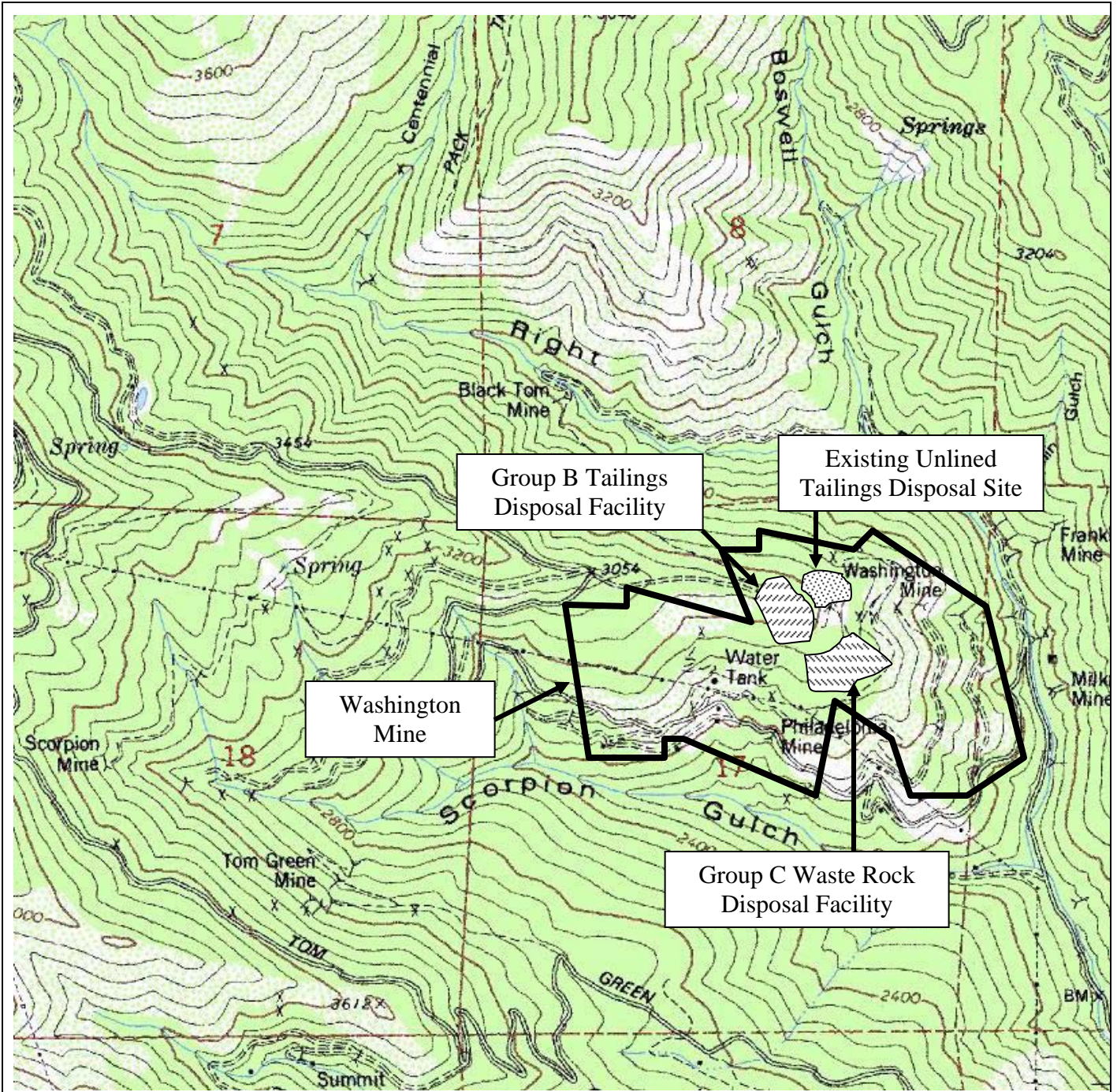
I, Pamela C. Creedon, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the Central Valley Regional Water Quality Control Board, on 8 April 2011.

***original signed by***

\_\_\_\_\_  
PAMELA C. CREEDON, Executive Officer

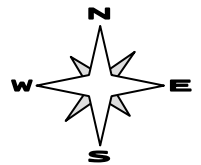
EJR/PVW

**ATTACHMENT A**



Drawing Reference:  
**FRENCH GULCH, CALIF.**  
 U.S.G.S TOPOGRAPHIC MAP  
 7.5 MINUTE QUADRANGLE  
 1979

**SITE LOCATION MAP**  
 SHASTA GOLD CORP, FRENCH GULCH (NEVADA)  
 MINING CORP,  
 MILL TAILINGS AND WASTE ROCK DISPOSAL  
 FACILITIES  
 WASHINGTON MINE



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2011-0026  
FOR

SHASTA GOLD CORPORATION  
AND  
FRENCH GULCH (NEVADA) MINING CORPORATION

TAILINGS AND WASTE ROCK DISPOSAL FACILITIES  
WASHINGTON MINE  
SHASTA COUNTY

Pursuant to Section 13267 of the California Water Code, the Discharger shall comply with this Monitoring and Reporting Program (MRP), and with the companion *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 (Standard Provisions), as ordered by Waste Discharge Requirements (WDRs) Order No. R5-2011-0026. Failure to comply with this MRP, or with the Standard Provisions, constitutes noncompliance with the WDRs and with the Water Code, which can result in the imposition of civil monetary liability. The Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Executive Officer.

#### **A. REPORTING**

The Discharger shall submit quarterly monitoring reports with the data and information required in this MRP and as required the Standard Provisions and Order No. R5-2011-0026. Reports that 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.

Method detection limits (MDLs) and practical quantitation limits (PQLs) shall be reported. All peaks shall be reported, including those that cannot be quantified or specifically identified. Field and laboratory tests shall be reported in the quarterly monitoring reports. The results of any monitoring done more frequently than required at the locations specified herein shall be reported to the Central Valley Water Board.

## **B. REQUIRED MONITORING REPORTS AND SUBMITTAL DATES**

### **1. Quarterly Monitoring Reports**

All Quarterly Monitoring Reports shall include all water quality data and observations collected during the reporting period and submitted per the **Reporting Due Date** in Section B.6 of this Monitoring and Reporting Program. At a minimum, the sampling and data collection required in Section D of this Monitoring and Reporting Program, as well as in the Standard Provisions and WDRs shall be reported.

### **2. Annual Monitoring Report**

The Discharger shall submit an Annual Monitoring Report to the Regional Water Board covering the previous monitoring year. The annual report shall contain the information specified in Standard Provisions, Section VIII.B, "*Reports to be Filed to the Board.*"

### **3. Facility Monitoring Report**

Annually, prior to the anticipated rainy season, **but no later than 30 September**, the Discharger shall conduct an inspection of the facility. The inspection shall assess damage to the Waste Management Units (WMUs), precipitation and drainage control systems, and groundwater monitoring wells, and shall include the Standard Observations contained in Section XII.S of the Standard Provisions.

### **4. Response to a Release**

If the Discharger determines that there is statistical evidence of a release (i.e., the initial comparison or non-statistical comparison indicates, for any Constituent of Concern or Monitoring Parameter, that a release is tentatively identified), the Discharger shall **immediately** notify the Regional Water Board verbally as to the Monitoring Point(s) and constituent(s) or parameters(s) involved, shall provide written notification by certified mail **within seven days** of such determination and shall implement the Response to Release section of the Standard Provisions.

### **5. Water Quality Protection Standard Report**

For any proposed changes in a statistical method or concentration limits for a constituent of concern or monitoring parameter, a Water Quality Protection Standard Report shall be submitted and include information required in Section C.1 of this Monitoring Reporting Program. Any changes to Water Quality

Protection Standards shall be approved by the Executive Officer in a Revised Monitoring and Reporting Program.

**6. Submittal Dates**

The Discharger shall submit reports to the Regional Water Board Redding Office at the schedule shown in the following table:

**Table B1, Report Submittal Dates**

<b>Reporting Type</b>	<b>Sampling Frequency and Data Reported</b>	<b>Reporting Period</b>	<b>Report Due Date</b>
Quarterly	Daily, Weekly, Monthly, and Quarterly	1 January-31 March 1 April – 30 June 1 July – 30 September 1 October – 31 December	<b>30 April</b> <b>31 July</b> <b>31 October</b> <b>31 January</b>
Annual Summary	All data from Quarterly Reports	1 January – 31 December	<b>31 January</b>
Facility Monitoring Report	As required in Standard Provisions and Reporting Requirements		<b>15 November</b>
Response to a Release	As required in Standard Provisions and Reporting Requirements		<b>As necessary</b>
Water Quality Protection Standard Report			<b>As necessary</b>

**C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD**

**1. Water Quality Protection Standard Report**

For the Group B and Group C WMUs, 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 for each monitored medium.

The Water Quality Protection Standard for naturally occurring waste constituents consists of the constituents of concern, the concentration limits, and the point of compliance and all monitoring points. The Water Quality Protection Standard, or any modification thereto, shall be submitted in a report for review and approval.

The report shall:

- a. Identify **all distinct bodies of surface water and groundwater** that could be affected in the event of a release from the WMU or portion thereof. 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 groundwater 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).

The Water Quality Protection Standard shall be certified by a California Professional Civil Engineer or Certified Engineering Geologist as meeting the requirements of Title 27 CCR. 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 Group B WMU. The constituents of concern are those listed in Table D-2. The Discharger shall monitor all constituents of concern at the frequencies listed in Table D-2.

### **a. 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 for all Units are those listed in Table D-2.

#### **b. Concentration Limits**

For a naturally occurring constituent of concern, the concentration limit for each constituent of concern shall be determined as follows:

- By calculation in accordance with a statistical method pursuant to §20415 of Title 27(e)(8); or
- By an alternate statistical method meeting the requirements of §20415(e)(8)(E) of Title 27.

#### **4. Point of Compliance**

The point of compliance for the water standard at the Group B WMU is a vertical surface located at the hydraulically down-gradient limit of a unit of interest that extends through the uppermost water bearing zone underlying the unit. For the purposes of this MRP, the uppermost water bearing zone may be considered as perched groundwater in colluvium near its contact with underlying bedrock beneath the existing mill tailings and Group C waste rock disposal areas, and the new Group B WMU. However, because insufficient free seepage may occur in colluvium to allow sampling in monitoring wells, the uppermost water bearing zone may also be considered as seepage within the I-Level Adit as encountered beneath these areas.

#### **5. Compliance Period**

The compliance period shall be the number of years equal to the active life of the Group B plus the post-closure maintenance 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 Group B WMU. The compliance period shall begin anew each time the Discharger initiates an evaluation monitoring program.

### **D. MONITORING**

The Discharger shall comply with the monitoring program provisions of Title 27 for waste discharge and groundwater in accordance with the Standard Provisions. **Prior to** the discharge of waste into the Group B WMU, the Discharger shall install a network of monitoring wells that are appropriate for detecting, at the earliest time possible, a release from the existing mill tailings and Group C waste rock disposal areas and the Group B WMU, and that comply with applicable provisions of §20415, Title 27. Based both on the monitoring wells and relevant data from local mine drainage, if applicable, the Discharger



shall establish background concentrations for Constituents of Concern and monitoring parameters pursuant to §20395 and §20415(e)(10) and submit a Sample Collection and Analysis Plan for groundwater monitoring that is acceptable to the Executive Officer. The plan should include appropriate field sampling methods, and quality assurance and quality controls.

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, and leachate shall be sampled and analyzed for monitoring parameters and constituents of concern as indicated and listed in Tables D-2 and D-3.

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. Specific metals shall be analyzed in accordance with the methods listed in Table D-3.

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. Waste Discharge Monitoring

The Discharger shall monitor all wastes discharged to the Group B and Group C WMUs on a monthly basis and report the results in the quarterly Monitoring Reports as shown in the following table:

**Table D.1. Waste Discharge Monitoring**

Parameters	Units	Frequency
Quantity of waste deposited	Cubic yards	Monthly
Quantity of Group B Waste Rock	Cubic yards	Monthly
Remaining Capacity	Cubic yards	Monthly

## 2. Groundwater Monitoring

The Discharger shall operate and maintain a groundwater monitoring system that complies with the applicable provisions of §20415 of Title 27 in accordance with a 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.

For each sampling event, Discharger shall determine the groundwater flow rate and direction in the uppermost water bearing zone, as defined herein in Section C.4, and identify times of highest and lowest elevations of water levels in monitoring wells, and peak-flows and base-flows in the I-Level adit. Hydrographs from wells and appropriate stations in I-Level adit shall be prepared quarterly and reported semi-annually.

Groundwater samples shall also be evaluated each reporting period with regards to cation/anion balance, and the results shall be graphically presented on appropriate Piper, Stiff, or Schoeller Diagrams. The following tables show required field and monitoring parameters, constituents of concern, and required monitoring frequencies:

**Table D-2. Field and Monitoring Parameters**

Parameter	Units	Frequency
<b>Field Parameters:</b>		
Static Water Level	Feet above mean sea level	Quarterly <sup>1</sup>
Temperature	°C	Quarterly <sup>1</sup>
Electrical Conductivity (EC)	µmhos/cm	Quarterly <sup>1</sup>
pH	pH units	Quarterly <sup>1</sup>
Methylene Blue Active Substances (MBAS)	mg/l	Quarterly <sup>1</sup>
Turbidity	Nephelometric turbidity units	Quarterly <sup>1</sup>
<b>Monitoring Parameters:</b>		
Total Dissolved Solids (TDS)	mg/l	Quarterly <sup>1</sup>
Carbonate	mg/L	Quarterly <sup>1</sup>
Bicarbonate	mg/L	Quarterly <sup>1</sup>
Chloride	mg/L	Quarterly <sup>1</sup>
Nitrate-Nitrogen	mg/L	Quarterly <sup>1</sup>
Sulfate	mg/L	Quarterly <sup>1</sup>
Sulfide	mg/L	Quarterly <sup>1</sup>
Calcium	mg/L	Quarterly <sup>1</sup>
Magnesium	mg/L	Quarterly <sup>1</sup>
Potassium	mg/L	Quarterly <sup>1</sup>
Sodium	mg/L	Quarterly <sup>1</sup>

Iron	mg/L	Quarterly <sup>1</sup>
Manganese	mg/L	Quarterly <sup>1</sup>
Aluminum	mg/L	Quarterly <sup>1</sup>
Heavy Metals <sup>2</sup>	mg/L	Quarterly <sup>1</sup>

<sup>1</sup>Samples shall be collected and analyzed on a quarterly basis for two years and semi-annually thereafter.

<sup>2</sup>Heavy Metals shall constitute the list of metals contained in Table D-3.

**Table D-3. Constituents of Concern**

Dissolved Constituent:	USEPA Method:
Antimony	7041
Arsenic	7062
Beryllium	6010
Cadmium	7131A
Chromium	6010
Cobalt	6010
Copper	6010
Lead	7421
Mercury	7470A
Molybdenum	7480
Nickel	7521
Silver	6010
Vanadium	6010
Zinc	6010
Sulfide	9030B

### 3. Leachate Monitoring

The above ground leachate collection tank at the Group B WMU shall be inspected monthly for leachate generation. Upon detection of leachate in a previously dry collection tank, leachate shall be sampled **immediately** and analyzed for the field and monitoring parameters, and constituents of concern listed in Tables D-2 and D-3. The volume of leachate removed from the tank shall be measured each time the tank is emptied and the total volume reported quarterly.

Leachate that seeps to the surface from the Group B or Group C WMU shall be sampled **immediately** and analyzed for the Monitoring Parameters and Constituents of Concern listed in Tables D-2 and D-3 upon detection. The quantity of leachate shall be estimated and reported as Leachate Flow Rate (in gallons/day).

#### 4. Tailings and Group B Waste Rock Monitoring

Representative composite samples of tailings and waste rock shall be obtained on a quarterly basis and analyzed as follows:

The acid-base account shall be determined in accordance with the methods described in U.S. EPA Publication 600/2-78/054 (Sobek et. al. 1978) or by alternative methods approved by the Executive Officer. The acid-base account shall consist of neutralization potential and maximum potential acidity by total sulfur determination.

The heavy metals listed in Table D-3 shall be determined by the WET procedure described CCR, Title 22, §66700. If the acid-base account indicates a net acid-generating potential (AGP), the WET procedure shall use the citrate acid solution as the extracting agent for all metals. If the acid-base account indicates the absence of a net AGP, all metals shall be analyzed using de-ionized water as the extracting agent.

The third quarter sample of each year shall also be analyzed for total metals using nitric acid as the extracting agent regardless of the acid-base account.

After the two years of operations under this Order, the Executive Officer may consider the Discharger's recommendations for alternative sampling frequencies and methods.

#### 5. Facility Monitoring

##### a. Facility Inspection

Annually, prior to the anticipated rainy season, **but no later than 30 September**, the Discharger shall conduct an inspection of the facility. The inspection shall assess damage to the drainage control system and groundwater monitoring equipment, and shall include the Standard Observations described in Standard Provisions. Any necessary construction, maintenance, or repairs shall be completed **by 31 October**. **By 31 January** of each year, the Discharger shall include in the annual report results of the inspection and the repair measures implemented, including photographs of any problems and repairs.

##### b. Storm Events

The Discharger shall inspect all precipitation, diversion, and drainage facilities for damage **within 7 days** following major storm events. 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.

### **E. REPORTING REQUIREMENTS**

The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, 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 throughout the life of the facility including the post-closure maintenance period.

The Discharger shall implement the above monitoring program on the effective date of this Order. The transmittal letter accompanying monitoring reports submitted under this Order shall, as required under the Standard Provisions (*Provision 5, General Requirements*, REPORTING REQUIREMENTS), contain a statement by the Discharger, or the Discharger's authorized agent, under penalty of perjury, that to the best of the signer's knowledge, the report is, true, accurate, and complete.

***original signed by***

Ordered by:

\_\_\_\_\_  
PAMELA C. CREEDON,  
Executive Officer

\_\_\_\_\_  
8 April 2011

(Date)

EJR/PVW:

## INFORMATION SHEET

Shasta Gold Corporation and its subsidiary, French Gulch (Nevada) Mining Corporation, submitted a Report of Waste Discharge dated 20 September 2009 for a revision of waste discharge requirements for the land disposal of solid waste from the Washington Mine. The facility is an existing underground gold mine which has been in sporadic operation since 1852.

The Washington Mine complex is comprised of patented and unpatented claims covering 1825 acres approximately 2 miles west of the community of French Gulch, Shasta County. The unpatented land is administered by the Department of Interior, Bureau of Land Management.

Ore and waste rock are removed from the underground mine with waste rock being placed in a designated disposal area. Ore is processed through a mill where the particle size is reduced and gold is separated with gravity jigs and finally through flotation cells. In the flotation cells, chemical reagents are added to allow the gold bearing particles to adhere or "float" on bubbles and are skimmed from the processing solution, which is recycled through the mineral recovery system. The spent material is dried through a filter screen and the resulting tailings are stockpiled adjacent to the mill until they can be transported to the tailings disposal facility. Reagents used in the mill include copper sulfate, methyl isobutyl carbinol, and potassium xanthate.

### Waste Characterization

The mill tailings are fine grained, dense, cohesive, and of low permeability. Analyses of the tailings has shown they contain significant arsenic, on occasion exceeding the hazardous waste criteria of 500 mg/kg. However, data shows the tailings have little or no acid generating potential with a neutralization potential to acid generation potential ratio well above 3. Analyses of the tailings using distilled water as the extractant, simulating rainfall, shows arsenic in the leachate below 1 mg/l. Based on this information the mill tailings are classified as a Group B mining waste.

Waste rock from the mine, that rock which does not contain economic concentrations of minerals, can still be highly mineralized and contain concentrations of waste constituents, mainly arsenic, that exceed the hazardous waste criteria of 500 mg/kg. The waste rock is commonly larger grained than the tailings. Most of the waste rock is non-mineralized. Mineralized waste rock with arsenic concentrations exceeding 10 mg/kg is classified as a Group B mine waste. Title 27 defines Group B mine waste as "*wastes that consist of or contain*

*hazardous wastes that qualify for a variance under Title 22 CCR, provided Regional Water Board staff finds that such mining wastes pose a low threat to water quality; or mining wastes that consist of or contain non-hazardous soluble pollutants of concentrations that exceed water quality objectives (WQOs) for, or could cause, degradation of waters of the state.”*

Non-mineralized waste rock, that is waste rock with that contains low, non-soluble concentrations of heavy metals is classified as a Group C mining waste. Title 27 defines Group C mine waste as “*wastes from any discharge that would be in compliance with the applicable water quality control plan, including WQOs other than turbidity.*”

To distinguish between Group B and Group C waste rock, monitoring of the waste rock is required as part of the Monitoring and Reporting Program attached to this Order.

#### Background Water Quality

Since 2006, Regional Board staff has collected data on water discharging from 7 mine portals in the area and from two adjacent streams: Scorpion Gulch and French Gulch. The mine portal discharges contain elevated concentrations of naturally occurring heavy metals including concentrations of arsenic up to 7,750 µg/l. The streams contain arsenic concentrations up to 34 µg/l and 20 µg/l in Scorpion Gulch and French Gulch, respectively downstream of the mine. The USEPA and California Department of Health Services Primary Maximum Contaminate Limit for drinking water is 10 µg/L for arsenic. Since the beneficial uses for French Gulch and Scorpion Gulch include domestic drinking water supply, these watercourses do not currently meet the assigned beneficial uses.

The disposal of tailings at the mine was previously regulated by Order No 96-289 which allowed for the disposal of mine tailings into unlined ponds on an unpatented claim administered by the BLM and subsequently to a designated unlined disposal area where they are subject to infiltration of precipitation. Runoff and/or seepage from the tailings is collected in an unlined pond and is periodically collected and returned to the mill for use in the mineral recovery circuit. Order No. 96-289 and the current operations are inconsistent with regulations and policies for regulation of mining waste, does not reflect actual operations and discharges, and is not adequately protective of water quality and the assigned beneficial uses.

Waste Discharge Requirements Order No. R5-2010-0052 (NPDES Permit No. CA0085294), adopted on 27 May 2010, includes requirements to collect and

treat drainage from the mine portals prior to discharge to surface waters. Order No. R5-2010-0052, along with these revised Waste Discharge Requirements for the disposal of tailings and waste rock, will help reduce the metal loading, including arsenic, to surface waters.

### Waste Containment

This Order requires the Discharge to construct a disposal facility to contain the mine tailings which are classified as Group B mine wastes. The prescriptive liner for a Group B mining waste described in Title 27 of the California Code of Regulations consists of a single 12 inch compacted clay liner with a maximum permeability of  $1 \times 10^{-6}$  cm/sec. The Discharger proposes an engineered alternative liner system for the Group B mining waste that meets or exceeds the performance standards and provides equivalent or better protection against water quality. The liner design from the bottom up, is as follows: a base layer comprised of compacted and conditioned native soil, a 60-mil, textured on both sides, high density polyethylene (HDPE) flexible membrane liner, a 270-mil geo-composite drainage layer (base only), and a 2-foot lift of selected mill tailings free of rigid objects. A leachate trench running the length of the WMU will accommodate a 3-inch HDPE perforated pipe, surrounding leach rock, and an 8-ounce non-woven geo-textile, in turn overlain by a blanket leachate collection and recovery system (LCRS) comprised of the geo-composite drainage layer. The LCRS will drain to a collection sump where the leachate can be removed and processed through the mill and water treatment system. The LCRS sump will have an underlying leak detection sump. During operations a temporary cover over the tailings during the winter period will reduce the volume of leachate generated.

The existing unlined tailings disposal facility will be closed and the existing and new tailings placed in the Group B disposal facility.

Waste rock that does not contain chemical or mineral constituents that may impact water quality will be placed in a Group C mine waste disposal area. The wastes currently placed in the Group C disposal area may contain highly mineralized wastes that have the potential to leach soluble constituents, including heavy metals into ground or surface waters. This Order requires the Discharger to sample and segregate Group B wastes from Group C wastes and place the Group B wastes into the Group B disposal facility.

### Water Quality Protection Standards

Water quality protection standards per Title 27 have not been established for either of the waste management units. This Order requires water quality



SHASTA GOLD CORPORATION AND  
FRENCH GULCH (NEVADA) MINING CORPORATION  
TAILINGS AND WASTE ROCK DISPOSAL FACILITIES  
WASHINGTON MINE, SHASTA COUNTY

protection standards be established within two years after adoption of this Order and will consist of the list of constituents of concern (under section 20395), the concentration limits (under Title 27 section 20400), and the Point of Compliance and all Monitoring Points (under section 20405). This Water Standard will apply during the active life of the Units, the closure period, the post closure maintenance period, and during any compliance period (under section 20410). Furthermore, these values will represent background water quality for groundwater.

PVW: