

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2006-0058
NPDES NO. CA0085171

WASTE DISCHARGE REQUIREMENTS
FOR
STATE OF CALIFORNIA
DEPARTMENT OF PARKS AND RECREATION
EMPIRE MINE STATE HISTORIC PARK
NEVADA COUNTY

The following Discharger is subject to waste discharge requirements as set forth in this Order:

Discharger	State of California, Department of Parks and Recreation
Name of Facility	Empire Mine State Historic Park
Facility Address	10556 East Empire Street
	Grass Valley, CA 95945
	Nevada County

The discharge by the State of California, Department of Parks and Recreation, from the discharge point identified below is subject to waste discharge requirements as set forth in this Order:

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
EFF-001	Mine Drainage	39°, 12', 40.4" N	121°, 03', 06.6" W	Unnamed Tributary to South Fork of Wolf Creek

This Order was adopted by the Regional Water Board on:	23 June 2006
This Order shall become effective on:	1 August 2006
This Order shall expire on:	31 July 2011
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Board have classified this discharge as a minor discharge.	
The Discharger shall file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, <u>not later than 180 days in advance of the Order expiration date</u> as application for issuance of new waste discharge requirements.	

IT IS HEREBY ORDERED, that in order to meet the provisions contained in Division 7 of the California Water Code (CWC) and regulations adopted thereunder and the provisions of the federal Clean Water Act (CWA), and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 23 June 2006.

PAMELA C. CREEDON, Executive Officer

TABLE OF CONTENTS

I.	Facility Information	3
II.	Findings.....	3
III.	Discharge Prohibitions.....	8
IV.	Effluent Limitations and Discharge Specifications	9
	A. Effluent Limitations – Discharge Point EFF-001.....	9
	B. Land Discharge Specifications— <i>Not Applicable</i>	10
	C. Reclamation Specifications— <i>Not Applicable</i>	10
V.	Receiving Water Limitations	11
	A. Surface Water Limitations.....	11
	B. Groundwater Limitations— <i>Not Applicable</i>	13
VI.	Provisions.....	13
	A. Standard Provisions.....	13
	B. Monitoring and Reporting Program Requirements	17
	C. Special Provisions	18
	1. Reopener Provisions	18
	2. Special Studies, Technical Reports and Additional Monitoring Requirements	19
	3. Best Management Practices and Pollution Prevention— <i>Not Applicable</i>	20
	4. Construction, Operation and Maintenance Specifications.....	20
	5. Special Provisions for Municipal Facilities (POTWs Only)— <i>Not Applicable</i>	21
	6. Other Special Provisions.....	21
	7. Compliance Schedules.....	22
VII.	Compliance Determination	23
	Attachment A – Definitions	A-1
	Attachment B – Topographic Map	B-1
	Attachment C – Flow Schematic	C-1
	Attachment D – Federal Standard Provisions.....	D-1
	Attachment E – Monitoring and Reporting Program (MRP).....	E-1
	Attachment F – Fact Sheet.....	F-1
	Attachment G – Constituent Study.....	G-1

I. FACILITY INFORMATION

The following Discharger is subject to waste discharge requirements as set forth in this Order:

Discharger	State of California, Department of Parks and Recreation
Name of Facility	Empire Mine State Historic Park
Facility Address	10556 East Empire Street
	Grass Valley, CA 95945
	Nevada County
Facility Contact, Title, and Phone	Gold Mine Sector Superintendent, (530) 273-3884
Mailing Address	SAME
Type of Facility	Industrial (Gold Mine)
Facility Design Flow	Not Available

II. FINDINGS

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

- A. Background.** The State of California, Department of Parks and Recreation (hereinafter Discharger), submitted a Report of Waste Discharge, dated 23 September 2005, and applied for a National Pollutant Discharge Elimination System (NPDES) permit authorization to discharge wastewater from the Empire Mine State Historic Park.
- B. Facility Description.** The Discharger owns and operates the Empire Mine State Historic Park. Wastewater is discharged from a constructed mine drain to Discharge Point EFF-001 (see table on cover page) to an unnamed tributary to the South Fork of Wolf Creek, a water of the United States and a tributary to the South Fork of Wolf Creek, Wolf Creek, and the Bear River within the Wolf Creek Hydrologic Subarea (516.32) in the Upper Bear Hydrologic Area and the Bear River Hydrologic Unit. There is currently no treatment provided. Attachment B provides a map of the area around the facility.
- C. Legal Authorities.** This Order is issued pursuant to section 402 of the Federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (USEPA) and Chapter 5.5, Division 7 of the California Water Code (CWC). It shall serve as a NPDES permit for a point source discharge from this facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to Article 4, Chapter 4 of the CWC for discharges that are not subject to regulation under CWA section 402.
- D. Background and Rationale for Requirements.** The Regional Water Board developed the requirements in this Order based on information submitted as part of the application and other available information. The Fact Sheet (Attachment F), which contains background information and rationale for Order requirements, is hereby incorporated into this Order and constitutes part of the Findings for this Order. Attachments A through E and G are also incorporated into this Order.

- E. California Environmental Quality Act (CEQA).** This action to adopt an NPDES permit is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21000, *et seq.*) in accordance with Section 13389 of the CWC.
- F. Technology-Based Effluent Limitations.** The Code of Federal Regulations (CFR) at 40 CFR §122.44(a) requires that permits include applicable technology-based limitations and standards. This Order includes technology-based effluent limitations based on Effluent Limitations Guidelines and Standards for the Ore Mining and Dressing Point Source Category in 40 CFR Part 440, Subpart J—Copper, Lead, Zinc, Gold, Silver, and Molybdenum Ores Subcategory. A detailed discussion of the technology-based effluent limitations development is included in the Fact Sheet (Attachment F).
- G. Water Quality-Based Effluent Limitations.** Section 122.44(d) of 40 CFR requires that permits include water quality-based effluent limitations (WQBELs) to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water. Where numeric water quality objectives have not been established, 40 CFR §122.44(d) specifies that WQBELs may be established using USEPA criteria guidance under CWA section 304(a), proposed State criteria or a State policy interpreting narrative criteria supplemented with other relevant information, or an indicator parameter.
- H. Water Quality Control Plans.** The Regional Water Board adopted a *Water Quality Control Plan, Fourth Edition*, 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. In addition, State Water Resources Control Board (State Water Board) Resolution No. 88-63 requires that, with certain exceptions, the Regional Water Board assign the municipal and domestic supply use to water bodies that do not have beneficial uses listed in the Basin 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 the unnamed tributary to the South Fork of Wolf Creek, but does identify present and potential uses for the Bear River, to which the unnamed tributary to the South Fork of Wolf Creek, via the South Fork of Wolf Creek and Wolf Creek, is tributary. These beneficial uses are as follows: municipal and domestic supply, agricultural irrigation and stockwatering, hydropower generation, water contact recreation (including canoeing and rafting), non-contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat, cold spawning habitat, and wildlife habitat. In addition, State Water Resources Control Board (State Water Board) Resolution No. 88-63 requires that, with certain exceptions, the Regional Water Board assign the municipal and domestic supply use to water bodies that do not have beneficial uses listed in the Basin Plan. Thus, as discussed in detail in the Fact Sheet (Attachment F), beneficial uses applicable to the unnamed tributary to the South Fork of Wolf Creek are as follows:

Discharge Point	Receiving Water Name	Beneficial Use(s)
EFF-001	Unnamed Tributary to the South Fork of Wolf Creek	<p><u>Existing:</u> Municipal and domestic supply (MUN); agricultural supply, including stock watering (AGR); hydropower generation (POW); water contact recreation, including canoeing and rafting (REC-1); non-contact water recreation, including aesthetic enjoyment (REC-2); warm freshwater habitat (WARM); cold freshwater habitat (COLD); and wildlife habitat (WILD).</p> <p><u>Potential:</u> Warm migration of aquatic organisms (MGR); cold migration of aquatic organisms (MGR); warm spawning, reproduction, and/or early development (SPWN); and cold spawning, reproduction, and /or early development (SPWN);</p> <p><u>Groundwater:</u> Municipal and domestic water supply (MUN), industrial service supply (IND), industrial process supply (PRO), and agricultural supply (AGR).</p>

The Basin Plan includes a list of Water Quality Limited Segments (WQLSs), which are defined as “...those sections of lakes, streams, rivers or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate limitations for point sources (40 CFR 130, et seq.)” The Basin Plan also states, “Additional treatment beyond minimum federal standards will be imposed on dischargers to WQLSs. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment.” Wolf Creek is listed as a WQLS for fecal coliform organisms in the 303(d) list of impaired water bodies. The discharge is not a suspected source of fecal coliform organisms and will not impact the “impaired water body” status. The Bear River is listed as a WQLS for mercury in fish tissue in the 303(d) list of impaired water bodies. Effluent Limitations for mercury constituents are included in this Order.

Requirements of this Order specifically implement the applicable *Water Quality Control Plans*.

- I. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** USEPA adopted the NTR on 22 December 1992, which was amended on 4 May 1995 and 9 November 1999, and the CTR on 18 May 2000, which was amended on 13 February 2001. These rules include water quality criteria for priority pollutants and are applicable to this discharge.
- J. **State Implementation Policy.** On 2 March 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on 28 April 2000 with respect to the priority pollutant criteria promulgated for California by the USEPA through the NTR and to the priority pollutant objectives established by the Regional Water Board in the Basin Plan. The SIP became effective on 18 May 2000 with respect to the priority pollutant criteria promulgated by the USEPA through the California Toxics Rule. The State Water Board adopted amendments to the SIP on 24 February 2005 that became effective on 13 July 2005.

- K. Compliance Schedules and Interim Requirements.** Section 2.1 of the SIP provides that, based on a discharger's request and demonstration that it is infeasible for an existing discharger to achieve immediate compliance with an effluent limitation derived from a CTR criterion, compliance schedules may be allowed in an NPDES permit. Unless an exception has been granted under Section 5.3 of the SIP, a compliance schedule may not exceed five years from the date that the permit is issued or reissued, nor may it extend beyond ten years from the effective date of the SIP (or 18 May 2010) to establish and comply with CTR criterion-based effluent limitations. Where a compliance schedule for a final effluent limitation exceeds one year, the Order must include interim numeric limitations for that constituent or parameter. Where allowed by the Basin Plan, compliance schedules and interim effluent limitations or discharge specifications may also be granted to allow time to implement a new or revised water quality objective. This Order does include compliance schedules and interim effluent limitations. A detailed discussion of the basis for the compliance schedules and interim effluent limitations is included in the Fact Sheet (Attachment F).
- L. Alaska Rule.** On 30 March 2000, USEPA revised its regulation that specifies when new and revised State and Tribal water quality standards (WQS) become effective for CWA purposes (40 CFR 131.21, 65 FR 24641, 27 April 2000). Under the revised regulation (also known as the Alaska rule), new and revised standards submitted to USEPA after 30 May 2000 must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by 30 May 2000 may be used for CWA purposes, whether or not approved by USEPA.
- M. Stringency of Requirements for Individual Pollutants.** This Order contains restrictions on individual pollutants that are no more stringent than required by the federal CWA. Individual pollutant restrictions consist of technology-based restrictions and water quality-based effluent limitations. The technology-based effluent limitations consist of restrictions on total suspended solids. Restrictions on total suspended solids are specified in federal regulations as discussed in 40 CFR 440.102, and the permit's technology-based pollutant restrictions are no more stringent than required by the CWA. Water quality-based effluent limitations have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. To the extent that toxic pollutant water quality-based effluent limitations were derived from the CTR, the CTR is the applicable standard pursuant to 40 CFR 131.38. The scientific procedures for calculating the individual water quality-based effluent limitations are based on the CTR-SIP, which was approved by USEPA on 18 May 2000. All beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by USEPA prior to 30 May 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to 30 May 2000, but not approved by USEPA before that date, are nonetheless "*applicable water quality standards for purposes of the CWA*" pursuant to 40 CFR 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the technology-based requirements of the CWA and the applicable water quality standards for purposes of the CWA.
- N. Antidegradation Policy.** Section 131.12 of 40 CFR requires that State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution 68-16, which

incorporates the requirements of the federal antidegradation policy. Resolution 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. As discussed in detail in the Fact Sheet (Attachment F) the permitted discharge is consistent with the antidegradation provision of 40 CFR §131.12 and State Water Board Resolution 68-16.

- O. Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at 40 CFR § 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. This is the first permit issued to regulate this discharge.
- P. Monitoring and Reporting.** Section 122.48 of 40 CFR requires that all NPDES permits specify requirements for recording and reporting monitoring results. Sections 13267 and 13383 of the CWC authorize the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program establishes monitoring and reporting requirements to implement federal and State requirements. The Monitoring and Reporting Program is provided as Attachment E.

Section 1.2 of the SIP directs the Regional Water Board to require, pursuant to California Water Code Section 13267, all NPDES dischargers to submit data sufficient to (1) determine if priority pollutants require effluent limitations (reasonable potential analysis) and (2) calculate water quality-based effluent limitations. Further, Section 2.4 of the SIP requires that each discharger submit to the Regional Water Boards reports necessary to determine compliance with effluent limitations for priority pollutants in permits. This Order requires the Discharger to conduct sampling for priority toxic pollutants and other constituents and to report those results to the Regional Water Board. A detailed discussion of the basis for the study and the specific requirements are included in the Fact Sheet (Attachment F) and the Constituent Study (Attachment G).

- Q. Standard and Special Provisions.** Standard Provisions, which in accordance with 40 CFR §§122.41 and 122.42, apply to all NPDES discharges and must be included in every NPDES permit, are provided in Attachment D. The Regional Water Board has also included in this Order special provisions applicable to the Discharger. A rationale for the special provisions contained in this Order is provided in the attached Fact Sheet (Attachment F).
- R. Notification of Interested Parties.** The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe Waste Discharge Requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet (Attachment F) of this Order.
- S. Consideration of Public Comment.** The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. Details of the Public Hearing are provided in the Fact Sheet ([Attachment F](#)) of this Order.

III. DISCHARGE PROHIBITIONS

- A.** Discharge of wastewater at a location or in a manner different from that described in the Findings is prohibited.
- B.** The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Federal Standard Provision I.A.7. [See Attachment D – Federal Standard Provisions] and Regional Water Board Standard Provision VI.A.2.f.
- C.** Neither the discharge nor its treatment shall create a nuisance as defined in Section 13050 of the California Water Code.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations – Discharge Point EFF-001

1. Final Effluent Limitations – Discharge Point EFF-001

- a. The discharge of **mine drainage from the Magenta Drain portal** shall maintain compliance with the following effluent limitations at Discharge Point **EFF-001**, with compliance measured at Monitoring Location **EFF-001** as described in the attached Monitoring and Reporting Program (Attachment E):

Parameter	Units	Effluent Limitations			
		Average Monthly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Total Suspended Solids	mg/L	20	30	--	--
Settleable Solids	mL/L-hr	0.1	0.2	--	--
pH	standard units	--	--	6.5	8.5
Turbidity	NTU	5	--	--	--
Color	color units	15	--	--	--
Aluminum	µg/L	71	140	--	--
Antimony, Total Recoverable	µg/L	6	--	--	--
Arsenic, Total Recoverable	µg/L	10	--	--	--
Barium, Total Recoverable	µg/L	1,000	--	--	--
Cadmium, Total Recoverable	µg/L	0.26	0.53	--	--
Chromium (III)	µg/L	36	72	--	--
Cobalt, Total Recoverable	µg/L	50	--	--	--
Copper, Total Recoverable	µg/L	1.2	2.3	--	--
Iron, Total Recoverable	µg/L	300	--	--	--
Lead, Total Recoverable	µg/L	0.23	0.47	--	--
Manganese, Total Recoverable	µg/L	50	--	--	--
Mercury, Total Recoverable	µg/L	0.050	0.10	--	--
Nickel, Total Recoverable	µg/L	8.6	17	--	--
Thallium, Total Recoverable	µg/L	1.7	5.6	--	--
Vanadium, Total Recoverable	µg/L	100	--	--	--
Zinc, Total Recoverable	µg/L	12	24	--	--

- b. **Acute Toxicity:** Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

Minimum for any one bioassay - - - - - 70%
 Median for any three consecutive bioassays - - - - 90%

- c. **Dissolved Oxygen:** Dissolved oxygen in the discharge shall be no less than:

- i. 85 percent of saturation as the monthly median of the mean daily dissolved oxygen concentration;
- ii. 75 percent of saturation as the 95 percentile dissolved oxygen concentration; and
- iii. 7.0 mg/L at any time.

2. Interim Effluent Limitations– Discharge Point EFF-001

- a. During the period beginning **1 August 2006** and ending on **18 May 2010**, the discharge of **mine drainage from the Magenta Drain portal** shall maintain compliance with the following interim effluent limitations at Discharge Point **EFF-001**, with compliance measured at Monitoring Location **EFF-001** as described in the attached Monitoring and Reporting Program (Attachment E). These interim effluent limitations shall apply in lieu of the corresponding final effluent limitations specified for the same parameters during the time period indicated in this provision.

Parameter	Units	Effluent Limitations	
		Average Monthly	Maximum Daily
Cadmium, Total Recoverable	µg/L	2,100	4,200
Chromium (III)	µg/L	220	450
Copper, Total Recoverable	µg/L	170	350
Lead, Total Recoverable	µg/L	560	1,100
Mercury, Total Recoverable	µg/L	4.9	9.2
Nickel, Total Recoverable	µg/L	65	130
Thallium, Total Recoverable	µg/L	5,900	20,000
Zinc, Total Recoverable	µg/L	3,700	7,400

B. Land Discharge Specifications—*Not Applicable*

C. Reclamation Specifications—*Not Applicable*

V. RECEIVING WATER LIMITATIONS

A. Surface Water Limitations

Receiving water limitations are based on water quality objectives contained in the Basin Plan and are a required part of this Order. The discharge shall not cause the following in the unnamed tributary to the South Fork of Wolf Creek or downstream waters:

1. **Fecal Coliform.** The fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, to exceed a geometric mean of 200 MPN/100 mL, nor more than ten percent of the total number of fecal coliform samples taken during any 30-day period to exceed 400 MPN/100 mL.
2. **Biostimulatory Substances.** Water to contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.
3. **Chemical Constituents.** Chemical constituents to be present in concentrations that adversely affect beneficial uses.
4. **Discoloration.** Discoloration that causes nuisance or adversely affects beneficial uses.
5. **Dissolved Oxygen:**
 - a. The monthly median of the mean daily dissolved oxygen concentration to fall below 85 percent of saturation in the main water mass;
 - b. The 95 percentile dissolved oxygen concentration to fall below 75 percent of saturation; nor
 - c. The dissolved oxygen concentration to be reduced below 7.0 mg/L at any time.
6. **Floating Material.** Floating material to be present in amounts that cause nuisance or adversely affect beneficial uses.
7. **Oils and Greases.** Oils, greases, waxes, or other materials to be present in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.
8. **pH.** The pH to be depressed below 6.5, raised above 8.5, nor changed by more than 0.5 units. A one-month averaging period may be applied when calculating the pH change of 0.5 units.
9. **Pesticides:**
 - a. Pesticides to be present, individually or in combination, in concentrations that adversely affect beneficial uses;

- b. Pesticides to be present in bottom sediments or aquatic life in concentrations that adversely affect beneficial uses;
- c. Total identifiable persistent chlorinated hydrocarbon pesticides to be present in the water column at concentrations detectable within the accuracy of analytical methods approved by USEPA or the Executive Officer.
- d. Pesticide concentrations to exceed those allowable by applicable antidegradation policies (see State Water Board Resolution No. 68-16 and 40 CFR §131.12.).
- e. Pesticide concentrations to exceed the lowest levels technically and economically achievable.
- f. Pesticides to be present in concentration in excess of the maximum contaminant levels set forth in California Code of Regulations, Title 22, Division 4, Chapter 15.
- g. Thiobencarb to be present in excess of 1.0 µg/L.

10. **Radioactivity:**

- a. Radionuclides to be present in concentrations that are harmful to human, plant, animal, or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.
- b. Radionuclides to be present in excess of the maximum contaminant levels specified in Table 4 (MCL Radioactivity) of Section 64443 of Title 22 of the California Code of Regulations.

11. **Suspended Sediments.** The suspended sediment load and suspended sediment discharge rate of surface waters to be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

12. **Settleable Substances.** Substances to be present in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses

13. **Suspended Material.** Suspended material to be present in concentrations that cause nuisance or adversely affect beneficial uses.

14. **Taste- or Odor-Producing Substances.** Taste- or odor-producing substances to be present in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.

15. **Temperature.** The natural temperature to be increased by more than 5°F.

16. **Toxic Substances.** Toxic substances to be present, individually or in combination, in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.

17. **Turbidity.** The turbidity to increase as follows:

- a. More than 1 Nephelometric Turbidity Unit (NTU) where natural turbidity is between 0 and 5 NTUs.
- b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.
- c. More than 10 NTU where natural turbidity is between 50 and 100 NTUs.
- d. More than 10 percent where natural turbidity is greater than 100 NTUs.

B. Groundwater Limitations—*Not Applicable*

VI. PROVISIONS

A. Standard Provisions

1. **Federal Standard Provisions.** The Discharger shall comply with all Standard Provisions included in Attachment D of this Order.

The Regional Water Board is authorized to enforce the terms of this permit under several provisions of the CWC, including, but not limited to, Sections 13385, 13386, and 13387.

2. **Regional Water Board Standard Provisions.** The Discharger shall comply with the following provisions:
 - a. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to:
 - i. violation of any term or condition contained in this Order;
 - ii. obtaining this Order by misrepresentation or by failing to disclose fully all relevant facts;
 - iii. a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge; and
 - iv. a material change in the character, location, or volume of discharge.

The causes for modification include:

- i. New regulations. New regulations have been promulgated under Section 405(d) of the Clean Water Act, or the standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued.

- ii. Change in sludge use or disposal practice. Under 40 Code of Federal Regulations (CFR) 122.62(a)(1), a change in the Discharger's sludge use or disposal practice is a cause for modification of the permit. It is cause for revocation and reissuance if the Discharger requests or agrees.

The Regional Water Board may review and revise this Order at any time upon application of any affected person or the Board's own motion.

- b. If a toxic effluent standard or prohibition (including any scheduled compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the CWA, or amendments thereto, for a toxic pollutant that is present in the discharge authorized herein, and such standard or prohibition is more stringent than any limitation upon such pollutant in this Order, the Regional Water Board will revise or modify this Order in accordance with such toxic effluent standard or prohibition.

The Discharger shall comply with effluent standards and prohibitions within the time provided in the regulations that establish those standards or prohibitions, **even if this Order has not been modified.**

- c. If more stringent applicable water quality standards are approved, pursuant to Section 303 of the CWA, or amendments thereto, the Board will revise and modify this Order in accordance with such more stringent standards.
- d. This Order shall be modified, or alternately revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the CWA, if the effluent standard or limitation so issued or approved:
 - i. contains different conditions or is otherwise more stringent than any effluent limitation in the Order; or
 - ii. controls any pollutant limited in the Order.

The Order, as modified or reissued under this paragraph, shall also contain any other requirements of the CWA then applicable.

- e. The provisions of this Order are severable. If any provision of this Order is found invalid, the remainder of this Order shall not be affected.
- f. By-pass (the intentional diversion of waste streams from any portion of a treatment facility, except those portions designed to meet variable effluent limits) is prohibited except under the following conditions:
 - i. by-pass is required for essential maintenance to assure efficient operation;

and

- ii. neither effluent nor receiving water limitations are exceeded;
- and**
- iii. the Discharger notifies the Regional Water Board ten days in advance.
- g. The Discharger shall take all reasonable steps to minimize any adverse effects to waters of the State or users of those waters resulting from any discharge or disposal in violation of this Order. Reasonable steps shall include such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge or sludge use or disposal.
 - h. The discharge of any radiological, chemical or biological warfare agent or high-level, radiological waste is prohibited.
 - i. A copy of this Order shall be maintained at the discharge facility and be available at all times to operating personnel. Key operating personnel shall be familiar with its content.
 - j. Neither the treatment nor the discharge shall create a condition of nuisance or pollution as defined by the CWC, Section 13050.
 - k. Safeguard to electric power failure:
 - i. The Discharger shall provide safeguards to assure that, should there be reduction, loss, or failure of electric power, the discharge shall comply with the terms and conditions of this Order.
 - ii. Upon written request by the Regional Water Board the Discharger shall submit a written description of safeguards. Such safeguards may include alternate power sources, standby generators, retention capacity, operating procedures, or other means. A description of the safeguards provided shall include an analysis of the frequency, duration, and impact of power failures experienced over the past five years on effluent quality and on the capability of the Discharger to comply with the terms and conditions of the Order. The adequacy of the safeguards is subject to the approval of the Regional Water Board.
 - iii. Should the treatment works not include safeguards against reduction, loss, or failure of electric power, or should the Regional Water Board not approve the existing safeguards, the Discharger shall, within ninety days of having been advised in writing by the Regional Water Board that the existing safeguards are inadequate, provide to the Regional Water Board and USEPA a schedule of compliance for providing safeguards such that in the event of reduction, loss, or failure of electric power, the Discharger shall comply with the terms and conditions of this Order. The schedule of compliance shall, upon approval of the Regional Water Board, become a condition of this Order.

- l. The Discharger, upon written request of the Regional Water Board, shall file with the Board a technical report on its preventive (failsafe) and contingency (cleanup) plans for controlling accidental discharges, and for minimizing the effect of such events. This report may be combined with that required under Regional Water Board Standard Provision VI.A.2.k.

The technical report shall:

- i. Identify the possible sources of spills, leaks, untreated waste by-pass, and contaminated drainage. Loading and storage areas, power outage, waste treatment unit outage, and failure of process equipment, tanks and pipes should be considered.
- ii. Evaluate the effectiveness of present facilities and procedures and state when they became operational.
- iii. Predict the effectiveness of the proposed facilities and procedures and provide an implementation schedule containing interim and final dates when they will be constructed, implemented, or operational.

The Regional Water Board, after review of the technical report, may establish conditions which it deems necessary to control accidental discharges and to minimize the effects of such events. Such conditions shall be incorporated as part of this Order, upon notice to the Discharger.

- m. The Discharger shall submit technical reports as directed by the Executive Officer.
- n. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. In the event a certified laboratory is not available to the Discharger, analyses performed by a noncertified laboratory will be accepted provided a Quality Assurance-Quality Control Program is instituted by the laboratory. A manual containing the steps followed in this program must be kept in the laboratory and shall be available for inspection by Board staff. The Quality Assurance-Quality Control Program must conform to EPA guidelines or to procedures approved by the Regional Water Board.

Unless otherwise specified, all metals shall be reported as Total Metals.

Unless otherwise specified, bioassays shall be performed in the following manner:

- i. Acute bioassays shall be performed in accordance with guidelines approved by the Regional Water Board and the Department of Fish and Game or in accordance with methods described in USEPA's manual for measuring acute toxicity of effluents (EPA-821-R-02-012 and subsequent amendments).
- ii. Short-term chronic bioassays shall be performed in accordance with USEPA guidelines (EPA-821-R-02-013 and subsequent amendments).

- o. Laboratories that perform sample analyses must be identified in all monitoring reports submitted to the Regional Water Board and USEPA.
- p. The Discharger shall conduct analysis on any sample provided by USEPA as part of the Discharge Monitoring Quality Assurance (DMQA) program. The results of any such analysis shall be submitted to USEPA's DMQA manager.
- q. Effluent samples shall be taken downstream of the last addition of wastes to the treatment or discharge works where a representative sample may be obtained prior to mixing with the receiving waters. Samples shall be collected at such a point and in such a manner to ensure a representative sample of the discharge.
- r. All monitoring and analysis instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary, at least yearly, to ensure their continued accuracy.
- s. The Discharger shall file with the Regional Water Board technical reports on self-monitoring performed according to the detailed specifications contained in the Monitoring and Reporting Program (Attachment E) attached to this Order.
- t. The results of all monitoring required by this Order shall be reported to the Regional Water Board, and shall be submitted in such a format as to allow direct comparison with the limitations and requirements of this Order. Unless otherwise specified, discharge flows shall be reported in terms of the monthly average and the daily maximum discharge flows.
- u. Upon written request of the Board, the Discharger shall submit a summary monitoring report to the Board. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year(s).

B. Monitoring and Reporting Program Requirements

1. The discharger shall comply with the Monitoring and Reporting Program, and future revisions thereto, in Attachment E of this Order.
2. **Within 60 days of permit adoption**, the Discharger shall submit a report outlining minimum levels, method detection limits, and analytical methods for approval, with a goal to achieve detection levels below applicable water quality criteria. At a minimum, the Discharger shall comply with the monitoring requirements for CTR constituents as outlined in Section 2.3 and 2.4 of the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*, adopted 2 March 2000 by the State Water Resources Control Board. All peaks identified by analytical methods shall be reported.
3. This permit, and the Monitoring and Reporting Program which is a part of this permit, requires that certain parameters be monitored on a continuous basis. The wastewater treatment plant is not staffed on a full time basis. Permit violations or system upsets can go undetected during this period. The Discharger is required to establish an electronic system

for operator notification for continuous recording device alarms. For existing continuous monitoring systems, the electronic notification system shall be installed **upon startup of the treatment system**. For systems installed following permit adoption, the notification system shall be installed simultaneously.

C. Special Provisions

1. Reopener Provisions

- a. **New Standards.** Upon adoption of any applicable water quality standard for receiving waters, including, but not limited to, a mercury total maximum daily load (TMDL), by the Regional Water Board or the State Water Board pursuant to the CWA and regulations adopted thereunder, this permit may be reopened and limitations based on the new standard added.
- b. **Constituent Study.** If, after review of the results of the study required in VI.C.2.a (details in Attachment G) or routine monitoring required in the Monitoring and Reporting Program (Attachment E), it is determined that the discharge has reasonable potential to cause or contribute to an exceedance of a water quality objective, this Order may be reopened and effluent limitations added for the subject constituents.
- c. **Hardness.** This Order requires characterization of the receiving stream hardness and the discharge. If the results of the characterization indicate a different ambient hardness, this Order may be reopened and modified.
- d. **Salinity.** Various possible treatment techniques for the discharge have the potential to either increase or decrease the salinity of the effluent. If TDS in the discharge following implementation of any potential treatment techniques continues to exceed the Agricultural Water Quality Goal, this Order may be reopened and Effluent Limitations for TDS added.
- e. **Mass Limitations.** If a treatment system is designed on a mass-loading basis, this Order may be reopened and mass limitations added.
- f. **Whole Effluent Toxicity.** As a result of a Toxicity Reduction Evaluation (TRE), this Order may be reopened to include a chronic toxicity limitation, a new acute toxicity limitation, and/or a limitation for a specific toxicant identified in the TRE. Additionally, if a numeric chronic toxicity water quality objective is adopted by the State Water Board, this Order may be reopened to include a numeric chronic toxicity effluent limitation based on that objective.

2. Special Studies, Technical Reports and Additional Monitoring Requirements

- a. **Constituent Study.** The Discharger shall comply with the following time schedule in conducting the study of USEPA priority toxic pollutants and additional constituents and parameters which could exceed Basin Plan numeric or narrative water quality objectives, and their potential effect in surface waters described in Attachment G:

<u>Task</u>	<u>Compliance Date</u>
Submit Workplan and Time Schedule	15 September 2006
Begin Study	1 November 2006
Complete Study	31 October 2007
Submit Study Report	30 November 2007

To the extent that there is overlap between this request and monitoring already required under this Order, the monitoring need not be duplicated.

The Discharger shall submit to the Regional Water Board on or before each compliance due date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Water Board by letter when it returns to compliance with the time schedule.

If after review of the study results it is determined that the discharge has reasonable potential to cause or contribute to an exceedance of a water quality objective, this Order will be reopened and effluent limitations added for the subject constituents.

- b. **Chronic Whole Effluent Toxicity.** The Discharger shall conduct the chronic toxicity testing specified in the Monitoring and Reporting Program. If, after commencement of treatment of the discharge, the testing indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the narrative water quality objective for toxicity, this Order requires the Discharger to initiate a Toxicity Identification Evaluation (TIE) to identify the causes of toxicity. Upon completion of the TIE, the Discharger is required to submit a workplan to conduct a Toxicity Reduction Evaluation (TRE) and, after Regional Water Board evaluation, conduct the TRE. This Order may be reopened and a chronic toxicity limitation included and/or a limitation for the specific toxicant identified in the TRE included. Additionally, if a chronic toxicity water quality objective is adopted by the State Water Board, this Order may be reopened and a limitation based on that objective included.
- c. **Regeneration and Sampling Schedule.** Many possible treatment processes for mine drainage discharges utilize absorption processes, which must be regenerated or replaced as the treatment process becomes saturated with pollutants. Pollutant “breakthrough” of the treatment process can be projected allowing for timely regeneration/replacement of the treatment process. Increased sampling should be undertaken as the age of the treatment process approaches the regeneration/replacement point. The regeneration/replacement point should be established utilizing a factor of safety to assure

there is no “breakthrough” of pollutants. If the Discharger utilizes a treatment process which must be periodically regenerated or replaced, the Discharger shall comply with the following time schedule in preparing a treatment process regeneration/replacement schedule and a proposed pollutant sampling schedule:

<u>Task</u>	<u>Compliance Date</u>
Submit Workplan and Time Schedule	1 May 2008
Submit Regeneration/Replacement and Sampling Schedules	31 May 2009

The Discharger shall submit to the Regional Water Board on or before each compliance due date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Water Board by letter when it returns to compliance with the time schedule.

If after review of the study results it is determined that the discharge has reasonable potential to cause or contribute to an exceedance of a water quality objective, this Order will be reopened and effluent limitations added for the subject constituents.

3. Best Management Practices and Pollution Prevention—*Not Applicable*

4. Construction, Operation and Maintenance Specifications

- a. The treatment facilities shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
- b. This Order, and the Monitoring and Reporting Program which is a part of this permit, requires that certain parameters be monitored on a continuous basis. The Discharger is required to establish an electronic system for operator notification for continuous recording device alarms. For systems installed following permit adoption, the notification system shall be installed simultaneously.
- c. **Solids Disposal Requirements.**
 - i. Collected screenings and solids removed from liquid wastes shall be disposed of in a manner approved by the Executive Officer, and consistent with *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste*, as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, *et seq.*
 - ii. Any proposed change in solids disposal practice from a previously approved practice shall be reported to the Executive Officer and USEPA Regional Administrator at least **90 days** in advance of the change.
 - iii. By **31 May 2007**, the Discharger shall submit a solids disposal plan describing the annual volume of solids generated by the treatment facility and specifying the disposal practices.

5. Special Provisions for Municipal Facilities (POTWs Only)—*Not Applicable*

6. Other Special Provisions

- a. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code, Sections 6735, 7835, and 7835.1. To demonstrate compliance with Title 16, CCR, Sections 415 and 3065, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.
- b. In the event the Discharger does not comply or will be unable to comply for any reason, with any prohibition or limitation contained in this Order, the Discharger shall notify the Regional Water Board by telephone (916) 464-3291 within 24 hours of having knowledge of such noncompliance, and shall confirm this notification in writing within five days, unless the Regional Water Board waives confirmation. The written notification shall include the information required by Federal Standard Provision V.E.1 [*40 CFR §122.41(l)(6)(i)*].
- c. Prior to making any change in the discharge point, place of use, or purpose of use of the wastewater, the Discharger shall obtain approval of, or clearance from the State Water Resources Control Board (Division of Water Rights).
- d. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office.

To assume operation 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, address and telephone number of the persons responsible for contact with the Regional Water Board and a statement. The statement shall comply with the signatory paragraph of Standard Provision V.B 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 shall be approved or disapproved in writing by the Executive Officer.

- e. The Discharger shall file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, not later than 180 days in advance of the Order expiration date as application for issuance of new waste discharge requirements.

7. Compliance Schedules

- a. The Discharger shall comply with the following time schedule to assure compliance with Effluent Limitations contained in Effluent Limitations IV.A.1 of this Order:

<u>Task</u>	<u>Compliance Date</u>	<u>Report Due Date</u>
Submit Annual Status Report		31 May
Submit Workplan/Time Schedule ¹		31 December 2007
Full Compliance	18 May 2010	

¹ Including treatment flow schematic, showing both liquid and solid streams

The Discharger shall submit to the Regional Water Board on or before each compliance report due date, the specified document or, if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is being reported, the reasons for such noncompliance shall be stated, plus an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Water Board by letter when it returns to compliance with the time schedule.

- b. **Cadmium, Chromium (III), Copper, Lead, Mercury, Nickel, Thallium, Zinc Compliance Schedule:** This Order contains Effluent Limitations based on water quality criteria contained in the CTR and NTR for cadmium, chromium (III), copper, lead, mercury, nickel, thallium, and zinc. The final water quality based effluent limitations for cadmium, chromium (III), copper, lead, mercury, nickel, thallium, and zinc required by this Order shall become effective on **18 May 2010**. As this compliance schedule is greater than one year, the Discharger shall submit semi-annual progress reports on **31 May** and **30 November** of each year until the Discharger achieves compliance with the final water quality based effluent limitations for cadmium, chromium (III), copper, lead, mercury, nickel, thallium, and zinc.

VII. COMPLIANCE DETERMINATION

Compliance with the effluent limitations contained in Section IV of this Order will be determined as specified below:

A. Average Monthly Effluent Limitation (AMEL).

If the average of daily discharges over a calendar month exceeds the AMEL for a given parameter, this will represent a single violation, though the Discharger will be considered out of compliance for each day of that month for that parameter (*e.g.*, resulting in 31 days of non-compliance in a 31-day month). If only a single sample is taken during the calendar month and the analytical result for that sample exceeds the AMEL, the discharger will be considered out of compliance for that calendar month. The Discharger will only be considered out of compliance for days when the discharge occurs. For any one calendar month during which no sample (daily discharge) is taken, no compliance determination can be made for that calendar month.

B. Maximum Daily Effluent Limitation (MDEL).

If a daily discharge exceeds the MDEL for a given parameter, the discharger will be considered out of compliance for that parameter for that one day only within the reporting period. For any one day during which no sample is taken, no compliance determination can be made for that day.

C. Instantaneous Minimum Effluent Limitation.

If the analytical result of a single grab sample is lower than the instantaneous minimum effluent limitation for a parameter, the discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (*e.g.*, the results of two grab samples taken within a calendar day that both are lower than the instantaneous minimum effluent limitation would result in two instances of non-compliance with the instantaneous minimum effluent limitation).

D. Instantaneous Maximum Effluent Limitation.

If the analytical result of a single grab sample is higher than the instantaneous maximum effluent limitation for a parameter, the discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (*e.g.*, the results of two grab samples taken within a calendar day that both exceed the instantaneous maximum effluent limitation would result in two instances of non-compliance with the instantaneous maximum effluent limitation).

ATTACHMENT A – DEFINITIONS

Average Monthly Effluent Limitation (AMEL): the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Daily Discharge: Daily Discharge is defined as either: (1) the total mass of the constituent discharged over the calendar day (12:00 am through 11:59 pm) or any 24-hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (*e.g.*, concentration).

The daily discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day or other 24-hour period defined as a day) or by the arithmetic mean of analytical results from one or more grab samples taken over the course of the day.

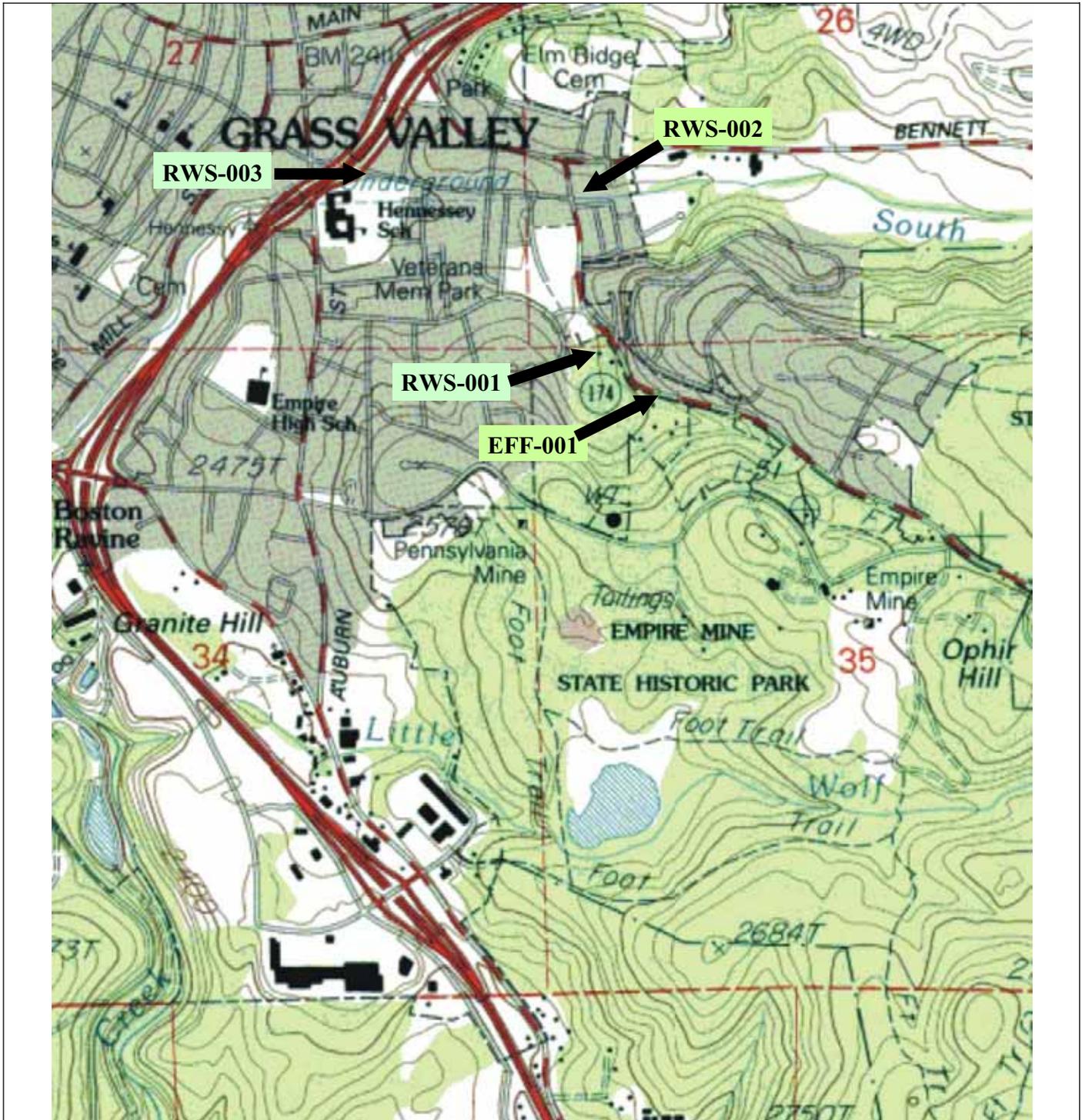
For composite sampling, if one day is defined as a 24-hour period other than a calendar day, the analytical result for the 24-hour period will be considered as the result for the calendar day in which the 24-hour period ends.

Instantaneous Maximum Effluent Limitation: the highest allowable value for any single grab sample or aliquot (*i.e.*, each grab sample or aliquot is independently compared to the instantaneous maximum limitation).

Instantaneous Minimum Effluent Limitation: the lowest allowable value for any single grab sample or aliquot (*i.e.*, each grab sample or aliquot is independently compared to the instantaneous minimum limitation).

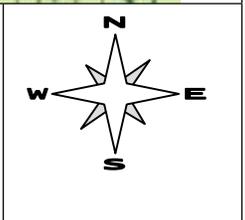
Maximum Daily Effluent Limitation (MDEL): the highest allowable daily discharge of a pollutant.

ATTACHMENT B – TOPOGRAPHIC MAP: VICINITY MAP

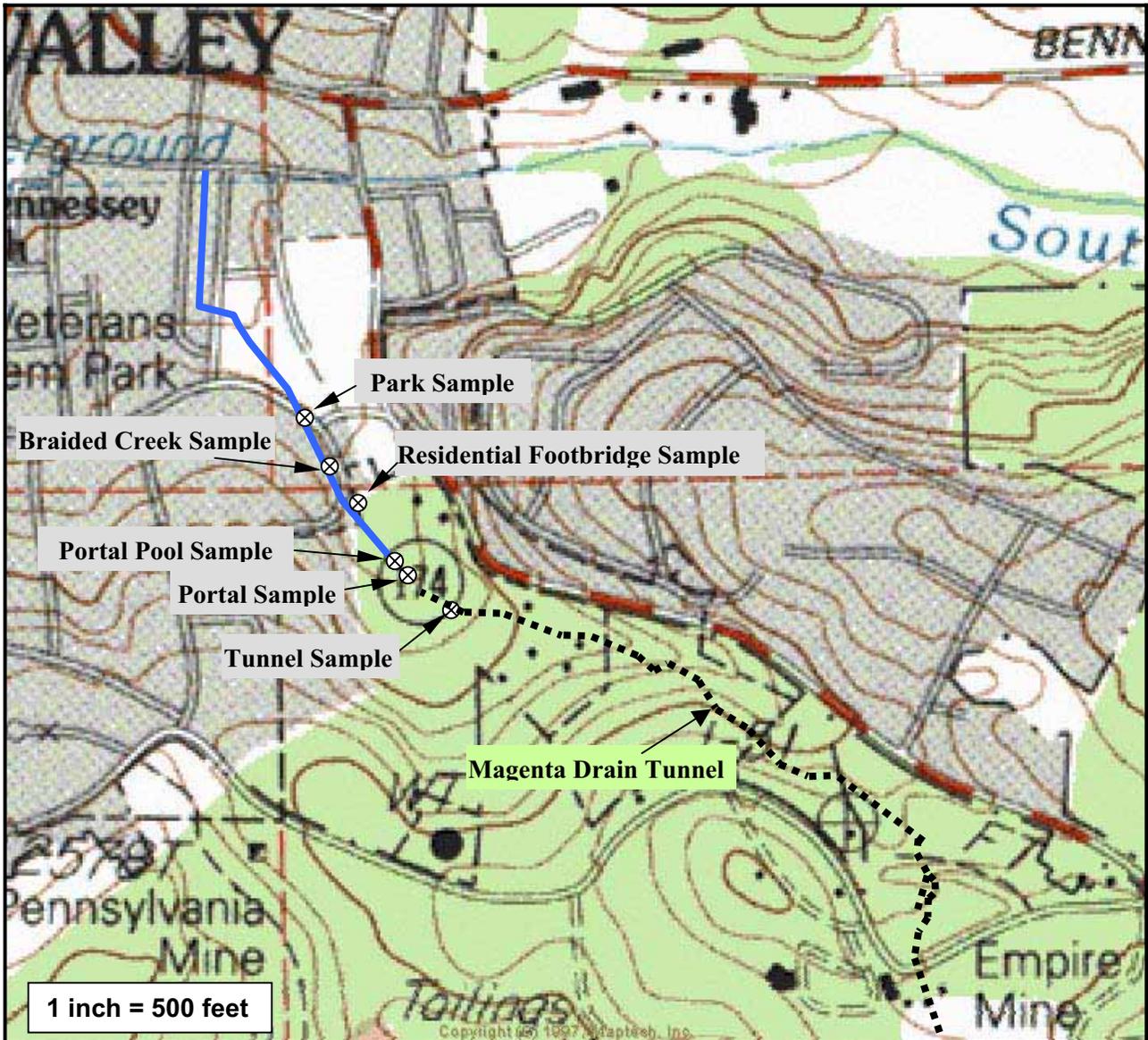


Grass Valley
 USGS Quadrangle
 7.5 Minute Series
 Scale: 1 inch = 2,000 feet

State of California, Department of Parks and Recreation
 Empire Mine State Historic Park
 Nevada County
 Section 26,27,35, T16N, R8E, MDB&M



ATTACHMENT B – TOPOGRAPHIC MAP: SAMPLING LOCATIONS



Attachment B – Topographic Map: Sampling Locations

Park Sample (AP, At Tennis Courts Above Park)
Braided Creek Sample (Braid)
Residential Footbridge Sample (DF)

Portal Pool Sample (Portal Pool)
Portal Sample (DP, Magenta Drain Portal)
Tunnel Sample (JD, Magenta Drain Portal)

ATTACHMENT C – FLOW SCHEMATIC

No treatment facility currently exists for this discharge. The Discharger is required to submit a treatment flow schematic, including both liquid and solid streams, as part of the workplan required in VI.C.7.a of this Order.

ATTACHMENT D – FEDERAL STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code (CWC) and is grounds for enforcement action, for permit termination, revocation and reissuance, or denial of a permit renewal application [40 CFR §122.41(a)].
2. The Discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not been modified to incorporate the requirement [40 CFR §122.41(a)(1)].

B. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order [40 CFR §122.41(c)].

C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment [40 CFR §122.41(d)].

D. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by a Discharger only when necessary to achieve compliance with the conditions of this Order [40 CFR §122.41(e)].

E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges [40 CFR §122.41(g)].
2. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations [40 CFR §122.5(c)].

F. Inspection and Entry

The Discharger shall allow the Regional Water Quality Control Board (Regional Water Board), State Water Resources Control Board (State Water Board), United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to [40 CFR §122.41(i)] [CWC 13383(c)]:

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order [40 CFR §122.41(i)(1)];
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order [40 CFR §122.41(i)(2)];
3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order [40 CFR §122.41(i)(3)];
4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the CWC, any substances or parameters at any location [40 CFR §122.41(i)(4)].

G. Bypass

1. Definitions
 - a. “Bypass” means the intentional diversion of waste streams from any portion of a treatment facility [40 CFR §122.41(m)(1)(i)].
 - b. “Severe property damage” means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production [40 CFR §122.41(m)(1)(ii)].
2. Bypass not exceeding limitations – The Discharger may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions – Permit Compliance I.G.3, I.G.4, and I.G.5 below [40 CFR §122.41(m)(2)].
3. Prohibition of bypass – Bypass is prohibited, and the Regional Water Board may take enforcement action against a Discharger for bypass, unless [40 CFR §122.41(m)(4)(i)]:

- a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage [40 CFR §122.41(m)(4)(A)];
 - b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance [40 CFR §122.41(m)(4)(B)]; and
 - c. The Discharger submitted notice to the Regional Water Board as required under Standard Provisions – Permit Compliance I.G.5 below [40 CFR §122.41(m)(4)(C)].
4. The Regional Water Board may approve an anticipated bypass, after considering its adverse effects, if the Regional Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above [40 CFR §122.41(m)(4)(ii)].
5. Notice
 - a. Anticipated bypass. If the Discharger knows in advance of the need for a bypass, it shall submit a notice, if possible at least 10 days before the date of the bypass [40 CFR §122.41(m)(3)(i)].
 - b. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below (24-hour notice) [40 CFR §122.41(m)(3)(ii)].

H. Upset

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation [40 CFR §122.41(n)(1)].

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Standard Provisions – Permit Compliance I.H.2 below are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review [40 CFR §122.41(n)(2)].
2. Conditions necessary for a demonstration of upset. A Discharger who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that [40 CFR §122.41(n)(3)]:

- a. An upset occurred and that the Discharger can identify the cause(s) of the upset [*40 CFR §122.41(n)(3)(i)*];
 - b. The permitted facility was, at the time, being properly operated [*40 CFR §122.41(n)(3)(i)*];
 - c. The Discharger submitted notice of the upset as required in Standard Provisions – Reporting V.E.2.b below (24-hour notice) [*40 CFR §122.41(n)(3)(iii)*]; and
 - d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above [*40 CFR §122.41(n)(3)(iv)*].
3. Burden of proof. In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof [*40 CFR §122.41(n)(4)*].

II. STANDARD PROVISIONS – PERMIT ACTION

A. General

This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition [*40 CFR §122.41(f)*].

B. Duty to Reapply

If the Discharger wishes to continue an activity regulated by this Order after the expiration date of this Order, the Discharger must apply for and obtain a new permit [*40 CFR §122.41(b)*].

C. Transfers

This Order is not transferable to any person except after notice to the Regional Water Board. The Regional Water Board may require modification or revocation and reissuance of the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the CWC [*40 CFR §122.41(l)(3)*] [*40 CFR §122.61*].

III. STANDARD PROVISIONS – MONITORING

- A. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity [*40 CFR §122.41(j)(1)*].
- B. Monitoring results must be conducted according to test procedures under 40 CFR Part 136 unless other test procedures have been specified in this Order [*40 CFR §122.41(j)(4)*] [*40 CFR §122.44(i)(1)(iv)*].

IV. STANDARD PROVISIONS – RECORDS

A. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Regional Water Board Executive Officer at any time [40 CFR §122.41(j)(2)].

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements [40 CFR §122.41(j)(3)(i)];
2. The individual(s) who performed the sampling or measurements [40 CFR §122.41(j)(3)(ii)];
3. The date(s) analyses were performed [40 CFR §122.41(j)(3)(iii)];
4. The individual(s) who performed the analyses [40 CFR §122.41(j)(3)(iv)];
5. The analytical techniques or methods used [40 CFR §122.41(j)(3)(v)]; and
6. The results of such analyses [40 CFR §122.41(j)(3)(vi)].

C. Claims of confidentiality for the following information will be denied [40 CFR §122.7(b)]:

1. The name and address of any permit applicant or Discharger [40 CFR §122.7(b)(1)]; and
2. Permit applications and attachments, permits and effluent data [40 CFR §122.7(b)(2)].

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information

The Discharger shall furnish to the Regional Water Board, State Water Board, or USEPA within a reasonable time, any information which the Regional Water Board, State Water Board, or USEPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the Regional Water Board, State Water Board, or USEPA copies of records required to be kept by this Order [40 CFR §122.41(h)] [CWC 13267].

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the Regional Water Board, State Water Board, and/or USEPA shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, and V.B.5 below [40 CFR §122.41(k)].
2. All permit applications shall be signed as follows:
 - a. For a corporation: By a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures [40 CFR §122.22(a)(1)];
 - b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively [40 CFR §122.22(a)(2)]; or
 - c. For a municipality, State, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes: (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of USEPA) [40 CFR §122.22(a)(3)].
3. All reports required by this Order and other information requested by the Regional Water Board, State Water Board, or USEPA shall be signed by a person described in paragraph (b) of this provision, or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - a. The authorization is made in writing by a person described in paragraph (2.) of this provision [40 CFR §122.22(b)(1)];

- b. The authorization specified 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 well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company (a duly authorized representative may thus be either a named individual or any individual occupying a named position) [40 CFR §122.22(b)(2)]; and
 - c. The written authorization is submitted to the Regional Water Board, State Water Board, or USEPA [40 CFR §122.22(b)(3)].
4. If an authorization under paragraph (3.) of this provision is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (3.) of this provision must be submitted to the Regional Water Board, State Water Board, or USEPA prior to or together with any reports, information, or applications, to be signed by an authorized representative [40 CFR §122.22(c)].
 5. Any person signing a document under paragraph (2.) or (3.) of this provision shall make the following certification:

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations” [40 CFR §122.22(d)].

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program (Attachment E) in this Order [40 CFR §122.41(l)(4)].
2. Monitoring results shall be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Regional Water Board or State Water Board [40 CFR §122.41(l)(4)(i)].
3. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under 40 CFR Part 136 or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR specified by the Regional Water Board [40 CFR §122.41(l)(4)(ii)].
4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order [40 CFR §122.41(l)(4)(iii)].

D. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order, shall be submitted no later than 14 days following each schedule date [40 CFR §122.41(l)(5)].

E. Twenty-Four Hour Reporting

1. The Discharger shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the Discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance [40 CFR §122.41(l)(6)(i)].
2. The following shall be included as information that must be reported within 24 hours under this paragraph [40 CFR §122.41(l)(6)(ii)]:
 - a. Any unanticipated bypass that exceeds any effluent limitation in this Order [40 CFR §122.41(l)(6)(ii)(A)].
 - b. Any upset that exceeds any effluent limitation in this Order [40 CFR §122.41(l)(6)(ii)(B)].
3. The Regional Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours [40 CFR §122.41(l)(6)(iii)].

F. Planned Changes

The Discharger shall give notice to the Regional Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when [40 CFR §122.41(l)(1)]:

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR §122.29(b) [40 CFR §122.41(l)(1)(i)]; or
2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in this Order nor to notification requirements under 40 CFR Part 122.42(a)(1) (see Additional Provisions—Notification Levels VII.A.1) [40 CFR §122.41(l)(1)(ii)].
3. The alteration or addition results in a significant change in the Discharger's solids disposal practices, and such alteration, addition, or change may justify the application of permit

conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites [40 CFR §122.41(l)(1)(iii)].

G. Anticipated Noncompliance

The Discharger shall give advance notice to the Regional Water Board or State Water Board of any planned changes in the permitted facility or activity that may result in noncompliance with General Order requirements [40 CFR §122.41(l)(2)].

H. Other Noncompliance

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting V.C, V.D, and V.E above at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.E above [40 CFR §122.41(l)(7)].

I. Other Information

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Water Board, State Water Board, or USEPA, the Discharger shall promptly submit such facts or information [40 CFR §122.41(l)(8)].

VI. STANDARD PROVISIONS – ENFORCEMENT—NOT APPLICABLE

VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS

A. Non-Municipal Facilities

Existing manufacturing, commercial, mining, and silvicultural dischargers shall notify the Regional Water Board as soon as they know or have reason to believe [40 CFR §122.42(a)]:

1. That any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels" [40 CFR §122.42(a)(1)]:
 - a. 100 micrograms per liter ($\mu\text{g/L}$) [40 CFR §122.42(a)(1)(i)];
 - b. 200 $\mu\text{g/L}$ for acrolein and acrylonitrile; 500 $\mu\text{g/L}$ for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and 1 milligram per liter (mg/L) for antimony [40 CFR §122.42(a)(1)(ii)];
 - c. Five (5) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge [40 CFR §122.42(a)(1)(iii)]; or
 - d. The level established by the Regional Water Board in accordance with 40 CFR §122.44(f) [40 CFR §122.42(a)(1)(iv)].

2. That any activity has occurred or will occur that would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following “notification levels” [40 CFR §122.42(a)(2)]:
 - a. 500 micrograms per liter ($\mu\text{g/L}$) [40 CFR §122.42(a)(2)(i)];
 - b. 1 milligram per liter (mg/L) for antimony [40 CFR §122.42(a)(2)(ii)];
 - c. Ten (10) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge [40 CFR §122.42(a)(2)(iii)]; or
 - d. The level established by the Regional Water Board in accordance with 40 CFR §122.44(f) [40 CFR §122.42(a)(2)(iv)].

Attachment E – Monitoring and Reporting Program – Table of Contents

Attachment E – Monitoring and Reporting Program (MRP).....E-2

I. General Monitoring Provisions.....E-2

II. Monitoring Locations.....E-2

III. Influent Monitoring Requirements—*Not Applicable*E-3

IV. Effluent Monitoring RequirementsE-3

A. Monitoring Location EFF-001E-3

V. Whole Effluent Toxicity Testing RequirementsE-5

A. Acute Toxicity TestingE-5

B. Chronic Toxicity Testing.....E-5

C. WET Testing Notification Requirements.....E-6

D. WET Testing Reporting RequirementsE-7

VI. Land Discharge Monitoring Requirements—*Not Applicable*.....E-7

VII. Reclamation Monitoring Requirements—*Not Applicable*.....E-7

VIII. Receiving Water Monitoring Requirements – Surface Water and GroundwaterE-8

A. Monitoring Locations RWS-001, RWS-002, and RWS-003E-8

IX. Other Monitoring RequirementsE-8

A. Solids Monitoring—Monitoring Location SLD-001E-8

X. Reporting RequirementsE-9

A. General Monitoring and Reporting RequirementsE-9

B. Self Monitoring Reports (SMRs)E-9

C. Discharge Monitoring Reports (DMRs)—*Not Applicable*.....E-11

D. Other ReportsE-11

ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

The Code of Federal Regulations (CFR) at 40 CFR §122.48 requires that all NPDES permits specify monitoring and reporting requirements. CWC sections 13267 and 13383 also authorize the Regional Water Quality Control Board (Regional Water Board) to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements which implement the federal and California regulations.

I. GENERAL MONITORING PROVISIONS

- A.** All monitoring and analysis instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary, at least yearly, to ensure their continued accuracy.
- B.** A letter transmitting the self-monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions.
- C.** If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the discharge monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.
- D.** Laboratories analyzing monitoring samples shall be certified by the Department of Health Services, in accordance with the provision of California Water Code Section 13176, and must include quality assurance/quality control data with their reports.

II. MONITORING LOCATIONS

The Discharger shall establish the following monitoring locations to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in this Order:

Discharge Point Name	Monitoring Location Name	Monitoring Location Description
EFF-001	EFF-001	Magenta Drain Portal (39 ° 12' 40.4 " N, 121° 03' 6.6" W)
--	RWS-001	Unnamed tributary to the South Fork of Wolf Creek, at residential footbridge (39 ° 12' 44 " N, 121° 03' 13" W)
--	RWS-002	South Fork of Wolf Creek at intersection of Ophir Street and Highway 174 (39 ° 12' 56 " N, 121° 03' 15" W)
--	RWS-003	South Fork of Wolf Creek near the intersection of Highways 20 and 174 (39 ° 12' 58 " N, 121° 03' 37" W)
--	SLD-001	Solids

III. INFLUENT MONITORING REQUIREMENTS—*NOT APPLICABLE*

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Location EFF-001

1. Effluent samples shall be collected downstream from the last connection through which wastes can be admitted into the outfall, following the last unit process. Effluent samples should be representative of the volume and quality of the discharge. An effort should be made to conduct monitoring during periods of peak flow events and/or noticeable discoloration. Time of collection of samples shall be recorded. The Discharger shall monitor mine drainage from the Empire Mine’s Magenta Drain portal at **EFF-001** as follows:

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method ¹
Flow	mgd	Meter	Continuous ²	
pH	standard units	Meter	Continuous ²	
Turbidity	NTU	Meter	Continuous ²	
Electrical Conductivity	µmhos/cm	Meter	Continuous ²	
Dissolved Oxygen	mg/L, % saturation	Grab	Monthly	
Temperature	°F	Grab	Monthly	
Total Dissolved Solids	mg/L, lbs/day	Grab	Monthly	
Total Suspended Solids	mg/L, lbs/day	24-Hour Composite	Monthly	
Settleable Solids	mL/L-hr	24-Hour Composite	Monthly	
Hardness (as CaCO ₃)	mg/L, lbs/day	24-Hour Composite	Monthly	
Color	color units	Grab	Monthly	
Aluminum, Acid-Soluble ³	µg/L, lbs/day	24-Hour Composite	Monthly	
Antimony, Total Recoverable	µg/L, lbs/day	24-Hour Composite	Monthly	
Arsenic, Total Recoverable	µg/L, lbs/day	24-Hour Composite	Monthly	

¹ See Attachment G for suggested test methods.

² Continuous monitoring is required to begin no later than **1 May 2010**. Until continuous monitoring begins, monitoring shall be conducted weekly.

³ Acid-soluble or total. Aluminum samples may be analyzed using the acid-soluble method described in USEPA’s *Ambient Water Quality Criteria for Aluminum – 1988* [EPA 440/5-86-008], with the modification that an inductively coupled plasma/mass spectrometry (ICP/MS) analysis be substituted for the ICP/atomic emission spectrometric (ICP/AES) analysis, or other standard methods that exclude aluminum silicate particles as approved by the Executive Officer.

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method ¹
Barium, Total Recoverable	µg/L, lbs/day	24-Hour Composite	Monthly	
Cadmium, Total Recoverable	µg/L, lbs/day	24-Hour Composite	Monthly	
Chromium, Total Recoverable	µg/L, lbs/day	24-Hour Composite	Monthly	
Chromium, Hexavalent	µg/L, lbs/day	Grab	Monthly	
Cobalt, Total Recoverable	µg/L, lbs/day	24-Hour Composite	Monthly	
Copper, Total Recoverable	µg/L, lbs/day	24-Hour Composite	Monthly	
Iron, Total Recoverable	µg/L, lbs/day	24-Hour Composite	Monthly	
Lead, Total Recoverable	µg/L, lbs/day	24-Hour Composite	Monthly	
Manganese, Total Recoverable	µg/L, lbs/day	24-Hour Composite	Monthly	
Mercury, Total Recoverable	µg/L, lbs/day	24-Hour Composite	Monthly	
Nickel, Total Recoverable	µg/L, lbs/day	24-Hour Composite	Monthly	
Thallium, Total Recoverable	µg/L, lbs/day	24-Hour Composite	Monthly	
Vanadium, Total Recoverable	µg/L, lbs/day	24-Hour Composite	Monthly	
Zinc, Total Recoverable	µg/L, lbs/day	24-Hour Composite	Monthly	
Beryllium, Total recoverable	µg/L, lbs/day	24-Hour Composite	Quarterly	
Cyanide, Total Recoverable	µg/L, lbs/day	Grab	Quarterly	
Mercury, Methyl	µg/L, lbs/day	Grab	Quarterly	
Molybdenum, Total Recoverable	µg/L, lbs/day	24-Hour Composite	Quarterly	
Selenium, Total Recoverable	µg/L, lbs/day	24-Hour Composite	Quarterly	
Sulfate	mg/L, lbs/day	Grab	Quarterly	
Acute Toxicity	% survival	Grab ⁴	4	4
Chronic Toxicity	--	Grab ⁴	4	4

⁴ As specified in Whole Effluent Toxicity Testing Requirements.

2. If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all of the constituents listed above, except for priority pollutants, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge. In no event shall the Discharger be required to monitor and record data more often than twice the frequencies listed in the schedule.

V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

A. Acute Toxicity Testing.

The Discharger shall conduct acute toxicity testing to determine whether the effluent is contributing acute toxicity to the receiving water. The Discharger shall meet the following acute toxicity testing requirements:

1. Monitoring Frequency – the Discharger shall perform acute toxicity testing two quarters per year, alternating quarters with chronic toxicity testing, and concurrent with effluent inorganics and hardness sampling.
2. Sample Types – For static non-renewal and static renewal testing, the samples shall be 24-hour, flow-proportional composites and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at the effluent monitoring location EFF-001.
3. Test Species – Test species shall be larval stage (0 to 14 days old) rainbow trout (*Oncorhynchus mykiss*).
4. Methods – The acute bioassays tests shall be conducted in accordance with EPA-821-R-02-012, Fifth Edition, or later amendment with Executive Officer approval. Temperature and pH shall be recorded at the time of sample collection. No pH adjustment may be made unless approved by the Executive Officer.
5. Test Failure – If an acute toxicity test does not meet all test acceptability criteria, as specified in the test method, the Discharger must re-sample and re-test as soon as possible, not to exceed seven (7) business days following notification of test failure.

B. Chronic Toxicity Testing.

The Discharger shall conduct three species chronic toxicity testing to determine whether the effluent is contributing chronic toxicity to the receiving water. The Discharger shall meet the following chronic toxicity testing requirements:

1. Monitoring Frequency – the Discharger shall perform three-species, chronic toxicity testing two quarters per year, alternating quarters with acute toxicity testing.
2. Sample Types – Effluent samples shall be flow-proportional, 24-hour composites and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at the effluent monitoring location specified in the Monitoring and Reporting Program.
3. Sample Volumes – Adequate sample volumes shall be collected to provide renewal water to complete the test in the event that the discharge is intermittent.

4. Test Species – Chronic toxicity testing measures sublethal (e.g. reduced growth, reproduction) and/or lethal effects to test organisms exposed to an effluent compared to that of the control organisms. The Discharger shall conduct chronic toxicity tests with:
 - a. The cladoceran, water flea, *Ceriodaphnia dubia* (survival and reproduction test);
 - b. The fathead minnow, *Pimephales promelas* (larval survival and growth test); and
 - c. The green alga, *Selenastrum capricornutum* (growth test).
5. Methods – The presence of chronic toxicity shall be estimated as specified in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition*, EPA/821-R-02-013, October 2002, or later amendment with Executive Officer approval.
6. Reference Toxicant – As required by the SIP, all chronic toxicity tests shall be conducted with concurrent testing with a reference toxicant and shall be reported with the chronic toxicity test results.
7. Dilutions – The chronic toxicity testing shall be performed using the dilution series identified below.

Chronic Toxicity Testing Dilution Series		
Sample	Dilutions (%)	Control
	100	Laboratory Water
% Effluent	100	0
% Laboratory Water	0	100

8. Test Failure –The Discharger must re-sample and re-test as soon as possible, but no later than fourteen (14) days after receiving notification of a test failure. A test failure is defined as follows:
 - a. The reference toxicant test or the effluent test does not meet all test acceptability criteria as specified in the *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition*, EPA/821-R-02-013, October 2002 (Method Manual), and its subsequent amendments or revisions; or
 - b. The percent minimum significant difference (PMSD) measured for the test exceeds the upper PMSD bound variability criterion in Table 6 on page 52 of the Method Manual.

C. WET Testing Notification Requirements

The Discharger shall notify the Regional Water Board within 24 hours after the receipt of test results showing significant reductions in test endpoint results from the control, or an exceedance of the acute toxicity effluent limitation.

D. WET Testing Reporting Requirements

All toxicity test reports shall include the contracting laboratory's complete report provided to the Discharger and shall be in accordance with the appropriate "Report Preparation and Test Review" sections of the method manuals. At a minimum, whole effluent toxicity monitoring shall be reported as follows:

1. **Chronic WET Reporting.** Regular chronic toxicity monitoring results shall be reported to the Regional Water Board within 30 days following completion of the test, and shall contain, at minimum:
 - a. The statistical methods used to calculate endpoints;
 - b. The statistical output page, which includes the calculation of the percent minimum significant difference (PMSD);
 - c. The dates of sample collection and initiation of each toxicity test; and

Additionally, the monthly discharger self-monitoring reports shall contain an updated chronology of chronic toxicity test results, and organized by test species, type of test (survival, growth or reproduction), and monitoring frequency, *i.e.*, either quarterly, monthly, or TRE.

2. **Acute WET Reporting.** Acute toxicity test results shall be submitted with the monthly discharger self-monitoring reports and reported as percent survival.
3. **TRE Reporting.** Reports for Toxicity Reduction Evaluations shall be submitted in accordance with the schedule contained in the Discharger's approved TRE Work Plan.
4. **Quality Assurance (QA).** The Discharger must provide the following information for QA purposes:
 - a. Results of the applicable reference toxicant data with the statistical output page giving the species, NOEC, LOEC, type of toxicant, dilution water used, concentrations used, PMSD, and dates tested.
 - b. The reference toxicant control charts for each endpoint, which include summaries of reference toxicant tests performed by the contracting laboratory.
 - c. Any information on deviations or problems encountered and how they were dealt with.

VI. LAND DISCHARGE MONITORING REQUIREMENTS—*NOT APPLICABLE*

VII. RECLAMATION MONITORING REQUIREMENTS—*NOT APPLICABLE*

VIII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER AND GROUNDWATER

A. Monitoring Locations RWS-001, RWS-002, and RWS-003

1. An effort should be made to conduct monitoring during periods of peak flow events and/or noticeable discoloration. The Discharger shall monitor **the unnamed tributary to the South Fork of Wolf Creek** and the **South Fork of Wolf Creek** at **RWS-001, RWS-002, and RWS-003** as follows:

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Dissolved Oxygen	mg/L	Grab	Monthly	1
	% saturation	Grab	Monthly	1
Electrical Conductivity	µmhos/cm	Grab	Monthly	1
pH	standard units	Grab	Monthly	1
Temperature	°F	Grab	Monthly	1
Turbidity	NTU	Grab	Monthly	
Color	color units	Grab	Monthly	
Hardness (as CaCO ₃)	mg/L	Grab	Monthly	
Radionuclides	pCi/L	Grab	Annually	

¹ A hand-held field meter may be used, provided the meter utilizes a USEPA-approved algorithm/method and is calibrated and maintained in accordance with the manufacturer’s instructions. A calibration and maintenance log for each meter used for monitoring required by this Monitoring and Reporting Program shall be maintained on-site.

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by Stations RWS-001 and RWS-003. Attention shall be given to the presence or absence of:

- | | |
|---------------------------------|--|
| a. Floating or suspended matter | e. Visible films, sheens or coatings |
| b. Discoloration | f. Fungi, slimes, or objectionable growths |
| c. Bottom deposits | g. Potential nuisance conditions |
| d. Aquatic life | |

Notes on receiving water conditions shall be summarized in the monitoring report.

IX. OTHER MONITORING REQUIREMENTS

A. Solids Monitoring—Monitoring Location SLD-001

1. A composite sample of solids shall be collected when solids are removed for disposal, and tested for the metals listed in Title 22.
2. Sampling records shall be retained for a minimum of **five years**. A log shall be kept of solids quantities generated and of handling and disposal activities.

X. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.
2. The Discharger shall report to the Regional Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986".
3. In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the reported analytical result are readily discernible. The data shall be summarized in such a manner to clearly illustrate whether the discharge complies with waste discharge requirements. Monthly maximums, minimums, and averages shall be reported for each monitored constituent and parameter. All periodic averages for which there are limitations shall also be calculated and reported.
4. With the exception of flow, all constituents monitored on a continuous basis (metered), shall be reported as daily maximums, daily minimums, and daily averages; flow shall be reported as the total volume discharged per day for each day of discharge.

B. Self Monitoring Reports (SMRs)

1. At any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (<http://www.waterboards.ca.gov/ciwqs/index.html>). Until such notification is given, the Discharger shall submit hard copy SMRs in accordance with the requirements described in subsection B.5 below. The CIWQS Web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.
2. The Discharger shall report in the SMR the results for all monitoring specified in this MRP under sections III through IX. Additionally, the Discharger shall report in the SMR the results of any special studies, acute and chronic toxicity testing, TRE/TIE, required by Special Provisions –VI.C.2 of this Order. The Discharger shall submit monthly SMRs including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. If the Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.

3. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Sampling Frequency	Monitoring Period Begins On...	Monitoring Period	SMR Due Date
Continuous	1 May 2010	All	Submit with monthly SMR
Weekly	6 August 2006	Sunday through Saturday	Submit with monthly SMR
Monthly	1 August 2006	1 st day of calendar month through last day of calendar month	32 days from the end of the monitoring period
Quarterly	1 October 2006	January 1 through March 31 April 1 through June 30 July 1 through September 30 October 1 through December 31	32 days from the end of the monitoring period
Semiannually	1 January 2007	January 1 through June 30 July 1 through December 31	32 days from the end of the monitoring period
Annually	1 January 2007	January 1 through December 31	32 days from the end of the monitoring period
Once per Disposal	1 August 2006	--	Submit with monthly SMR

4. Reporting Protocols. The Discharger shall report with each sample result the applicable Reporting Level (RL) and the current Method Detection Limit (MDL), as determined by the procedure in 40 CFR Part 136.

The Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

- a. Sample results greater than or equal to the RL shall be reported as measured by the laboratory (*i.e.*, the measured chemical concentration in the sample).
- b. Sample results less than the RL, but greater than or equal to the laboratory’s MDL, shall be reported as “Detected, but Not Quantified,” or DNQ. The estimated chemical concentration of the sample shall also be reported.

For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words “Estimated Concentration” (may be shortened to “Est. Conc.”). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (\pm a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

- c. Sample results less than the laboratory’s MDL shall be reported as “Not Detected,” or ND.
- d. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from *extrapolation* beyond the lowest point of the calibration curve.

5. The Discharger shall submit hard copy SMRs (with an original signature) when required by subsection B.1 above in accordance with the following requirements:
 - a. The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with interim and/or final effluent limitations.
 - b. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify violations of the WDRs; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.
 - c. SMRs must be submitted to the Regional Water Board, signed and certified as required by the Standard Provisions (Attachment D), to the address listed below:

California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, #200
Rancho Cordova, CA 95670

C. Discharge Monitoring Reports (DMRs)—*Not Applicable*

D. Other Reports

1. By **1 February** of each year, the Discharger shall submit a written report to the Executive Officer containing the following:
 - a. The names, titles, general responsibilities, and telephone numbers of persons to contact regarding the facility for emergency and routine situations.
 - b. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration.
 - c. A statement certifying whether the current operation and maintenance manual, and contingency plan, reflect the wastewater treatment plant as currently constructed and operated, and the dates when these documents were last revised and last reviewed for adequacy.
 - d. The Discharger may also be requested to submit an annual report to the Regional Water Board with both tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the compliance record. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

Attachment F – Fact Sheet – Table of Contents

Attachment F – Fact Sheet..... F-3

I. Permit Information..... F-3

II. Facility Description..... F-4

A. Description of Wastewater and Biosolids Treatment or Controls..... F-6

B. Discharge Points and Receiving Waters F-6

C. Summary of Existing Requirements and Self-Monitoring Report (SMR) Data—*Not Applicable*..... F-6

D. Compliance Summary—*Not Applicable* F-6

E. Planned Changes F-7

III. Applicable Plans, Policies, and Regulations..... F-7

A. Legal Authorities..... F-7

B. California Environmental Quality Act (CEQA)..... F-7

C. State and Federal Regulations, Policies, and Plans F-7

D. Impaired Water Bodies on CWA 303(d) List F-12

E. Other Plans, Policies, and Regulations—*Not Applicable*..... F-13

IV. Rationale For Effluent Limitations and Discharge Specifications F-13

A. Discharge Prohibitions F-14

B. Technology-Based Effluent Limitations F-14

 1. Scope and Authority F-14

 2. Applicable Technology-Based Effluent Limitations F-15

C. Water Quality-Based Effluent Limitations (WQBELs) F-18

 1. Scope and Authority F-18

 2. Applicable Beneficial Uses and Water Quality Criteria and Objectives F-18

 3. Determining the Need for WQBELs..... F-20

 4. WQBEL Calculations F-32

 5. Whole Effluent Toxicity (WET)..... F-38

D. Final Effluent Limitations F-38

E. Interim Effluent Limitations..... F-42

F. Land Discharge Specifications—*Not Applicable*..... F-43

G. Reclamation Specifications—*Not Applicable* F-43

V. Rationale for Receiving Water Limitations F-43

A. Surface Water F-43

B. Groundwater—*Not Applicable*..... F-45

VI. Rationale for Monitoring and Reporting Requirements F-45

A. Influent Monitoring—*Not Applicable* F-45

B. Effluent Monitoring..... F-45

C. Whole Effluent Toxicity Testing Requirements F-47

D. Receiving Water Monitoring..... F-48

 1. Surface Water..... F-48

 2. Groundwater—*Not Applicable* F-48

E. Other Monitoring Requirements—*Not Applicable* F-48

VII. Rationale for Provisions..... F-48

A. Standard Provisions F-48

B. Special Provisions F-48

 1. Reopener Provisions F-48

- 2. Special Studies and Additional Monitoring Requirements..... F-49
- 3. Best Management Practices and Pollution Prevention F-51
- 4. Construction, Operation, and Maintenance Specifications..... F-52
- 5. Special Provisions for Municipal Facilities (POTWs Only)—*Not Applicable* F-52
- 6. Other Special Provisions..... F-52
- 7. Compliance Schedules F-53
- VIII. Public Participation**..... F-54
 - A.** Notification of Interested Parties..... F-54
 - B.** Written Comments F-54
 - C.** Public Hearing..... F-55
 - D.** Waste Discharge Requirements Petitions..... F-55
 - E.** Information and Copying F-55
 - F.** Register of Interested Persons F-55
 - G.** Additional Information..... F-55

ATTACHMENT F – FACT SHEET

As described in Section II of this Order, this Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

This Order regulates the discharge of mine drainage from the Magenta Drain Tunnel of the Empire Mine State Historic Park. This Order includes effluent, solids, and surface water limitations, monitoring and reporting requirements, additional study requirements, and reopener provisions for effluent constituents.

I. PERMIT INFORMATION

The following table summarizes administrative information related to the facility.

WDID	5A29NP00006
Discharger	State of California, Department of Parks and Recreation
Name of Facility	Empire Mine State Historic Park, Grass Valley
Facility Address	10556 East Empire Street
	Grass Valley, CA 95945
	Nevada County
Facility Contact, Title and Phone	Sector Superintendent, (530) 273-3884
Authorized Person to Sign and Submit Reports	
Mailing Address	Same as Facility Address
Billing Address	Same as Facility Address
Type of Facility	Industrial Standard Industrial Classification (SIC) Code: 1041 North American Industry Classification System (NAICS) Code: 212221
Major or Minor Facility	Minor
Threat to Water Quality	Category 1
Complexity	Category A
Pretreatment Program	Not Applicable
Reclamation Requirements	Not Applicable
Facility Permitted Flow	Not Applicable
Facility Design Flow	Not Available
Watershed	Wolf Creek Hydrologic Subarea, Upper Bear River Hydrologic Area, Bear River Hydrologic Unit
Receiving Water	Unnamed Tributary to South Fork of Wolf Creek
Receiving Water Type	Inland Surface Water

- A. The State of California, Department of Parks and Recreation (hereinafter Discharger) is the owner and operator of the Empire Mine State Historic Park (hereinafter Facility), a historic gold mine.
- B. The Facility discharges mine drainage to an unnamed tributary to the South Fork of Wolf Creek, a water of the United States.
- C. The Discharger filed a report of waste discharge and submitted an application for renewal of its Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permit on 23 September 2005. A site visit was conducted on 19 January 2006 to collect additional data to develop permit limitations and conditions.

II. FACILITY DESCRIPTION

According to the Discharger (USEPA Form 1, Section XII. Nature of Business), “[t]he *Empire Mine State Historic Park consists of 856 acres of historic mine workings and buildings, a Visitor Center, and forested backcountry, with eight miles of trails. Park activities include: guided tours; audio-visual presentations; living history programs; picnicking; hiking; mountain biking; and horseback riding. There are no active industrial mining or mine processing activities, nor have there been since the mine closed in 1956. Discharge from the Magenta Drain Portal was a historic discharge to dewater the mine during its operation. The current source of the discharge is still under investigation.*”

The site is located on the western slope of the north-central Sierra Nevada mountains, approximately 50 miles northeast of Sacramento in Nevada County. The two irregularly shaped areas comprising the site straddle East Empire Street and Highway 174, east of Highway 49 and Wolf Creek and adjoin with the city of Grass Valley.

During the operating life of the mine, waste rock and slurry from the milling process was stockpiled south of the former Cyanide Plant or allowed to runoff in the drainage below the Cyanide Plant. Piles of waste rock were deposited, and still remain, in several areas of the site.

The Cyanide Plant is a historical structure; at present, all that remains is the building foundation. The Cyanide Plant area included a stamp mill where the ore-bearing rock was crushed. Processing at the plant consisted of adding sodium cyanide to crushed ore to dissolve and separate the gold from sulfides, and deposit it as a coating on zinc chips. The resulting material was mixed with purifying chemicals and heated in the furnace at the Empire Mine Refinery. The mill tailings were also stockpiled adjacent to the Cyanide Plant and also washed into the adjacent drainage leading to the Sand Dam impoundment.

There is a distinction between mine spoils from underground mining activities and mill tailings that have been processed through the stamp mill and Cyanide Plant.

Mill tailings are fine-grained (sand size or smaller), resulting in a greater surface area for leaching of metals. The presence of naturally-occurring sulfides (mainly pyrite and arsenopyrite) can lead to the formation of sulfuric acid, creating acid conditions that increase the leaching of metals (arsenic, iron, lead, *etc.*) from the mill tailings material. In addition, the mill tailings material may contain

non-naturally occurring inorganic contaminants such as mercury and cyanide, residuals from the gold extraction process. Mine spoils contains the non-ore-bearing rocks and soil that are removed during mining and tunneling operations. This material was not processed, as it does not contain economically significant ores. It is generally coarser-grained than the mill tailings.

The Discharger obtained coverage under the General Permit for Discharges of Storm Water Associated with Industrial Activities by submitting a Notice of Intent to Comply with the Terms of the Permit (NOI) to the State Water Resources Control Board on 28 June 2005 for exposed mine tailings. The Discharger also obtained coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity for the Public Mine Tour Tunnel Project. State Water Resources Control Board staff processed the NOI for this project on 2 December 2005. The Discharger has developed Storm Water Pollution Prevention Plans to comply with these permits, and is in the process of evaluating and revising the plans.

The discharge of mine drainage from the Empire Mine State Historic Park's Magenta Drain to surface water was discovered by Regional Water Board and City of Grass Valley staff following an investigation into a complaint by downstream residents that Wolf Creek was discolored.

On 17 January 2002, Regional Water Board staff received a call from City of Grass Valley staff relaying a complaint received from a resident downstream of the City's wastewater treatment plant (WWTP) that Wolf Creek was running orange. City staff stated that the mine at the WWTP was contained and not contributing to discoloration, and that Wolf Creek was discolored upstream of the WWTP discharge as well. City staff investigated the source of the discharge and traced it upstream to the Empire Mine; according to City staff, the mine was discharging "brilliant red water". Copies of photographs taken the day of the complaint were transmitted to Regional Water Board staff.

In a letter dated 5 February 2002, Regional Water Board staff advised the Discharger that if water from the mine had been discharged, a report of waste discharge was required in accordance with California Water Code section 13376.

On 25 February 2002, Regional Water Board staff received the Discharger's laboratory results of a sample of the water from the Magenta Drain collected on 30 January 2002. The analytical results showed that the sample of water from the Magenta Drain contained 77.2 µg/L of total recoverable arsenic, 5,870 µg/L of total recoverable iron and had a pH of 6.8 pH units.

On 5 March 2002, Regional Water Board staff visited the site. It was determined that the discolored water in the Magenta Drain originated from the Empire Mine State Park property and that the headwaters of the Magenta Drain originate within the Park.

In a letter dated 15 April 2002, Regional Water Board staff requested the Discharger to complete a technical report and investigate the source of the water in the Magenta Drain with elevated concentrations of arsenic and iron and that a workplan for completion of the technical report be submitted by 31 May 2002. The letter also required the Discharger to submit a Notice of Intent to comply with the State Water Board's General NPDES stormwater permit for industrial dischargers within 30 days of the date of the letter and advised the Discharger that a portal discharge would require separate regulation by an individual NPDES permit.

In a letter dated 22 April 2002, the Discharger responded and stated that it “*respectfully decline[d] from applying for either the stormwater or the wastewater discharge permits.*”

The Regional Water Board, on 17 December 2004 issued an order pursuant to California Water Code section 13267 (13267 Order) requiring the Discharger to submit a technical report, including a report of waste discharge to apply for an NPDES permit for discharges from the Magenta Drain Tunnel. The Discharger submitted a report of waste discharge, dated 23 September 2005, to comply with the 13267 Order.

The Empire Mine site is drained by Little Wolf Creek to the south and numerous, unnamed ephemeral creeks to the north and west. The Magenta Drain Tunnel discharges to the headwaters of one of these unnamed ephemeral creeks that drains to the northwest toward the South Fork of Wolf Creek.

Discolored sediments are visible in the streambed from the Magenta Drain Tunnel portal, through the length of the City of Grass Valley’s Veterans Memorial Park to a point where the stream has been diverted underground. The sediments from the portal discharge have been previously characterized as exceeding the Title 22 soluble threshold limit concentration for arsenic. A report prepared by a consultant for the Discharger concluded the sediments were hazardous and should be removed with proper disposal.

A. Description of Wastewater and Biosolids Treatment or Controls

No treatment is currently provided for this discharge. Provision VI.C.7.a includes a schedule for compliance for limitations contained in Effluent Limitations IV.A.1.

B. Discharge Points and Receiving Waters

1. The Magenta Drain discharge surfaces in Section 35, T16N, R8E, MDB&M, as shown on Attachment B, a part of this Order. Mine drainage is discharged to an unnamed tributary to the South Fork of Wolf Creek, a water of the United States, and tributary to the South Fork of Wolf Creek, thence Wolf Creek, thence the Bear River, at the point(s), latitude 39 deg, 12 min, 40.4 sec N (deg, min, sec) and longitude 121 deg, 03 min, 06.6 W (deg, min, sec).
2. Mine drainage is discharged to an unnamed tributary to the South Fork of Wolf Creek, which is tributary the South Fork of Wolf Creek, Wolf Creek, and the Bear River.

C. Summary of Existing Requirements and Self-Monitoring Report (SMR) Data—*Not Applicable*

D. Compliance Summary—*Not Applicable*

E. Planned Changes

1. In order to achieve compliance with the terms and conditions of this Order, some action(s) will need to be undertaken within the compliance period granted. This Order contains Provisions and schedules requiring the Discharger to determine and implement a means of compliance.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in the proposed Order are based on the requirements and authorities described in this section.

A. Legal Authorities

This Order is issued pursuant to section 402 of the Federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (USEPA) and Chapter 5.5, Division 7 of the California Water Code (CWC). It shall serve as a NPDES permit for point source discharges from this facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to Article 4, Chapter 4 of the CWC for discharges that are not subject to regulation under CWA section 402.

B. California Environmental Quality Act (CEQA)

The action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000, *et seq.*), requiring preparation of an environmental impact report or negative declaration in accordance with Section 13389 of the California Water Code.

C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plans.** The Regional Water Board adopted a *Water Quality Control Plan, Fourth Edition*, 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. In addition, State Water Resources Control Board (State Water Board) Resolution No. 88-63 requires that, with certain exceptions, the Regional Water Board assign the municipal and domestic supply use to water bodies that do not have beneficial uses listed in the Basin 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 the unnamed tributary to the South Fork of Wolf Creek, but does identify present and potential uses for the Bear River, to which the unnamed tributary to the South Fork of Wolf Creek, via the South Fork of Wolf Creek and Wolf Creek, is tributary. These beneficial uses are as follows: municipal and domestic supply, agricultural irrigation and stockwatering, hydropower generation, water contact recreation (including canoeing and rafting), non-contact water recreation, warm freshwater aquatic habitat, cold freshwater

aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat, cold spawning habitat, and wildlife habitat. In addition, State Water Resources Control Board (State Water Board) Resolution No. 88-63 requires that, with certain exceptions, the Regional Water Board assign the municipal and domestic supply use to water bodies that do not have beneficial uses listed in the Basin Plan. Thus, as discussed in detail in the Fact Sheet ([Attachment F](#)), beneficial uses applicable to the unnamed tributary to the South Fork of Wolf Creek are as follows:

Discharge Point	Receiving Water Name	Beneficial Use(s)
EFF-001	Unnamed Tributary to the South Fork of Wolf Creek	<p><u>Existing:</u> Municipal and domestic supply (MUN); agricultural supply, including stock watering (AGR); hydropower generation (POW); water contact recreation, including canoeing and rafting (REC-1); non-contact water recreation, including aesthetic enjoyment (REC-2); warm freshwater habitat (WARM); cold freshwater habitat (COLD); and wildlife habitat (WILD).</p> <p><u>Potential:</u> Warm migration of aquatic organisms (MGR); cold migration of aquatic organisms (MGR); warm spawning, reproduction, and/or early development (SPWN); and cold spawning, reproduction, and /or early development (SPWN);</p> <p><u>Groundwater:</u> Municipal and domestic water supply (MUN), industrial service supply (IND), industrial process supply (PRO), and agricultural supply (AGR).</p>

The Basin Plan on page II-1.00 states: *“Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning...” and with respect to disposal of wastewaters states that “...disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses.”*

The federal CWA, Section 101(a)(2), states: *“it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and for recreation in and on the water be achieved by July 1, 1983.”* Federal Regulations, developed to implement the requirements of the CWA, create a rebuttable presumption that all waters be designated as fishable and swimmable. Federal Regulations, 40 CFR §§ 131.2 and 131.10, require that all waters of the State be regulated to protect the beneficial uses of public water supply, protection and propagation of fish, shell fish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation. Section 131.3(e), 40 CFR, defines existing beneficial uses as those uses actually attained after 28 November 1975, whether or not they are included in the water quality standards. Federal Regulation, 40 CFR § 131.10, requires that uses be obtained by implementing effluent limitations, requires that all downstream uses be protected and states that in no case shall a state adopt waste transport or waste assimilation as a beneficial use for any waters of the United States.

In reviewing whether the existing and/or potential uses of the Bear River apply to the unnamed tributary to the South Fork of Wolf Creek, the Regional Water Board has considered the following facts:

a. Domestic Supply and Agricultural Supply

The Regional Water Board is required to apply the beneficial uses of municipal and domestic supply to the unnamed tributary to the South Fork of Wolf Creek based on State Water Board Resolution No. 88-63 which was incorporated in the Basin Plan pursuant to Regional Water Board Resolution No. 89-056. In addition, the State Water Resources Control Board (State Water Board) has issued water rights to existing water users along Wolf Creek downstream of the discharge for domestic and stockwatering uses and along both Wolf Creek and the Bear River downstream of the discharge for irrigation uses. Since the South Fork of Wolf Creek is an ephemeral/low-flow stream, the South Fork of Wolf Creek likely provides groundwater recharge during periods of low flow. The groundwater is a source of drinking water. In addition to the existing water uses, growth in the area, downstream of the discharge is expected to continue, which presents a potential for increased domestic and agricultural uses of the water in the unnamed tributary to the South Fork of Wolf Creek, the South Fork of Wolf Creek, and Wolf Creek.

b. Water Contact and Noncontact Recreation and Esthetic Enjoyment

The Regional Water Board finds that the discharge flows through residential areas and State and City parks, there is ready public access to the unnamed tributary to the South Fork of Wolf Creek, exclusion of the public is unrealistic and contact recreational activities currently exist along the unnamed tributary to the South Fork of Wolf Creek and downstream waters and these uses are likely to increase as the population in the area grows. Wolf Creek and the Bear River also offer recreational opportunities.

c. Freshwater Replenishment

When water is present in the unnamed tributary to the South Fork of Wolf Creek, there is hydraulic continuity between the unnamed tributary to the South Fork of Wolf Creek, the South Fork of Wolf Creek, Wolf Creek, and the Bear River. During periods of hydraulic continuity, the unnamed tributary to the South Fork of Wolf Creek adds to the water quantity and may impact the quality of water flowing down stream in the South Fork of Wolf Creek, Wolf Creek, and the Bear River.

d. Preservation and Enhancement of Fish, Wildlife, and Other Aquatic Resources

The unnamed tributary to the South Fork of Wolf Creek flows to the South Fork of Wolf Creek, Wolf Creek, and the Bear River. The California Department of Fish and Game (DFG) has verified that the fish species present in Wolf Creek and downstream waters are consistent with both cold and warm water fisheries and that rainbow and brown trout, both cold water species, have been found in the vicinity of the City of Grass Valley's wastewater treatment plant. The Basin Plan (Table II-1) designates the Bear River as

being both a cold and warm freshwater habitat. Therefore, pursuant to the Basin Plan (Table II-1, Footnote (2)), the cold designation applies to Wolf Creek, the South Fork of Wolf Creek, and the unnamed tributary to the South Fork of Wolf Creek. The cold-water habitat designation necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/L.

Upon review of the flow conditions, habitat values, and beneficial uses of the unnamed tributary to the South Fork of Wolf Creek, and the facts described above, the Regional Water Board finds that the beneficial uses identified in the Basin Plan for the Bear River are applicable to the unnamed tributary to the South Fork of Wolf Creek.

The Regional Water Board also finds that based on the available information and on the Discharger's application, that the unnamed tributary to the South Fork of Wolf Creek, absent the discharge, is an ephemeral/low-flow stream. The ephemeral nature of unnamed tributary to the South Fork of Wolf Creek means that the designated beneficial uses must be protected, but that no credit for receiving water dilution is available. Although the discharge, at times, maintains the aquatic habitat, constituents may not be discharged that may cause harm to aquatic life. At other times, natural flows within unnamed tributary to the South Fork of Wolf Creek help support the aquatic life. Both conditions may exist within a short time span, where unnamed tributary to the South Fork of Wolf Creek would be dry without the discharge and periods when sufficient background flows provide hydraulic continuity with the South Fork of Wolf Creek, Wolf Creek, and the Bear River. Dry conditions occur primarily in the summer months, but dry conditions may also occur throughout the year, particularly in low rainfall years. The lack of dilution results in more stringent effluent limitations to protect contact recreational uses, drinking water standards, agricultural water quality goals and aquatic life. Significant dilution may occur during and immediately following high rainfall events.

2. ***National Toxics Rule (NTR) and California Toxics Rule (CTR)***. USEPA adopted the NTR on 22 December 1992, which was amended on 4 May 1995 and 9 November 1999, and the CTR on 18 May 2000, which was amended on 13 February 2001. These rules include water quality criteria for priority pollutants and are applicable to this discharge.
3. ***State Implementation Policy***. On 2 March 2000, State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on 28 April 2000, with respect to the priority pollutant criteria promulgated for California by the USEPA through the NTR and to the priority pollutant objectives established by the Regional Water Board in the Basin Plan. The SIP became effective on 18 May 2000 with respect to the priority pollutant criteria promulgated by the USEPA through the California Toxics Rule. The State Water Board adopted amendments to the SIP on 24 February 2005 that became effective on 13 July 2005.
4. ***Alaska Rule***. On 30 March 2000, USEPA revised its regulation that specifies when new and revised State and Tribal water quality standards (WQS) become effective for CWA purposes (40 CFR 131.21, 65 FR 24641, 27 April 2000). Under the revised regulation (also known as the Alaska rule), new and revised standards submitted to USEPA after 30 May 2000, must be

approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by 30 May 2000, may be used for CWA purposes, whether or not approved by USEPA.

5. ***Stringency of Requirements for Individual Pollutants.*** This Order contains restrictions on individual pollutants that are no more stringent than required by the federal CWA. Individual pollutant restrictions consist of technology-based restrictions and water quality-based effluent limitations. The technology-based effluent limitations consist of restrictions on total suspended solids. Restrictions on total suspended solids are specified in federal regulations as discussed in 40 CFR 440.102, and the permit's technology-based pollutant restrictions are no more stringent than required by the CWA. Water quality-based effluent limitations have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. To the extent that toxic pollutant water quality-based effluent limitations were derived from the CTR, the CTR is the applicable standard pursuant to 40 CFR 131.38. The scientific procedures for calculating the individual water quality-based effluent limitations are based on the CTR-SIP, which was approved by USEPA on 18 May 2000. All beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by USEPA prior to 30 May 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to 30 May 2000, but not approved by USEPA before that date, are nonetheless "*applicable water quality standards for purposes of the CWA*" pursuant to 40 CFR 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the technology-based requirements of the CWA and the applicable water quality standards for purposes of the CWA.
6. ***Antidegradation Policy.*** Section 131.12 of 40 CFR requires that State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution 68-16, which incorporates the requirements of the federal antidegradation policy. Resolution 68-16 requires that existing water quality is maintained unless degradation is justified based on specific findings. As discussed in detail in this Fact Sheet, the permitted discharge is consistent with the antidegradation provision of 40 CFR §131.12 and State Water Board Resolution 68-16.

This Order imposes effluent limitations on the existing discharge for the first time. The primary means of compliance are (1) treatment of waste stream to comply with effluent limitations and (2) cessation of discharge. Implementation of either alternative would result in improved water quality downstream of the existing discharge, thereby complying with the antidegradation provision of 40 CFR §131.12 and State Water Board Resolution 68-16.

The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.

7. ***Anti-Backsliding Requirements.*** Sections 402(o)(2) and 303(d)(4) of the CWA and 40 CFR §122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed.
8. ***Monitoring and Reporting Requirements.*** Section 122.48 of 40 CFR requires that all NPDES permits specify requirements for recording and reporting monitoring results. Sections 13267 and 13383 of the CWC authorize the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program (MRP) establishes monitoring and reporting requirements to implement federal and State requirements. This MRP is provided in Attachment E.
9. ***Stormwater Requirements.*** USEPA promulgated Federal Regulations for storm water on 16 November 1990 in 40 CFR Parts 122, 123, and 124. The NPDES Industrial Storm Water Program regulates storm water discharges from inactive mine sites. Inactive mine sites are applicable industries under the stormwater program and are obligated to comply with the Federal Regulations. Storm water discharges from the Empire Mine State Historic Park are regulated under the General Permit for Discharges of Storm Water Associated with Industrial Activities (State Water Resources Control Board, Water Quality Order No. 97-03-DWQ, NPDES General Permit No. CAS000001). The Discharger's waste discharge identification (WDID) number for the storm water permit is 5S29I019611.
10. ***Title 27, California Code of Regulations.*** Title 27, California Code of Regulations (CCR), (hereafter Title 27) is applicable to the discharge authorized herein and the treatment and storage facilities associated with the discharge of mine drainage. The Discharger is responsible for complying with these regulations.

D. Impaired Water Bodies on CWA 303(d) List

1. The Basin Plan includes a list of Water Quality Limited Segments (WQLSs), which are defined as "...those sections of lakes, streams, rivers or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate limitations for point sources (40 CFR 130, et seq.)." The Basin Plan also states, "Additional treatment beyond minimum federal standards will be imposed on dischargers to WQLSs. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment." The upper Bear River is listed as a WQLS for mercury and Wolf Creek is listed as a WQLS for fecal coliform organisms in the 303(d) list of impaired water bodies.
 - a. ***Fecal Coliform Organisms***—Wolf Creek is listed as a WQLS for fecal coliform organisms in the 303(d) list of impaired water bodies. The beneficial use of contact recreation has been impaired due to concentrations of fecal coliform organisms. The discharge of mine drainage is not expected to contain appreciable concentrations of fecal coliform organisms. Preparation of a TMDL for fecal coliform organisms in Wolf Creek has not yet been scheduled.

- b. *Mercury*—The upper Bear River is listed as an impaired water body pursuant to Section 303(d) of the Clean Water Act because of mercury. Mercury bioaccumulates in fish tissue and, therefore, discharge of mercury to the receiving water is likely to contribute to exceedances of the narrative toxicity objective and impacts on beneficial uses. The beneficial use of fish consumption has been impaired due to bioaccumulation of mercury in fish tissue. As discussed below at IV.C.p (page F-28), effluent limitations for total recoverable mercury are included and are based on the California Toxics Rule criterion. Regional Water Board staff are currently preparing a TMDL for methylmercury. If the mercury TMDL is adopted and approved prior to expiration of this Order, this Order may be reopened and the waste load allocation(s) incorporated as effluent limitations.

E. Other Plans, Policies, and Regulations—*Not Applicable*

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

Effluent limitations and toxic and pretreatment effluent standards established pursuant to Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act (CWA) and amendments thereto are applicable to the discharge.

The Federal CWA mandates the implementation of effluent limitations that are as stringent as necessary to meet water quality standards established pursuant to state or federal law [33 U.S.C., § 1311(b)(1)(C); 40 CFR, § 122.44(d)(1)]. NPDES permits must incorporate discharge limits necessary to ensure that water quality standards are met. This requirement applies to narrative criteria as well as to criteria specifying maximum amounts of particular pollutants. Pursuant to Federal Regulations, 40 CFR Section 122.44(d)(1)(i), NPDES permits must contain limits that control all pollutants that “*are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality.*” Federal Regulations, 40 CFR, §122.44(d)(1)(vi), further provide that “[w]here a state has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority must establish effluent limits.”

The CWA requires point source discharges to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations: 40 CFR §122.44(a) requires that permits include applicable technology-based limitations and standards, and 40 CFR §122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water where numeric water quality objectives have not been established. The Regional Water Board’s Basin Plan, page IV-17.00, contains an implementation policy (“Policy for Application of Water Quality Objectives”) that specifies that the Regional Water Board “*will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives.*” This Policy complies with 40 CFR §122.44(d)(1). With respect to narrative objectives, the Regional Water Board must establish effluent limitations using one or more of three specified sources,

including (1) EPA’s published water quality criteria, (2) a proposed state criterion (*i.e.*, water quality objective) or an explicit state policy interpreting its narrative water quality criteria (*i.e.*, the Regional Water Board’s “Policy for Application of Water Quality Objectives”) (40 CFR 122.44(d)(1) (vi) (A), (B) or (C)), or (3) an indicator parameter. The Basin Plan contains a narrative objective requiring that: “*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life*” (narrative toxicity objective). The Basin Plan requires the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, discoloration, toxic substances, radionuclides, or taste and odor producing substances that adversely affect beneficial uses. The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. The Basin Plan also limits chemical constituents in concentrations that adversely affect surface water beneficial uses. For waters designated as municipal, the Basin Plan specifies that, at a minimum, waters shall not contain concentrations of constituents that exceed Maximum Contaminant Levels (MCL) of CCR Title 22. The Basin Plan further states that, to protect all beneficial uses, the Regional Water Board may apply limits more stringent than MCLs. When a reasonable potential exists for exceeding a narrative objective, Federal Regulations mandate numerical effluent limitations and the Basin Plan narrative criteria clearly establish a procedure for translating the narrative objectives into numerical effluent limitations.

A. Discharge Prohibitions

1. Discharge of wastewater at a location or in a manner different from that described in the Findings is prohibited.
2. The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Federal Standard Provision I.A.7. [See Attachment D – Federal Standard Provisions] and Regional Water Board Standard Provision VI.A.2.f.
3. Neither the discharge nor its treatment shall create a nuisance as defined in Section 13050 of the California Water Code.

B. Technology-Based Effluent Limitations

1. Scope and Authority

The CWA requires that technology-based effluent limitations be established based on several levels of controls:

- Best practicable treatment control technology (BPTC) represents the average of the best performance by plants within an industrial category or subcategory. BPTC standards apply to toxic, conventional, and nonconventional pollutants.
- Best available technology economically achievable (BAT) represents the best existing performance of treatment technologies that are economically achievable within an

industrial point source category. BAT standards apply to toxic and nonconventional pollutants.

- Best conventional pollutant control technology (BCT) represents the control from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, and oil and grease. The BCT standard is established after considering the “cost reasonableness” of the relationship between the cost of attaining a reduction in effluent discharge and the benefits that would result, and also the cost effectiveness of additional industrial treatment beyond BPTC.
- New source performance standards (NSPS) represent the best available demonstrated control technology standards. The intent of NSPS guidelines is to set limitations that represent state-of-the-art treatment technology for new sources.

The CWA requires USEPA to develop effluent limitations, guidelines and standards (ELGs) representing application of BPTC, BAT, BCT, and NSPS. Section 402(a)(1) of the CWA and 40 CFR §125.3 of the NPDES regulations authorize the use of best professional judgment (BPJ) to derive technology-based effluent limitations on a case-by-case basis where ELGs are not available for certain industrial categories and/or pollutants of concern.

2. **Applicable Technology-Based Effluent Limitations**

- a. The Code of Federal Regulations (CFR) at 40 CFR §122.44(a) requires that permits include applicable technology-based limitations and standards. This Order includes technology-based effluent limitations based on consideration of Effluent Limitations Guidelines and Standards for the Ore Mining and Dressing Point Source Category in 40 CFR Part 440, Subpart J—Copper, Lead, Zinc, Gold, Silver, and Molybdenum Ores Subcategory and Best Professional Judgment (BPJ) in accordance with 40 CFR §125.3.
- b. Effluent Limitations Guidelines and Standards for the Ore Mining and Dressing Point Source Category in 40 CFR Part 440, Subpart J—Copper, Lead, Zinc, Gold, Silver, and Molybdenum Ores Subcategory are applicable to discharges from the following:
 - (1) *Mines that produce copper, lead, zinc, gold, silver, or molybdenum bearing ores, or any combination of these ores from open-pit or underground operations other than placer deposits;*
 - (2) *Mills that use the froth-flotation process alone or in conjunction with other processes, for the beneficiation of copper, lead, zinc, gold, silver, or molybdenum ores, or any combination of these ores;*
 - (3) *Mines and mills that use dump, heap, in-situ leach, or vat-leach processes to extract copper from ores or ore waste materials; and*
 - (4) *Mills that use the cyanidation process to extract gold or silver.*

- c. “Mine” is defined in 40 CFR 440.132(g) as “*an active mining area, including all land and property placed under, or used above the surface of such land, used in or resulting from the work of extracting metal ore or minerals from their natural deposits by any means or method, including secondary recovery of metal ore from refuse or other storage piles, wastes, or rock dumps and mill tailings derived from the mining, cleaning, or concentration of metal ores.*”
- d. “Mine drainage” is defined in 40 CFR 440.132(h) as “*any water drained, pumped, or siphoned from a mine*”.
- e. The Empire Mine State Historic Park consists of land and property used in or resulting from the work of extracting metal ore or minerals, specifically gold, from their natural deposits by any means or method. The discharge from the Magenta Drain is water drained from the Empire Mine. Therefore, the discharge is mine drainage and Effluent Limitations Guidelines and Standards for the Ore Mining and Dressing Point Source Category in 40 CFR Part 440, Subpart J—Copper, Lead, Zinc, Gold, Silver, and Molybdenum Ores Subcategory apply. In addition, it is reasonable that effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT) and the application of the best practicable control technology (BPT) for an active mine are also representative of the degree of effluent reduction attainable by the application of BAT and BPT for a mine that is not in production.
- f. **40 CFR 440.102 Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology (BPT)** states that “[e]xcept as provided in subpart L of this part and 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT): (a) The concentration of pollutants discharged in mine drainage from mines operated to obtain copper bearing ores, lead bearing ores, zinc bearing ores, gold bearing ores, or silver bearing ores, or any combination of these ores [from] open-pit or underground operations other than placer deposits shall not exceed:

Effluent characteristic	Effluent Limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	Milligrams per liter	
TSS.....	30	20
Cu.....	.30	.15
Zn.....	1.5	.75
Pb.....	.6	.3
Hg.....	.002	.001
pH.....	(1)	(1)

¹Within the range of 6.0 to 9.0. ”

- g. **40 CFR 440.103 Effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT)** states that “[e]xcept as provided in subpart L of this part and 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT): (a) The concentration of pollutants discharged in mine drainage from mines that produce copper, lead, zinc, gold, silver, or molybdenum bearing ores, or any combination of these ores from open-pit or underground operations other than placer deposits shall not exceed:

Effluent characteristic	Effluent Limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days
	<i>Milligrams per liter</i>	
<i>Cu</i>	<i>0.30</i>	<i>0.15</i>
<i>Zn</i>	<i>1.5</i>	<i>0.75</i>
<i>Pb</i>	<i>0.6</i>	<i>0.3</i>
<i>Hg</i>	<i>0.002</i>	<i>0.001</i>
<i>Cd</i>	<i>0.10</i>	<i>0.05</i>

- h. It is reasonable that effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT) and the application of the best practicable control technology (BPT) for an active mine are also representative of the degree of effluent reduction attainable by the application of BAT and BPT for an inactive mine.

**Summary of Technology-based Effluent Limitations
 Discharge Point EFF-001**

Technology based limitations are utilized to assure the treatment systems are properly designed and operated.

Parameter	Units	Effluent Limitations			
		Average Monthly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Total Suspended Solids	mg/L	20	30	--	--
pH	standard units	--	--	6.0	9.0
Cadmium, Total Recoverable	µg/L	50	100	--	--
Copper, Total Recoverable	µg/L	150	300	--	--
Lead, Total Recoverable	µg/L	300	600	--	--
Mercury, Total Recoverable	µg/L	1	2	--	--
Zinc, Total Recoverable	µg/L	750	1,500	--	--

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

As specified in 40 CFR §122.44(d)(1)(i), permits are required to include WQBELs for pollutants (including toxicity) that are or may be discharged at levels that cause, have reasonable potential to cause, or contribute to an excursion above any state water quality standard. The process for determining reasonable potential and calculating WQBELs when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plan, and achieve applicable water quality objectives and criteria that are contained in other state plans and policies, or water quality criteria contained in the CTR and NTR.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

- a. **Receiving Water**—The Magenta Drain discharge flows off of the Empire Mine State Historic Park, into an unnamed tributary to the South Fork of Wolf Creek, and through the City of Grass Valley’s Veterans Memorial Park before entering the South Fork of Wolf Creek, which is tributary to Wolf Creek, thence the Bear River. The beneficial uses of the unnamed tributary to the South Fork of Wolf Creek, as described above in III.C.1, are as follows:

Discharge Point	Receiving Water Name	Beneficial Use(s)
EFF-001	Unnamed Tributary to the South Fork of Wolf Creek	<p><u>Existing:</u> Municipal and domestic supply (MUN); agricultural supply, including stock watering (AGR); hydropower generation (POW); water contact recreation, including canoeing and rafting (REC-1); non-contact water recreation, including aesthetic enjoyment (REC-2); warm freshwater habitat (WARM); cold freshwater habitat (COLD); and wildlife habitat (WILD).</p> <p><u>Potential:</u> Warm migration of aquatic organisms (MGR); cold migration of aquatic organisms (MGR); warm spawning, reproduction, and/or early development (SPWN); and cold spawning, reproduction, and /or early development (SPWN);</p> <p><u>Groundwater:</u> Municipal and domestic water supply (MUN), industrial service supply (IND), industrial process supply (PRO), and agricultural supply (AGR).</p>

- b. **Hardness**—While no Effluent Limitation for hardness is necessary in this Order, hardness is critical to the assessment of the need for, and the development of, Effluent Limitations for certain metals. The *California Toxics Rule*, at (c)(4), states the following:

“Application of metals criteria. (i) *For purposes of calculating freshwater aquatic life criteria for metals from the equations in paragraph (b)(2) of this section, for waters with a hardness of 400 mg/L or less as calcium carbonate, the actual ambient hardness of the surface water shall be used in those equations.*” [emphasis added]

The State Water Resources Control Board, in footnote 19 to Water Quality Order No. 2004-0013, stated: “We note that...the Regional Water Board...applied a variable hardness value whereby effluent limitations will vary depending on the actual, current hardness values in the receiving water. We recommend that the Regional Water Board establish either fixed or seasonal effluent limitations for metals, as provided in the SIP, rather than ‘floating’ effluent limitations.”

Effluent Limitations for the discharge must be set to protect the beneficial uses of the receiving water for all discharge conditions. In the absence of the option of including condition-dependent, “floating” effluent limitations that are reflective of actual conditions at the time of discharge, Effluent Limitations must be set using the worst-case condition (e.g., lowest ambient hardness) in order to protect beneficial uses for all discharge conditions.

Minimal data are available for ambient hardness. The data set was, therefore, augmented with hardness data collected by the City of Grass Valley from Wolf Creek. The lowest measured hardness in Wolf Creek upstream of the City’s WWTP was used in determining reasonable potential and Effluent Limitations for metals with hardness-dependent criteria. This Order requires characterization of the receiving stream hardness and the discharge. If the results of the characterization indicate a different ambient hardness, this Order may be reopened and modified. The augmented hardness data set is shown below.

Table F-1 — Empire Mine SHP , Order No. R5-2006-0058: Results for Hardness (mg/L as CaCO₃)

Sample Location	Empire Mine	South Fork Wolf Creek, RWS-002	Grass Valley WWTP R-1	Grass Valley WWTP R-2
9 February 2002	--	--	84	--
16 February 2002	--	--	15	--
19 March 2002	--	--	66	--
21 May 2002	--	--	40	--
18 June 2002	--	--	24	--
16 July 2002	--	--	15	--
14 August 2002	--	--	19	--
20 August 2002	--	--	17	--
17 September 2002	--	--	30	--
15 October 2002	--	--	20	--
4 November 2002	--	--	85	--
19 November 2002	--	--	112	--
21 January 2003	--	--	120	--
23 January 2003	--	--	120	--
10 February 2003	--	--	75	--
21 February 2003	--	--	78	--
12 May 2003	--	--	49	--
20 August 2003	--	--	13 ¹	18
17 September 2003	--	--	23 ¹	32

¹ Calculated from Grass Valley WWTP R-2 hardness, R-1 flow, and effluent hardness and flow

Table F-1 — Empire Mine SHP , Order No. R5-2006-0058: Results for Hardness (mg/L as CaCO₃)

Sample Location	Empire Mine	South Fork Wolf Creek, RWS-002	Grass Valley WWTP R-1	Grass Valley WWTP R-2
15 October 2003	--	--	25 ¹	31
12 November 2003	--	--	80 ¹	87
10 December 2003	--	--	81 ¹	87
7 January 2004	--	--	53 ¹	57
28 May 2004	--	--	3 ¹	13
26 August 2004	--	--	17 ¹	26
4 November 2004	--	--	65 ¹	90
2 December 2004	--	--	91 ¹	119
6 January 2005	--	--	75 ¹	94
2 February 2005	--	--	80 ¹	96
2 March 2005	--	--	65 ¹	68
6 April 2005	--	--	61 ¹	72
5 May 2005	--	--	38 ¹	45
2 June 2005	--	--	43 ¹	50
7 July 2005	--	--	24 ¹	34
4 August 2005	--	--	25 ¹	33
1 September 2005	--	--	18 ¹	25
6 October 2005	--	--	20 ¹	29
3 November 2005	--	--	111 ¹	125
1 December 2005	--	--	29 ¹	31
5 January 2006	--	--	32 ¹	41
19 January 2006	240	50	--	--
Minimum	240	50	3.1 ² /15	13
Average	--	--	51 ² /58	57

² Including calculated values.

- c. **Assimilative Capacity/Mixing Zone**—Based on the available information, the worst-case dilution is assumed to be zero to provide protection for the receiving water beneficial uses. The impact of assuming zero assimilative capacity within the receiving water is that discharge limitations are end-of-pipe limits with no allowance for dilution within the receiving water.

3. Determining the Need for WQBELs

- a. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs the Regional Water Board finds that the discharge does have a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for aluminum, antimony, arsenic, barium, cadmium, chromium (III), cobalt, color, copper, dissolved oxygen, iron, lead, manganese, mercury, nickel, pH, settleable solids, thallium, total dissolved solids, turbidity,

vanadium, zinc. Effluent limitations for these constituents are included in this Order.

- b. Reasonable potential (RP) was determined by comparing the observed maximum effluent concentration (MEC) to applicable water quality criteria; if a criterion was exceeded, the discharge was determined to have reasonable potential to exceed a water quality objective for that constituent.
- c. **Aluminum**—Aluminum in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a level necessary to protect aquatic life, and, therefore to violate the Basin Plan’s narrative toxicity objective. USEPA developed National Recommended Ambient Water Quality Criteria for protection of freshwater aquatic life for aluminum. The recommended four-day average (chronic) and one-hour average (acute) criteria for aluminum are 87 µg/L and 750 µg/L, respectively, for waters with a pH of 6.5 to 9.0. USEPA recommends that the ambient criteria are protective of the aquatic beneficial uses of receiving waters in lieu of site-specific criteria. The receiving stream has been measured to have a variable, but generally low hardness—typically between 10 and 120 mg/L as CaCO₃. This condition is supportive of the applicability of the ambient water quality criteria for aluminum, according to USEPA’s development document. Applying 40 CFR §122.44(d)(1)(vi)(B), Effluent Limitations for aluminum are included in this Order and are based on USEPA’s Ambient Water Quality Criteria for the protection of the beneficial use of freshwater aquatic habitat.

Aluminum was detected in an effluent sample collected 9 June 2003 at a concentration of 36,100 µg/L. The recommended continuous concentration (maximum four-day average concentration or CCC) is 87 µg/L and the recommended maximum concentration (maximum one-hour average concentration or CMC) is 750 µg/L. The observed MEC is greater than the water quality criteria; therefore, effluent limitations for aluminum are required.

The USEPA *Technical Support Document for Water Quality-Based Toxics Control* [EPA/505/2-90-001] contains statistical methods for converting chronic (four-day) and acute (one-hour) aquatic life criteria to average monthly and maximum daily effluent limitations based on the variability of the existing data and the expected frequency of monitoring. Equations summarizing the conversion are shown below:

$$AMEL = 1.55[\min(0.321CMC, 0.527CCC)] = 71 \mu\text{g/L}$$
$$MDEL = 3.11[\min(0.321CMC, 0.527CCC)] = 140 \mu\text{g/L}$$

In USEPA’s *Ambient Water Quality Criteria for Aluminum—1988* [EPA 440/5-86-008], USEPA states that “[a]cid-soluble aluminum...is probably the best measurement at the present...”; however, USEPA has not yet approved an acid-soluble test method for aluminum. Replacing the inductively coupled plasma /atomic emission spectrometric (ICP/AES) portion of the analytical procedure with ICP/mass spectrometry (ICP/MS) would allow lower detection limits to be achieved. Based on USEPA’s discussion of aluminum analytical methods, this Order allows the use of the alternate aluminum testing protocol described above to meet monitoring requirements.

This Order includes average monthly and maximum daily effluent limitations for aluminum.

- d. **Antimony**—The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Primary Maximum Contaminant Level (MCL) for antimony of 6 µg/L.

The observed antimony MEC was detected in an effluent sample collected 9 June 2003 at a concentration of 98.9 µg/L. The observed MEC is greater than the water quality criteria; therefore, an Effluent Limitation for antimony is required. An Effluent Limitation for antimony is included in this Order and is based on the Basin Plan water quality objectives for chemical constituents and the DHS Primary MCL.

This Order includes an average monthly Effluent Limitation for antimony that is equal to the Primary MCL.

- e. **Arsenic**—The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the USEPA Primary Maximum Contaminant Level (MCL) of 10 µg/L for arsenic. Pursuant to the Safe Drinking Water Act, the California DHS must revise the California arsenic MCL in Title 22 CCR to be as low as, or lower than, the USEPA MCL. Applying the Basin Plan’s “Policy for Application of Water Quality Objectives”, to protect future municipal and domestic water use, it is reasonable to apply the USEPA MCL for arsenic to the receiving stream. The observed arsenic MEC was detected in an effluent sample collected 9 June 2003 at a concentration of 35,400 µg/L. The observed MEC is greater than the water quality criteria; therefore, an Effluent Limitation for arsenic is required. An Effluent Limitation for arsenic is included in this Order and is based on the Basin Plan water quality objectives for chemical constituents, the USEPA Primary MCL, and protection of the beneficial use of municipal and domestic supply.

This Order includes an average monthly Effluent Limitation for arsenic that is equal to the Primary MCL.

- f. **Barium**—The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Primary Maximum Contaminant Level (MCL) for barium of 1,000 µg/L.

The observed barium MEC was detected in an effluent sample collected 9 June 2003 at a concentration of 2,480 µg/L. The observed MEC is greater than the water quality criteria; therefore, an Effluent Limitation for barium is required. An Effluent Limitation for barium is included in this Order and is based on the Basin Plan water quality objectives for chemical constituents and the DHS Primary MCL.

This Order includes an average monthly Effluent Limitation for barium that is equal to the Primary MCL.

- g. **Cadmium**—The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for cadmium. The CTR includes hardness-dependent criteria for the protection of freshwater aquatic life for cadmium. The criteria for cadmium are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for cadmium in freshwater are $1.101672 - [0.041838 \times \ln(\text{hardness})]$ for the chronic criteria and $1.136672 - 0.041838 \times \ln(\text{hardness})$ for the acute criteria.

The observed cadmium MEC was detected in a sample collected 9 June 2003 at a concentration of 494 µg/L. Using the worst-case ambient (lowest receiving water) measured hardness of (15 mg/L), the applicable chronic criterion (maximum four-day average concentration) is 0.56 µg/L and the applicable acute criterion (maximum one-hour average concentration) is 0.53 µg/L. The observed MEC is greater than the water quality criteria; therefore, Effluent Limitations for cadmium are required. The Effluent Limitations for cadmium included in this Order are presented in total concentrations, and are based on CTR standards for the protection of freshwater aquatic life.

The SIP requires converting CTR chronic (four-day) and acute (one-hour) aquatic life criteria to average monthly and maximum daily effluent limitations based on the variability of the existing data and the expected frequency of monitoring. Equations summarizing the conversion are shown below:

$$CCC = e^{[0.8545 \ln(\text{hardness}) - 1.702]} = 0.56 \text{ } \mu\text{g/L}$$

$$CMC = e^{[0.9422 \ln(\text{hardness}) - 1.700]} = 0.53 \text{ } \mu\text{g/L}$$

$$AMEL = 1.55 [\min(0.321CMC, 0.527CCC)] = 0.26 \text{ } \mu\text{g/L}$$

$$MDEL = 3.11 [\min(0.321CMC, 0.527CCC)] = 0.53 \text{ } \mu\text{g/L}$$

This Order includes average monthly and maximum daily effluent cadmium limitations.

- h. **Chromium, Total and Trivalent (III)**—The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for chromium III. The CTR includes hardness-dependent criteria for the protection of freshwater aquatic life for chromium III. The criteria for chromium (III) are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for chromium III in freshwater are 0.316 and 0.860 for the acute and the chronic criteria, respectively. The Discharger did not provide any information regarding the levels of chromium III in the discharge. The Discharger did, however, provide data for total chromium in the effluent. No data were provided for chromium VI in the effluent. Chromium can exist in eight valence states, ranging from –2 to +6. Chromium III is the most stable valence state, followed by chromium VI. Total chromium in the effluent is likely to be in the chromium III state.

The observed chromium III MEC was detected in a sample collected 9 June 2003 at a concentration of 53.4 µg/L. Using the worst-case ambient (lowest receiving water) measured hardness of (15 mg/L), the applicable chronic criterion (maximum four-day

average concentration) is 44 µg/L and the applicable acute criterion (maximum one-hour average concentration) is 367 µg/L. The observed MEC is greater than the water quality criteria; therefore, Effluent Limitations for chromium III are required. The Effluent Limitations for chromium III included in this Order are presented in total concentrations, and are based on CTR standards for the protection of freshwater aquatic life.

The SIP requires converting CTR chronic (four-day) and acute (one-hour) aquatic life criteria to average monthly and maximum daily effluent limitations based on the variability of the existing data and the expected frequency of monitoring. Equations summarizing the conversion are shown below:

$$CCC = e^{[0.8545 \ln(\text{hardness}) - 1.702]} = 44 \text{ } \mu\text{g/L}$$

$$CMC = e^{[0.9422 \ln(\text{hardness}) - 1.700]} = 367 \text{ } \mu\text{g/L}$$

$$AMEL = 1.55[\min(0.321CMC, 0.527CCC)] = 36 \text{ } \mu\text{g/L}$$

$$MDEL = 3.11[\min(0.321CMC, 0.527CCC)] = 72 \text{ } \mu\text{g/L}$$

This Order includes average monthly and maximum daily effluent chromium III limitations. The Effluent Limitations for chromium III included in this Order are presented in total concentrations, and are based on CTR standards for the protection of freshwater aquatic life.

- i. **Cobalt**—Cobalt in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a level necessary to protect the beneficial use of agricultural irrigation, and, therefore to violate the Basin Plan’s narrative toxicity and chemical constituents objectives. *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985), recommends that the cobalt concentration in waters used for agricultural irrigation not exceed 50 µg/L. Applying the Basin Plan “Policy for Application of Water Quality Objectives”, the numeric standard that implements the narrative objective is the Agricultural Water Quality Goal of 50 µg/L.

The observed cobalt MEC was detected in an effluent sample collected 9 June 2003 at a concentration of 257 µg/L. The recommended maximum concentration for protection of agricultural uses is 50 µg/L. The observed MEC is greater than the water quality standard; therefore, an Effluent Limitation for cobalt is required. The Effluent Limitation for cobalt included in this Order is presented in total recoverable concentration, and is based on protection of the beneficial use of agricultural irrigation.

This Order includes an average monthly Effluent Limitation for cobalt that is equal to the agricultural goal.

- j. **Color**—The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Secondary Maximum Contaminant Level (MCL)-Consumer Acceptance Limit for color of 15 units.

The discharge of mine drainage from the Empire Mine State Historic Park's Magenta Drain to surface water was discovered by Regional Water Board and City of Grass Valley staff following an investigation into a complaint by downstream residents that Wolf Creek was discolored. The mine drainage discharge contains arsenic and iron in elevated concentrations that may contribute to discoloration of surface waters.

Wastewater is discharged to the headwaters of the unnamed tributary to the South Fork of Wolf Creek, which is tributary to the South Fork of Wolf Creek, Wolf Creek, and the Bear River. Stormwater runoff and other surface drainage enters the unnamed tributary to the South Fork of Wolf Creek prior to its confluence with the South Fork of Wolf Creek. This Order contains Receiving Water Limitations based on Basin Plan Water Quality Objectives. Receiving water sampling can not be conducted upstream of the point of discharge since the discharge constitutes the unnamed tributary's headwaters. Comparison of the results of receiving water sampling upstream and downstream of the confluence of the unnamed tributary with the South Fork of Wolf Creek might not accurately reflect the impacts of the discharge. In order to assure compliance with Receiving Water Limitations, an Effluent Limitation has been established at the point of discharge for color.

An Effluent Limitation for color is included in this Order and is based on the Basin Plan water quality objectives for chemical constituents and color and the DHS Secondary MCL.

This Order includes an average monthly Effluent Limitation for color that is equal to the secondary maximum contaminant level.

- k. **Copper**—The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for copper. The CTR includes hardness-dependent criteria for the protection of freshwater aquatic life for copper. The criteria for copper are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for copper in freshwater are 0.960 for both the acute and the chronic criteria.

The observed copper MEC was detected in a sample collected 9 June 2003 at a concentration of 41.5 µg/L. Using the worst-case ambient (lowest receiving water) measured hardness from the effluent and receiving water (15 mg/L), the applicable chronic criterion (maximum four-day average concentration) is 1.8 µg/L and the applicable acute criterion (maximum one-hour average concentration) is 2.3 µg/L. The observed MEC is greater than the water quality criteria; therefore, Effluent Limitations for copper are required. The Discharger has not requested a mixing zone or use of assimilative capacity for effluent limitations based on protection of aquatic life. The Effluent Limitations for copper included in this Order are presented in total

concentrations, and are based on CTR standards for the protection of freshwater aquatic life.

The SIP requires converting CTR chronic (four-day) and acute (one-hour) aquatic life criteria to average monthly and maximum daily effluent limitations based on the variability of the existing data and the expected frequency of monitoring. Equations summarizing the conversion are shown below:

$$CCC = e^{[0.8545 \ln(\text{hardness}) - 1.702]} = 1.8 \text{ } \mu\text{g/L}$$

$$CMC = e^{[0.9422 \ln(\text{hardness}) - 1.700]} = 2.3 \text{ } \mu\text{g/L}$$

$$AMEL = 1.55[\min(0.321CMC, 0.527CCC)] = 1.2 \text{ } \mu\text{g/L}$$

$$MDEL = 3.11[\min(0.321CMC, 0.527CCC)] = 2.3 \text{ } \mu\text{g/L}$$

This Order includes average monthly and maximum daily effluent copper limitations.

1. **Dissolved Oxygen**—Wastewater is discharged to the headwaters of the unnamed tributary to the South Fork of Wolf Creek, which is tributary to the South Fork of Wolf Creek, Wolf Creek, and the Bear River. Stormwater runoff and other surface drainage enters the unnamed tributary to the South Fork of Wolf Creek prior to its confluence with the South Fork of Wolf Creek. This Order contains Receiving Water Limitations based on Basin Plan Water Quality Objectives. Receiving water sampling can not be conducted upstream of the point of discharge since the discharge constitutes the unnamed tributary's headwaters. Comparison of the results of receiving water sampling upstream and downstream of the confluence of the unnamed tributary with the South Fork of Wolf Creek might not accurately reflect the impacts of the discharge. In order to assure compliance with Receiving Water Limitations, Effluent Limitations have been established at the point of discharge for dissolved oxygen.

For water bodies designated as having COLD as a beneficial use, the Basin Plan includes a water quality objective of maintaining a minimum of 7.0 mg/L of dissolved oxygen. Since the beneficial use of COLD does apply to the Bear River, a receiving water limitation of 7.0 mg/L for dissolved oxygen was included in this Order.

For surface water bodies outside of the Delta, the Basin Plan includes the water quality objective that “...*the monthly median of the mean daily dissolved oxygen (DO) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation.*” This objective is included as an Effluent Limitation in this Order.

- m. **Iron**—The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Secondary Maximum Contaminant Level (MCL)-Consumer Acceptance Limit for iron of 300 $\mu\text{g/L}$.

The observed iron MEC was detected in an effluent sample collected 9 June 2003 at a concentration of 4,760,000 $\mu\text{g/L}$. The observed MEC is greater than the water quality

criteria; therefore, an Effluent Limitation for iron is required. An Effluent Limitation for iron is included in this Order and is based on the Basin Plan water quality objectives for chemical constituents and color and the DHS Secondary MCL.

This Order includes an average monthly Effluent Limitation for iron that is equal to the secondary maximum contaminant level.

- n. **Lead**—The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR standards for lead. The CTR includes hardness-dependent standards for the protection of freshwater aquatic life for lead. The standards for metals are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for lead in freshwater are $1.46203 - [0.145712 \times \ln(\text{hardness})]$ for both the acute and the chronic criteria. The observed lead MEC was detected in an effluent sample collected 9 June 2003 at a concentration of 146 $\mu\text{g/L}$. Using the worst-case ambient (lowest receiving water) measured hardness of (15 mg/L), the applicable chronic criterion (maximum four-day average concentration) is 0.28 $\mu\text{g/L}$ and the applicable acute criterion (maximum one-hour average concentration) is 7.3 $\mu\text{g/L}$. The observed MEC is greater than the water quality criteria and Effluent Limitations for lead are required. The Effluent Limitations for lead included in this Order are presented in total concentrations, and are based on the CTR standards for the protection of freshwater aquatic life.

The SIP requires converting CTR chronic (four-day) and acute (one-hour) aquatic life criteria to average monthly and maximum daily effluent limitations based on the variability of the existing data and the expected frequency of monitoring. Equations summarizing the conversion are shown below:

$$CCC = e^{[1.273 \ln(\text{hardness}) - 4.705]} = 0.28 \mu\text{g/L}$$

$$CMC = e^{[1.273 \ln(\text{hardness}) - 1.460]} = 7.3 \mu\text{g/L}$$

$$AMEL = 1.55 [\min(0.321CMC, 0.527CCC)] = 0.23 \mu\text{g/L}$$

$$MDEL = 3.11 [\min(0.321CMC, 0.527CCC)] = 0.47 \mu\text{g/L}$$

This Order includes average monthly and maximum daily effluent lead limitations.

- o. **Manganese**—The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Secondary Maximum Contaminant Level (MCL)-Consumer Acceptance Limit of 50 $\mu\text{g/L}$ for manganese.

The observed manganese MEC was detected in an effluent sample collected 9 June 2003 at a concentration of 172,000 $\mu\text{g/L}$. The observed MEC is greater than the water quality criteria; therefore, an Effluent Limitation for manganese is required. An Effluent Limitation for manganese is included in this Order and is based on the Basin Plan water quality objectives for chemical constituents, color, and tastes and odors and the DHS Secondary MCL.

This Order includes an average monthly Effluent Limitation for manganese that is equal to the Secondary MCL.

- p. **Mercury**—The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for total recoverable mercury. The CTR includes a total recoverable mercury criterion of 0.050 µg/L for the protection of human health, based on a one-in-a-million cancer risk for waters from which both water and aquatic organisms are consumed. Total recoverable mercury was detected in an effluent sample collected 9 June 2003 at a concentration of 1.2 µg/L. The observed MEC is greater than the water quality criteria; therefore, Effluent Limitations for total recoverable mercury are required. Effluent Limitations for total recoverable mercury are included in this Order and are based on the NTR criterion for the protection of human health.

The AMEL was set equal to the standard of 0.50 µg/L and the MDEL was calculated as follows:

$$MDEL = \left(\frac{3.11}{1.55} \right) AMEL = 0.10 \mu g / L$$

Where: AMEL = average monthly effluent limitation
MDEL = maximum daily effluent limitation

This Order includes average monthly and maximum daily effluent limitations for total recoverable mercury.

- q. **Nickel**—The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR standards for nickel. The CTR includes hardness-dependent standards for the protection of both freshwater and saltwater aquatic life for nickel. The standards for metals are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for nickel in freshwater are 0.998 for the acute criteria and 0.997 for the chronic criteria.

The observed nickel MEC was detected in an effluent sample collected 9 June 2003 at a concentration of 15.6 µg/L. Using the worst-case ambient (lowest receiving water) measured hardness of (15 mg/L), the applicable continuous concentration (maximum four-day average concentration) is 10 µg/L and the applicable maximum concentration (maximum one-hour average concentration) is 94 µg/L. The observed MEC is greater than the water quality criteria; therefore, Effluent Limitations for nickel are required. The Effluent Limitations for nickel included in this Order are presented in total concentrations, and are based on the CTR standards for the protection of freshwater aquatic life.

The SIP requires converting CTR chronic (four-day) and acute (one-hour) aquatic life criteria to average monthly and maximum daily effluent limitations based on the variability of the existing data and the expected frequency of monitoring. Equations

summarizing the conversion are shown below:

$$CCC = e^{[0.8460 \ln(\text{hardness}) + 0.0584]}$$

$$CMC = e^{[0.8460 \ln(\text{hardness}) + 2.255]}$$

$$AMEL = 1.55[\min(0.321CMC, 0.527CCC)] = 9.0 \mu\text{g/L}$$

$$MDEL = 3.11[\min(0.321CMC, 0.527CCC)] = 17 \mu\text{g/L}$$

This Order includes average monthly and maximum daily effluent nickel limitations.

- r. **pH**—The Basin Plan includes a water quality objective for surface waters (except for Goose Lake) that the “...pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses.” Effluent Limitations for pH are included in this Order and are based on the Basin Plan objectives for pH.
- s. **Settleable Solids**—For inland surface waters, the Basin Plan states that “[w]ater shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.” Discolored sediments are visible in the streambed from the Magenta Drain Tunnel portal, through the length of the City of Grass Valley’s Veterans Memorial Park to a point where the stream has been diverted underground. This Order contains average monthly and average daily effluent limitations for settleable solids.

Because the amount of settleable solids is measured in terms of volume per volume without a mass component, it is impracticable to calculate mass limitations for inclusion in this Order.

- t. **Thallium**—The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the NTR criteria for thallium. The NTR includes a thallium criterion of 1.7 $\mu\text{g/L}$ for the protection of human health, based on a one-in-a-million cancer risk for waters from which both water and aquatic organisms are consumed. Thallium was detected in an effluent sample collected 9 June 2003 at a concentration of 361 $\mu\text{g/L}$. The observed MEC is greater than the water quality criteria; therefore, Effluent Limitations for thallium are required. Effluent Limitations for thallium are included in this Order and are based on the NTR criterion for the protection of human health.

The AMEL was set equal to the standard of 1.7 $\mu\text{g/L}$ and the MDEL was calculated as follows:

$$MDEL = \left(\frac{11.1}{3.39} \right) AMEL = 5.6 \mu\text{g} / L$$

Where: AMEL = average monthly effluent limitation
MDEL = maximum daily effluent limitation

This Order includes average monthly and maximum daily effluent limitations for thallium.

- u. **Toxicity**—The Basin Plan states that “[a]ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.” The Basin Plan requires that “[a]s a minimum, compliance with this objective...shall be evaluated with a 96-hour bioassay.” This Order requires both acute and chronic toxicity monitoring to evaluate compliance with this water quality objective.

The Basin Plan further states that “...effluent limits based upon acute biotoxicity tests of effluents will be prescribed...”. Effluent limitations for acute toxicity are included in this Order.

- v. **Total Dissolved Solids**—*Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985), recommends that the TDS concentration in waters used for agricultural irrigation not exceed 450 mg/L. Applying the Basin Plan “Policy for Application of Water Quality Objectives”, the numeric standard that implements the chemical constituents objective with respect to protection of the beneficial use of agricultural irrigation supply is the Agricultural Water Quality Goal of 450 mg/L. Total dissolved solids (TDS) in the untreated mine drainage discharge has exceeded the agricultural goal. The discharge has not exceeded the Secondary Maximum Contaminant Level (MCL)-Consumer Acceptance Limit for TDS of 500 mg/L.

The observed TDS MEC was detected in an effluent sample collected 25 March 2004 at a concentration of 483 mg/L. The observed TDS MEC is greater than the water quality standard.

Various possible treatment techniques for the discharge have the potential to either increase or decrease the salinity of the effluent. If TDS in the discharge following implementation of any potential treatment techniques continues to exceed the Agricultural Water Quality Goal, this Order may be reopened and Effluent Limitations for TDS added.

- w. **Turbidity**—The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Secondary Maximum Contaminant Level (MCL)-Consumer Acceptance Limit for turbidity of 5 nephelometric turbidity units (NTU).

The discharge of mine drainage from the Empire Mine State Historic Park’s Magenta Drain to surface water was discovered by Regional Water Board and City of Grass Valley staff following an investigation into a complaint by downstream residents that Wolf Creek was discolored. The mine drainage contains arsenic and iron in elevated concentrations that may contribute to discoloration and turbidity of surface waters.

Wastewater is discharged to the headwaters of the unnamed tributary to the South Fork of Wolf Creek, which is tributary to the South Fork of Wolf Creek, Wolf Creek, and the Bear River. Stormwater runoff and other surface drainage enters the unnamed tributary to the South Fork of Wolf Creek prior to its confluence with the South Fork of Wolf Creek. This Order contains Receiving Water Limitations based on Basin Plan Water Quality Objectives. Receiving water sampling can not be conducted upstream of the point of discharge since the discharge constitutes the unnamed tributary's headwaters. Comparison of the results of receiving water sampling upstream and downstream of the confluence of the unnamed tributary with the South Fork of Wolf Creek might not accurately reflect the impacts of the discharge. Because the discharge is at the headwaters of the unnamed tributary to the South Fork of Wolf Creek, there is no point immediately upstream from the discharge to use as a reference in determining compliance with the Basin Plan objectives for turbidity change.

In order to assure compliance with Receiving Water Limitations, an Effluent Limitations has been established at the point of discharge for turbidity. An Effluent Limitation for turbidity is included in this Order and is based on the Basin Plan water quality objectives for chemical constituents and turbidity and the DHS Secondary MCL.

This Order includes an average monthly effluent turbidity limitation.

- x. **Vanadium**—Vanadium in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a level necessary to protect the beneficial use of agricultural irrigation, and, therefore to violate the Basin Plan's narrative toxicity objective. *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985), recommends that the vanadium concentration in waters used for agricultural irrigation not exceed 100 µg/L. Applying the Basin Plan "Policy for Application of Water Quality Objectives", the numeric standard that implements the narrative objective is the Agricultural Water Quality Goal of 100 µg/L.

The observed vanadium MEC was detected in a sample collected 9 June 2003 at a concentration of 229 µg/L. The recommended maximum concentration for protection of agricultural uses is 100 µg/L. The observed vanadium MEC is greater than the water quality standard; therefore, an Effluent Limitation for vanadium is required. The Effluent Limitation for vanadium included in this Order is presented in total recoverable concentration, and is based on protection of the beneficial use of agricultural irrigation.

This Order includes an average monthly Effluent Limitation for vanadium that is equal to the agricultural goal.

- y. **Zinc**—The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the NTR criteria for zinc. The CTR includes hardness-dependent criteria for the protection of freshwater aquatic life for zinc. The criteria for zinc are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for zinc in freshwater are 0.978 for the acute criteria and 0.986 for the chronic criteria.

The observed zinc MEC was detected in a sample collected 9 June 2003 at a concentration of 878 µg/L. Using the worst-case ambient (lowest receiving water) measured hardness of (15 mg/L), the applicable chronic criterion (maximum four-day average concentration) and the applicable acute criterion (maximum one-hour average concentration) are both 24 µg/L. The observed zinc MEC is greater than the water quality criteria; therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for zinc and Effluent Limitations for zinc are required. The Effluent Limitations for zinc included in this Order are presented in total concentrations, and are based on CTR criteria for the protection of freshwater aquatic life.

The SIP requires converting CTR chronic (four-day) and acute (one-hour) aquatic life criteria to average monthly and maximum daily effluent limitations based on the variability of the existing data and the expected frequency of monitoring. Equations summarizing the conversion are shown below:

$$\begin{aligned} CCC &= e^{[0.8473 \ln(\text{hardness}) + 0.884]} = 24 \text{ } \mu\text{g/L} \\ CMC &= e^{[0.8473 \ln(\text{hardness}) + 0.884]} = 24 \text{ } \mu\text{g/L} \\ AMEL &= 1.55[\min(0.321CMC, 0.527CCC)] = 12 \text{ } \mu\text{g/L} \\ MDEL &= 3.11[\min(0.321CMC, 0.527CCC)] = 24 \text{ } \mu\text{g/L} \end{aligned}$$

This Order includes average monthly and maximum daily effluent zinc limitations.

4. **WQBEL Calculations**

- a. The Discharger and Regional Water Board staff conducted monitoring for inorganic and conventional pollutants. The analytical results were submitted to the Regional Water Board. Limited data are available for the discharge. Samples were collected from a variety of locations, as shown on Attachment B (page B-2). The results of these sampling events were used in developing this Order. Detectable results from these analyses are summarized in Tables F-2 and F-3 (see below).

Table F-2—Empire Mine SHP, Order No. R5-2006-0058: CTR+ Detectable Results (µg/L)

Constituents	DP ¹ 2/1/2002	DF ² 2/24/2003	EP ⁴ 2/24/2003	JD ³ 6/9/2003	DF ² 6/9/2003	EP ⁴ 6/9/2003	AP ⁵ 6/9/2003	AP ⁵ 2/25/2004	DF ² 2/25/2004	Portal Pool 2/25/2004
Aluminum	--	--	--	36,100	ND	28.2 ⁶	26.5 ⁶	--	--	--
Antimony	--	--	--	98.9	ND	ND	ND	--	--	--
Arsenic	77.2	87.4	43.6	35,400	43.6	51.9	23.4	68.2	52.4	46.4
Barium	--	--	--	2480	15.6	15.7	15.9	--	--	--
Beryllium	--	--	--	2.6	ND	ND	ND	--	--	--
Cadmium	--	--	--	494	0.61 ⁶	0.67 ⁶	0.35 ⁶	--	--	--
Calcium	--	--	--	51,400	63,700	62300	63,000	--	--	--
Chromium (total)	--	--	--	53.4	1.5 ⁶	0.88 ⁶	2.3 ⁶	--	--	--
Cobalt	--	--	--	257	1.4 ⁶	1.2 ⁶	1.2 ⁶	--	--	--
Copper	--	--	--	41.5	ND	ND	ND	--	--	--
Iron	5,870	5,190	2,770	4,760,000	2,420	2,860	1,320	9,520	6,130	5,410
Lead	ND	--	--	146	ND	ND	1.5 ⁶	--	--	--
Magnesium	--	--	--	22,600	11,800	11,600	11,600	--	--	--
Manganese	--	--	--	172,000	2,310	2,370	1,550	1570	2,260	2,370
Mercury	ND	--	--	1.2	0.11 ⁶	0.057 ⁶	0.10 ⁶	--	--	--
Molybdenum	--	--	--	5.9	ND	ND	1.5 ⁶	--	--	--
Nickel	--	--	--	15.6	ND	1.4 ⁶	ND	--	--	--
Potassium	--	--	--	4,740	1,060	1,050	1,060	--	--	--
Selenium	--	--	--	ND	ND	2.1 ⁶	ND	--	--	--
Sodium	--	--	--	10,300	9,910	9,660	9,930	--	--	--
Thallium	--	--	--	361	5.6 ⁶	4.9 ⁶	4.0 ⁶	ND	2.6 ⁶	2.4
Vanadium	--	--	--	229	ND	ND	ND	--	--	--
Zinc	--	--	--	878	8.4 ⁶	2.7 ⁶	7.0 ⁶	--	--	--
Chloride (mg/L)	--	--	--	6.0	6.0	6.0	6.0	--	--	7.0
Nitrate (mg/L as NO ₃)	--	--	--	2.0	2.0	2.0	2.0	--	--	0.6
Specific Conductance (µmhos/cm)	--	611	573	187	--	--	--	248	471	478
Sulfate (mg/L)	--	--	--	110	110	110	110	--	--	160
Dissolved Oxygen (mg/L)	--	--	--	8.6	--	--	--	6.4	5.9	5.2
pH	--	6.95	6.75	6.45	--	--	--	6.65	6.54	6.70
Total Suspended Solids (mg/L)	--	3	1	1,840	4	7	4	22	ND	ND
Total Dissolved Solids (mg/L)	--	--	--	299	297	296	285	--	--	415

¹ DP – Magenta Drain Portal
² DF – Residential Footbridge
³ JD – Magenta Drain Junction (Magenta Drain Tunnel)
⁴ EP – Exit Portal
⁵ AP – At Tennis Courts Above Park
⁶ J Flag (estimated concentration)

Table F-2—Empire Mine SHP, Order No. R5-2006-0058: CTR+ Detectable Results (µg/L)

Constituents	DP ¹ 2/25/2004	AP 3/25/2004	DF 3/25/2004	Portal Pool 3/25/2004	Portal 3/25/2004	Braid 3/25/2004	EP ⁴ 1/19/2006
Aluminum	--	--	--	--	--	--	ND
Antimony	--	--	--	--	--	--	ND
Arsenic	54.0	30.3	60.7	59.4	58.0	--	57
Barium	--	--	--	--	--	--	21
Beryllium	--	--	--	--	--	--	ND
Cadmium	--	--	--	--	--	--	ND
Calcium	--	--	--	--	--	--	--
Chromium (total)	--	--	--	--	--	--	ND
Cobalt	--	--	--	--	--	--	ND
Copper	--	--	--	--	--	--	ND
Iron	6,260	2,740	5,690	5,800	5,910	--	4,900
Lead	--	--	--	--	--	--	ND
Magnesium	--	--	--	--	--	--	--
Manganese	2,340	1,900	2,680	2,670	2,640	--	2,300
Mercury	--	--	--	--	--	--	ND
Molybdenum	--	--	--	--	--	--	ND
Nickel	--	--	--	--	--	--	4.3
Potassium	--	--	--	--	--	--	--
Selenium	--	--	--	--	--	--	ND
Sodium	--	--	--	--	--	--	--
Thallium	2.9	ND	5.3	4.9	5	--	ND
Vanadium	--	--	--	--	--	--	ND
Zinc	--	--	--	--	--	--	63
Chloride (mg/L)	7.3	--	--	7.8	10.9	--	--
Nitrate (mg/L as NO ₃)	0.68	--	--	0.56	0.53	--	--
Specific Conductance (µmhos/cm)	492	638	676	685	684	667	--
Sulfate (mg/L)	161	--	--	187	187	--	--
Dissolved Oxygen (mg/L)	4.9	7.83	5.95	5.65	5.7	7.8	--
pH	6.57	7.33	6.75	6.64	6.65	7.18	--
Total Suspended Solids (mg/L)	95	7	13	11	12	--	6.4
Total Dissolved Solids (mg/L)	461	458	436	483	471	--	350

Table F-3—Empire Mine SHP Order No. R5-2006-0058: Reasonable Potential Statistics Summary (µg/L)					
Constituent	Max.	Mean	s	CV¹	# Results²
Aluminum	36,100	7,250	16,100	0.600	5
Antimony	98.9	23.4	42.2	0.600	5
Arsenic	35,400	2,260	8,840	3.904	16
Barium	2,480	510	1,100	0.600	5
Beryllium	2.6	1.2	0.80	0.600	5
Cadmium	494	99.2	5,830	0.600	5
Calcium	63,700	60,100	221	0.600	4
Chromium (total)	53.4	11.7	23.3	0.600	5
Cobalt	257	52.4	114	0.600	5
Copper	41.5	11.5	16.9	0.600	5
Iron	4,760,000	302,000	1,190,000	3.936	16
Lead	146	30.0	57.6	0.600	6
Magnesium	22,600	14,400	5,470	0.600	4
Manganese	172,000	15,300	47,100	3.076	13
Mercury	1.2	0.43	0.52	0.600	6
Molybdenum	5.9	4.5	3.5	0.600	5
Nickel	15.6	5.26	5.87	0.600	5
Potassium	4,740	1,980	1,840	0.600	4
Selenium	2.1	3.9	1.5	0.600	5
Sodium	10,300	9,950	264	0.600	4
Thallium	361	30.8	99.2	3.221	13
Vanadium	229	49.1	101	0.600	5
Zinc	878	192	384	0.600	5
Chloride (mg/L)	7.3	7.1	1.7	0.600	8
Nitrate (mg/L as NO ₃)	2.0	1.3	0.75	0.600	8
Specific Conductance (µmhos/cm)	685	534	169	0.316	12
Sulfate (mg/L)	161	142	35.5	0.600	8
Dissolved Oxygen (mg/L)	4.9 ³	6.39	1.25	0.195	10
pH (standard units)	7.33/6.45 ³	--	--	--	12
Total Suspended Solids (mg/L)	1,840	136	472	3.479	15
Total Dissolved Solids (mg/L)	461	386	81.2	0.210	11

¹ Coefficient of variation. Defaults to 0.6 for less than ten samples and/or 80% or more of results are non-detect.

² Number of data points considered in assessing reasonable potential and in determining effluent limitations.

³ Minimum

b. Effluent Limitations for water quality-based limitations were calculated in accordance with Section 1.4 of the SIP and the TSD. The following paragraphs describe the general methodology used for calculating Effluent Limitations.

c. *Calculations for Effluent Limitations*—In calculating maximum effluent limitations, the effluent concentration allowances were set equal to the criteria/standards/objectives.

$$ECA_{acute} = CMC \quad ECA_{chronic} = CCC \quad ECA_{HH} = HH$$

where:

- ECA_{acute} = effluent concentration allowance for acute (one-hour average) toxicity criterion
- $ECA_{chronic}$ = effluent concentration allowance for chronic (four-day average) toxicity criterion
- ECA_{HH} = effluent concentration allowance for human health, agriculture, or other long-term criterion/objective
- CMC = criteria maximum concentration (one-hour average)
- CCC = criteria continuous concentration (four-day average, unless otherwise noted)
- HH = human health, agriculture, or other long-term criterion/objective

Acute and chronic toxicity ECAs were then converted to equivalent long-term averages (LTA) using statistical multipliers and the lowest LTA was used. Additional statistical multipliers were then used to calculate the maximum daily effluent limitation (MDEL) and the average monthly effluent limitation (AMEL). The statistical multipliers were calculated using data shown in Table F-1.

Human health ECAs are set equal to the AMEL and a statistical multiplier is used to calculate the MDEL.

$$AMEL = mult_{AMEL} \left[\min \left(\overbrace{M_A ECA_{acute}, M_C ECA_{chronic}}^{LTA_{acute}} \right) \right]$$

$$MDEL = mult_{MDEL} \left[\min \left(M_A ECA_{acute}, \underbrace{M_C ECA_{chronic}}_{LTA_{chronic}} \right) \right]$$

$$MDEL_{HH} = \left(\frac{mult_{MDEL}}{mult_{AMEL}} \right) AMEL_{HH}$$

where:

- $mult_{AMEL}$ = statistical multiplier converting minimum LTA to AMEL
- $mult_{MDEL}$ = statistical multiplier converting minimum LTA to MDEL
- M_A = statistical multiplier converting CMC to LTA
- M_C = statistical multiplier converting CCC to LTA

d. *Use of Assimilative Capacity*—Based on the available information, the worst-case dilution is assumed to be zero to provide protection for the receiving water beneficial uses. The impact of assuming zero assimilative capacity within the receiving water is that discharge limitations are end-of-pipe limits with no allowance for dilution within the receiving water.

**Summary of Water Quality-based Effluent Limitations
 Discharge Point EFF-001**

Parameter	Units	Effluent Limitations			
		Average Monthly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Settleable Solids	mL/L-hr	0.1	0.2	--	--
pH	standard units	--	--	6.5	8.5
Turbidity	NTU	5	--	--	--
Color	color units	15	--	--	--
Aluminum, Total Recoverable	µg/L	71	140	--	--
Antimony, Total Recoverable	µg/L	6	--	--	--
Arsenic, Total Recoverable	µg/L	10	--	--	--
Barium, Total Recoverable	µg/L	1,000	--	--	--
Cadmium, Total Recoverable	µg/L	0.26	0.53	--	--
Chromium (III)	µg/L	36	72	--	--
Cobalt, Total Recoverable	µg/L	50	--	--	--
Copper, Total Recoverable	µg/L	1.2	2.3	--	--
Iron, Total Recoverable	µg/L	300	--	--	--
Lead, Total Recoverable	µg/L	0.23	0.47	--	--
Manganese, Total Recoverable	µg/L	50	--	--	--
Mercury, Total Recoverable	µg/L	0.050	0.10	--	--
Nickel, Total Recoverable	µg/L	8.6	17	--	--
Thallium, Total Recoverable	µg/L	1.7	5.6	--	--
Vanadium, Total Recoverable	µg/L	100	--	--	--
Zinc, Total Recoverable	µg/L	12	24	--	--

Acute Toxicity: Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

Minimum for any one bioassay - - - - - 70%
 Median for any three consecutive bioassays - - - - 90%

Dissolved Oxygen: Dissolved oxygen in the discharge shall be no less than:

85 percent of saturation as the monthly median of the mean daily dissolved oxygen concentration;
 75 percent of saturation as the 95 percentile dissolved oxygen concentration; and
 7.0 mg/L at any time.

5. Whole Effluent Toxicity (WET)

The Basin Plan states that “[a]ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.” [p III-8.00] The Basin Plan requires that “[a]s a minimum, compliance with this objective...shall be evaluated with a 96-hour bioassay.” This Order requires both acute and chronic toxicity monitoring to evaluate compliance with this water quality objective.

- a. **Acute Aquatic Toxicity:** The Basin Plan further states that “...effluent limits based upon acute biotoxicity tests of effluents will be prescribed...”. Effluent limitations for acute toxicity are included in this Order. This Order includes the following limitation for acute toxicity:

Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

Minimum for any one bioassay - - - - - 70%
Median for any three consecutive bioassays - - - - 90%

- b. **Chronic Aquatic Toxicity.** Attachment E of this Order requires two quarters per year of chronic WET monitoring for demonstration of compliance with the narrative toxicity objective.

D. Final Effluent Limitations

1. **Production.** 40 CFR §122.45 states that:

“Except in the case of POTWs..., calculation of any permit limitations, standards, or prohibitions which are based on production (or other measure of operation) shall be based not upon the designed production capacity but rather upon a reasonable measure of actual production of the facility. For new sources or new dischargers, actual production shall be estimated using projected production.”

This Order permits a long-existing, but previously unpermitted discharge. At this time, the discharge cannot be tied to production as the Empire Mine State Historic Park is not currently in, nor planning to be, in active production of a mined ore. No production-based limitations are included in this Order.

2. **Limitation Periods.** 40 CFR §122.45 states that:

“For continuous discharges all permit effluent limitations, standards, and prohibitions, including those necessary to achieve water quality standards, shall unless impracticable be stated as...[m]aximum daily and average monthly discharge limitations for all dischargers

other than publicly owned treatment works... ”.

3. Mass Limitations.

- a. 40 CFR §122.45(f) states that:

“All pollutants limited in permits shall have limitations...expressed in terms of mass except...[f]or pH, temperature, radiation, or other pollutants which cannot appropriately be expressed by mass...Pollutants limited in terms of mass additionally may be limited in terms of other units of measurement, and the permit shall require the permittee to comply with both limitations.”

- b. USEPA elaborates on the topic in *U.S. EPA Technical Support Document for Water Quality-Based Toxics Control* [EPA/505/2-90-001] (TSD), where it states (section 5.7.1, pp. 110-111) that:

“Mass-based effluent limits are required by NPDES regulations at 40 CFR 122.45(f). The regulation requires that all pollutants limited in NPDES permits have limits, standards, or prohibitions expressed in terms of mass with three exceptions, including one for pollutants that cannot be expressed appropriately as mass. Examples of such pollutants are pH, temperature, radiation, and whole effluent toxicity. Mass limitations in terms of pounds per day or kilograms per day can be calculated for all chemical-specific toxics such as chlorine or chromium. Mass-based limits should be calculated using concentration limits at critical flows. For example, a permit limit of 10 mg/l of cadmium discharged at an average rate of 1 million gallons per day also would contain a limit of 38 kilograms/day of cadmium.

Mass-based limits are particularly important for control of bioconcentratable pollutants. Concentration-based limits will not adequately control discharges of these pollutants if the effluent concentrations are below detection levels. For these pollutants, controlling mass loadings to the receiving water is critical for preventing adverse environmental impacts.

However, mass-based effluent limits alone may not assure attainment of water quality standards in waters with low-dilution. In these waters, the quantity of effluent discharged has a strong effect on the instream dilution and therefore on the RWC [receiving water concentration]. At the extreme case of a stream that is 100 percent effluent, it is the effluent concentration rather than the effluent mass discharge that dictates the instream concentration. Therefore, EPA recommends that permit limits on both mass and concentration be specified for effluents discharging into waters with less than 100 fold dilution to ensure attainment of water quality standards.”

Less than 100-fold dilution is available. Mass limitations are required.

- c. Treatment systems are designed based on hydraulic loading, concentration, and mass loading. Criteria are expressed in concentration. If a treatment system is designed on a

- mass-loading basis, this Order may be reopened and mass limitations added.
- d. Flow data for the discharge are extremely limited and are insufficient for the calculation of mass loading limitations. This Order requires the Discharger to monitor flow, in part to develop a database sufficient to determine appropriate mass loading limitations. Once sufficient flow data are available, this Order may be reopened and mass limitations added.

**Summary of Final Effluent Limitations
 Discharge Point EFF-001**

Parameter	Units	Effluent Limitations			
		Average Monthly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Total Suspended Solids	mg/L	20	30	--	--
Settleable Solids	mL/L-hr	0.1	0.2	--	--
pH	standard units	--	--	6.5	8.5
Turbidity	NTU	5	--	--	--
Color	color units	15	--	--	--
Aluminum, Total Recoverable	µg/L	71	140	--	--
Antimony, Total Recoverable	µg/L	6	--	--	--
Arsenic, Total Recoverable	µg/L	10	--	--	--
Barium, Total Recoverable	µg/L	1,000	--	--	--
Cadmium, Total Recoverable	µg/L	0.26	0.53	--	--
Chromium (III)	µg/L	36	72	--	--
Cobalt, Total Recoverable	µg/L	50	--	--	--
Copper, Total Recoverable	µg/L	1.2	2.3	--	--
Iron, Total Recoverable	µg/L	300	--	--	--
Lead, Total Recoverable	µg/L	0.23	0.47	--	--
Manganese, Total Recoverable	µg/L	50	--	--	--
Mercury, Total Recoverable	µg/L	0.050	0.10	--	--
Nickel, Total Recoverable	µg/L	8.6	17	--	--
Thallium, Total Recoverable	µg/L	1.7	5.6	--	--
Vanadium, Total Recoverable	µg/L	100	--	--	--
Zinc, Total Recoverable	µg/L	12	24	--	--

Acute Toxicity: Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

- Minimum for any one bioassay - - - - - 70%
- Median for any three consecutive bioassays - - - - 90%

Dissolved Oxygen: Dissolved oxygen in the discharge shall be no less than:

- 85 percent of saturation as the monthly median of the mean daily dissolved oxygen concentration;
- 75 percent of saturation as the 95 percentile dissolved oxygen concentration; and
- 7.0 mg/L at any time.

E. Interim Effluent Limitations

As stated in the above Findings, the USEPA adopted the NTR and the CTR, which contains water quality standards applicable to this discharge and the SIP contains guidance on implementation of the NTR and CTR. The SIP, Section 2.2.1, requires that if a compliance schedule is granted for a CTR or NTR constituent, the Regional Water Board shall establish interim requirements and dates for their achievement in the NPDES permit. The interim limitations must: be based on current treatment plant performance or existing permit limitations, whichever is more stringent; include interim compliance dates separated by no more than one year; and be included in the Provisions. Interim limitations for constituents with CTR/NTR-based final effluent limitations in this Order are based on current performance.

In this case, the long-term objective is to maintain, at a minimum, the current performance level. Interim limitations are established when compliance with NTR- and CTR-based Effluent Limitations cannot be achieved by the existing discharge. Discharge of constituents in concentrations in excess of the final Effluent Limitations, but in compliance with the interim Effluent Limitations, can significantly degrade water quality and adversely affect the beneficial uses of the receiving stream on a long-term basis. For example, USEPA states in the Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life for copper, that it will take an unstressed system approximately three years to recover from a pollutant in which exposure to copper exceeds the recommended criterion. The interim limitations, however, establish an enforceable ceiling concentration until compliance with the Effluent Limitation can be achieved.

Interim effluent limitation calculations were based on projection methods contained in the USEPA Technical Support Document for Water Quality-Based Toxics Control [EPA/505/2-90-001]. Interim effluent limitations for constituents with CTR/NTR-based effluent limitations were based on the projected MEC (maximum detected effluent concentration) for each constituent. The projected MEC is determined by multiplying the observed MEC by a factor that accounts for statistical variation. The multiplying factor is determined (for 99% confidence level and 99% probability basis) using the number of results available and the coefficient of variation (standard deviation divided by the mean) of the sample results. In accordance with the SIP, non-detect results were counted as one-half the detection level when calculating the mean. The default coefficient of variation for constituents with fewer than ten samples and/or for which 80% or more of the sample results were non-detect is 0.6.

$$p_n = (1 - \text{confidence level})^{1/n} \quad C_{99} = (2.326\sigma - 0.5\sigma^2) \quad C_p = (z\sigma - 0.5\sigma^2)$$

where:

- p_n = percentile represented by the highest concentration in the available data
- n = number of available samples
- C_{99} = numerator for projection factor
- C_p = denominator for projection factor
- σ^2 = $\ln(CV^2 + 1)$
- CV = coefficient of variation; calculated as the standard deviation divided by

the mean
 $z =$ normal distribution value for p_n percentile
 2.326 = normal distribution value for 99th percentile

The projected MEC is equal to the observed MEC multiplied by $\frac{C_{99}}{C_{p_n}}$. Projected maximum effluent concentrations were set equal to interim average monthly effluent limitations and a statistical multiplier was used to calculate the interim MDEL.

$$MDEL_{interim} = \left(\frac{mult_{MDEL}}{mult_{AMEL}} \right) AMEL_{interim}$$

where: $\left(\frac{mult_{MDEL}}{mult_{AMEL}} \right) =$ statistical multiplier converting AMEL to MDEL

Projected MECs, intermediate calculation values, and interim effluent limitations are shown in the following table.

Constituent	Observed MEC (µg/L)	p_n	C_{99}	z	σ^2	C_p	Projected MEC/ Interim AMEL (µg/L)	Interim MDEL (µg/L)
Cadmium, Total Recoverable	494	0.3981	3.114	-0.2582	0.3075	0.7431	2,100	4,200
Chromium (III)	53.4	0.3981	3.114	-0.2582	0.3075	0.7431	220	450
Copper, Total Recoverable	41.5	0.3981	3.114	-0.2582	0.3075	0.7431	170	350
Lead, Total Recoverable	146	0.4642	3.114	-0.0900	0.3075	0.8158	560	1,100
Mercury, Total Recoverable	1.2	0.4642	3.114	-0.0900	0.3075	0.8158	4.6	9.2
Nickel, Total Recoverable	15.6	0.3981	3.114	-0.2582	0.3075	0.7431	65	130
Thallium, Total Recoverable	361	0.7017	11.15	0.5293	2.4313	0.6768	5,900	20,000
Zinc, Total Recoverable	878	0.3981	3.114	-0.2582	0.3075	0.7431	3,700	7,400

For non-CTR/NTR-based Effluent Limitations, any necessary time schedules were generally included in the accompanying time schedule order (see VII.7.a at page F-53).

F. Land Discharge Specifications—*Not Applicable*

G. Reclamation Specifications—*Not Applicable*

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

A. Surface Water

1. The CWA, Section 303(a-c), required states to adopt numeric criteria where they are necessary to protect designated uses. The Regional Water Board adopted numeric criteria in the Basin Plan. The Basin Plan is a regulatory reference for meeting the state and federal

requirements for water quality control (40 CFR §131.20). State Water Board Resolution No. 68-16, the Antidegradation Policy, does not allow changes in water quality less than that prescribed in Water Quality Control Plans (Basin Plans). The Basin Plan states that “[t]he numerical and narrative water quality objectives define the least stringent standards that the Regional Water Board will apply to regional waters in order to protect the beneficial uses.” This Order contains Receiving Water Limitations based on the Basin Plan numerical and narrative water quality objectives for biostimulatory substances, chemical constituents, color, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, salinity, sediment, settleable material, suspended material, tastes and odors, temperature, toxicity and turbidity.

2. **Dissolved Oxygen**—The unnamed tributary to the South Fork of Wolf Creek has, via the tributary rule, been designated as having the beneficial use of cold freshwater aquatic habitat (COLD). For water bodies designated as having COLD as a beneficial use, the Basin Plan includes a water quality objective of maintaining a minimum of 7.0 mg/L of dissolved oxygen. Since the beneficial use of COLD does apply to the Bear River, a receiving water limitation of 7.0 mg/L for dissolved oxygen was included in this Order.

For surface water bodies outside of the Delta, the Basin Plan includes the water quality objective that “...the monthly median of the mean daily dissolved oxygen (DO) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation.” This objective was included as a receiving water limitation in this Order.

3. **Fecal Coliform Organisms**—The unnamed tributary to the South Fork of Wolf Creek has, via the tributary rule, been designated as having the beneficial use of contact recreation (REC-1). For water bodies designated as having REC-1 as a beneficial use, the Basin Plan includes a water quality objective limiting the “...fecal coliform concentration based on a minimum of not less than five samples for any 30-day period...” to a maximum geometric mean of 200 MPN/100 ml. The objective also states that “...[no] more than ten percent of the total number of samples taken during any 30-day period [shall] exceed 400/100 ml.” This objective is included in this Order as a receiving water limitation.
4. **pH**—For all surface water bodies in the Sacramento River and San Joaquin River basins (except for Goose Lake), the Basin Plan includes water quality objectives stating that “[t]he pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses.” This Order includes receiving water limitations for both pH range and pH change.

The Basin Plan allows an appropriate averaging period for pH change in the receiving stream. Since there is no technical information available that indicates that aquatic organisms are adversely affected by shifts in pH within the 6.5 to 8.5 range, an averaging period is considered appropriate and a monthly averaging period for determining compliance with the 0.5 receiving water pH limitation is included in this Order.

5. **Temperature**—The Bear River has the beneficial uses of both COLD and WARM. The Basin Plan includes the objective that “[a]t no time or place shall the temperature of COLD

or WARM intrastate waters be increased more than 5°F above natural receiving water temperature.” This Order includes a receiving water limitation based on this objective.

2. ***Turbidity***—The Basin Plan includes the following objective: “*Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:*”
 - *Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.*
 - *Where natural turbidity is between 5 and 10 NTUs, increases shall not exceed 20 percent.*
 - *Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTU.*
 - *Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.”*

B. Groundwater—*Not Applicable*

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

Section 122.48 of 40 CFR requires all NPDES permits to specify recording and reporting of monitoring results. Sections 13267 and 13383 of the California Water Code authorize the Water Boards to require technical and monitoring reports. The Monitoring and Reporting Program, Attachment E of this Order, establishes monitoring and reporting requirements to implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the Monitoring and Reporting Program for this facility.

A. Influent Monitoring—*Not Applicable*

B. Effluent Monitoring

1. Pursuant to the requirements of 40 CFR §122.44(i)(2) effluent monitoring is required for all constituents with effluent limitations. Effluent monitoring is necessary to assess compliance with effluent limitations, assess the effectiveness of the treatment process, and to assess the impacts of the discharge on the receiving stream.
2. Flow data for the discharge are extremely limited and are insufficient for the calculation of mass loading limitations. This Order requires the Discharger to monitor flow, in part to develop a database sufficient to determine mass loading to the receiving stream.
3. This Order includes effluent monitoring requirements for other constituents of concern.
 - a. *Cyanide*—No data have been collected for cyanide in the discharge. The historic use of cyanide at the Empire Mine State Historic Park warrants monitoring of the discharge for cyanide.
 - b. *Chromium, Hexavalent (VI)*— The Discharger did not provide any information regarding the levels of chromium III or chromium VI in the discharge. The Discharger did, however, provide data for total chromium in the effluent. Chromium can exist in eight valence states, ranging from -2 to +6. Chromium III is the most stable valence state,

followed by chromium VI. Total chromium in the effluent is likely to be in the chromium III state and total chromium data were used in determining the need for Effluent Limitations for chromium III. Although chromium III is the most stable valence state, chromium VI data are needed to calculate chromium III (difference between total recoverable chromium and chromium VI) in the discharge and to verify compliance with Effluent Limitations for chromium III. In addition, water quality standards exist for chromium VI. Information is necessary to determine if reasonable potential to cause or contribute to an exceedance of a water quality standard for chromium VI exists.

- c. *Methylmercury*—No data have been collected, nor water quality standards adopted, for methylmercury in the discharge or the receiving stream. Regional Water Board staff are preparing a TMDL for methylmercury in California’s Central Valley. Data submitted for total recoverable mercury in the discharge indicate elevated mercury concentrations. Methylmercury in the discharge may also be elevated, particularly if the discharge is low in dissolved oxygen or was previously contained in a low-oxygen environment. This Order requires effluent monitoring for methylmercury to assess possible effects on the receiving waters and to assist in the development of the methylmercury TMDL.
4. This Order requires effluent monitoring for constituents that have not been detected above applicable water quality standards, but which are projected to exceed standards based on probability and statistics. For these constituents, projected MECs (maximum effluent concentration) were calculated based on projection methods contained in the USEPA Technical Support Document for Water Quality-Based Toxics Control [EPA/505/2-90-001]. The projected MEC (maximum effluent concentration) is determined by multiplying the observed MEC by a factor that accounts for statistical variation. The multiplying factor is determined (for 99% confidence level and 99% probability basis) using the number of results available and the coefficient of variation (standard deviation divided by the mean) of the sample results. In accordance with the SIP, non-detect results were counted as one-half the detection level when calculating the mean. The default coefficient of variation for constituents with fewer than ten samples and/or for which 80% or more of the sample results were non-detect is 0.6.

$$p_n = (1 - \text{confidence level})^{1/n} \quad C_{99} = (2.326\sigma - 0.5\sigma^2) \quad C_p = (z\sigma - 0.5\sigma^2)$$

where:

- p_n = percentile represented by the highest concentration in the available data
- n = number of available samples
- C_{99} = numerator for projection factor (desired confidence level)
- C_p = denominator for projection factor (existing confidence level)
- σ^2 = $\ln(CV^2 + 1)$
- CV = coefficient of variation; calculated as the standard deviation divided by the mean
- z = normal distribution value for p_n percentile
- 2.326 = normal distribution value for 99th percentile

The projected MEC is equal to the observed MEC multiplied by $\frac{C_{99}}{C_{pn}}$. Projected maximum effluent concentrations were compared to water quality standards

Projected MECs and intermediate calculation values are shown in the following table.

Constituent	Observed MEC (µg/L)	p_n	C_{99}	z	σ^2	C_p	Projected MEC (µg/L)	Water Quality Standard
Beryllium, Total Recoverable	2.6	0.3981	3.114	-0.2582	0.3075	0.7431	11	4 (Primary MCL)
Electrical Conductivity (µmhos/cm)	685	0.6813	1.953	0.4713	0.0949	1.1027	1,210	700 (Agricultural Goal)
Molybdenum, Total Recoverable	5.9	0.3981	3.114	-0.2582	0.3075	0.7431	25	10 (Agricultural Goal)
Selenium, Total Recoverable	2.1	0.3981	3.114	-0.2582	0.3075	0.7431	8.8	5.0 (CTR)
Sulfate (mg/L)	161	0.5623	3.114	0.1569	0.3075	0.9354	623	250 (Secondary MCL)

C. Whole Effluent Toxicity Testing Requirements

The Basin Plan states that “[a]ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.” The Basin Plan requires that “[a]s a minimum, compliance with this objective...shall be evaluated with a 96-hour bioassay.” This Order requires both acute and chronic toxicity monitoring to evaluate compliance with this water quality objective.

The receiving surface water for the Empire Mine State Historic Park’s Magenta Drain portal is an unnamed tributary to the South Fork of Wolf Creek, an inland surface water providing freshwater aquatic habitat. Beneficial uses of the unnamed tributary to the South Fork of Wolf Creek include warm freshwater habitat (WARM); cold freshwater habitat (COLD); warm and cold migration of aquatic organisms (MIGR); warm and cold spawning, reproduction, and/or early development (SPWN); and wildlife habitat (WILD). Given that the receiving stream has beneficial uses of cold freshwater habitat, cold migration of aquatic organisms, and cold spawning, reproduction, and/or early development, it is appropriate to use a cold/warm-water species such as *O. mykiss* (rainbow trout) for aquatic toxicity bioassays.

USEPA has approved test methods for of *Pimephales promelas*, *Selenastrum capricornutum*, and *Ceriodaphnia dubia* for assessing chronic toxicity in freshwater organisms.

D. Receiving Water Monitoring

1. Surface Water

- a. Receiving water monitoring is necessary to assess compliance with receiving water limitations and to assess the impacts of the discharge on the receiving stream. Pursuant to CWC 13267, monitoring is required to assess water quality and to assess impacts to receiving streams.

2. Groundwater—*Not Applicable*

E. Other Monitoring Requirements—*Not Applicable*

VII. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which in accordance with 40 CFR §§122.41 and 122.42, apply to all NPDES discharges and must be included in every NPDES permit, are provided in Attachment D to the Order.

Title 40 CFR Section 122.41(a)(1) and (b) through (n) establish conditions that apply to all state-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. 40 CFR Section 123.25(a)(12) allows the State to omit or modify conditions to impose more stringent requirements. In accordance with Section 123.25, this Order omits federal conditions that address enforcement authority specified in 40 CFR Sections 122.41(j)(5) and (k)(2) because the enforcement authority under the CWC is more stringent. In lieu of these conditions, this Order incorporates by reference CWC section 13387(e).

B. Special Provisions

1. Reopener Provisions

- a. **New Standards.** Upon adoption of any applicable water quality standard for receiving waters, including, but not limited to, a mercury total maximum daily load (TMDL), by the Regional Water Board or the State Water Board pursuant to the CWA and regulations adopted thereunder, this permit may be reopened and limitations based on the new standard added.
- b. **Constituent Study.** If, after review of the results of the study required in VI.C.2.a or routine monitoring required in the Monitoring and Reporting Program (Attachment E), it is determined that the discharge has reasonable potential to cause or contribute to an exceedance of a water quality objective, this Order may be reopened and effluent limitations added for the subject constituents.

- c. **Hardness.** This Order requires characterization of the receiving stream hardness and the discharge. If the results of the characterization indicate a different ambient hardness, this Order may be reopened and modified.
- d. **Salinity.** Various possible treatment techniques for the discharge have the potential to either increase or decrease the salinity of the effluent. If TDS in the discharge following implementation of any potential treatment techniques continues to exceed the Agricultural Water Quality Goal, this Order may be reopened and Effluent Limitations for TDS added.
- e. **Mass Limitations.** If a treatment system is designed on a mass-loading basis, this Order may be reopened and mass limitations added.
- f. **Whole Effluent Toxicity.** As a result of a Toxicity Reduction Evaluation (TRE), this Order may be reopened to include a chronic toxicity limitation, a new acute toxicity limitation, and/or a limitation for a specific toxicant identified in the TRE. Additionally, if a numeric chronic toxicity water quality objective is adopted by the State Water Board, this Order may be reopened to include a numeric chronic toxicity effluent limitation based on that objective.

2. Special Studies and Additional Monitoring Requirements

- a. **Constituent Study.** On 2 March 2000, the State Water Resources Control Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*, also known as the State Implementation Policy (SIP). The SIP established methods of evaluating receiving water criteria and developing effluent limitation in NPDES Permits for the priority pollutants contained in the U.S. Environmental Protection Agency's (USEPA) *California Toxics Rule* and portions of USEPA's *National Toxics Rule*. Section 1.2 of the SIP directs the Regional Water Board to require all NPDES dischargers, pursuant to California Water Code Section 13267, to submit data sufficient to (1) determine if priority pollutants require effluent limitations (reasonable potential analysis) and (2) calculate water quality-based effluent limitations. Further, Section 2.4 of the SIP requires that each discharger submit to the Regional Water Boards reports necessary to determine compliance with effluent limitations for priority pollutants in permits. Sections 2.4.1 through 2.4.4 of the SIP provide minimum standards for analyses and reporting. (Copies of the SIP may be obtained from the State Water Resources Control Board, or downloaded from <http://www.waterboards.ca.gov/iswp/index.html>) To implement the SIP, effluent and receiving water data are needed for all priority pollutants. Effluent and receiving water pH and hardness are required to evaluate the toxicity of certain priority pollutants (such a heavy metals) where the toxicity of the constituents varies with pH and/or hardness. Section 3 of the SIP prescribes mandatory monitoring of dioxin congeners.

In addition to the specific requirements of the SIP, the Regional Water Board is requiring the following monitoring needed for permit development:

- i. Drinking water constituents. Constituents for which drinking water Maximum Contaminant Levels (MCLs) have been prescribed in the California Code of Regulation are included in the *Water Quality Control Plan, Fourth Edition, for the Sacramento and San Joaquin River Basins* (Basin Plan). The Basin Plan defines virtually all surface waters within the Central Valley Region as having existing or potential beneficial uses for municipal and domestic supply. The Basin Plan further requires that, at a minimum, water designated for use as domestic or municipal supply shall not contain concentrations of chemical constituents in excess of the MCLs contained in the California Code of Regulations.
- ii. Effluent and receiving water temperature. This is both a concern for application of certain temperature-sensitive constituents, such as fluoride, and for compliance with the Basin Plan's thermal discharge requirements.
- iii. Effluent and receiving water hardness and pH. These are necessary because several of the CTR constituents are hardness or pH dependent.
- iv. Dioxin and furan sampling. Section 3 of the SIP has specific requirements for the collection of samples for analysis of dioxin and furan congeners, which are detailed in Attachment G. Briefly, dischargers classified as minor must collect and analyze one wet season and one dry season sample.

Pursuant to Section 13267 of the California Water Code, this Order includes a requirement for the Discharger to submit monitoring data for the effluent and receiving water as described in Attachment G.

- b. **Chronic Whole Effluent Toxicity.** The Basin Plan contains a narrative toxicity objective that states, "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at III-8.00.) The Discharger shall conduct the chronic toxicity testing specified in the Monitoring and Reporting Program. If, after commencement of treatment of the discharge, the testing indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the narrative water quality objective for toxicity, this Order requires the Discharger to initiate a Toxicity Identification Evaluation (TIE) to identify the causes of toxicity. Upon completion of the TIE, the Discharger is required to submit a workplan to conduct a Toxicity Reduction Evaluation (TRE) and, after Regional Water Board evaluation, conduct the TRE. This Order may be reopened and a chronic toxicity limitation included and/or a limitation for the specific toxicant identified in the TRE included. Additionally, if a chronic toxicity water quality objective is adopted by the State Water Board, this Order may be reopened and a limitation based on that objective included.
- c. **Regeneration and Sampling Schedule.** Many possible treatment processes for mine drainage discharges utilize absorption processes, which must be regenerated or replaced as the treatment process becomes saturated with pollutants. Pollutant "breakthrough" of the treatment process can be projected allowing for timely regeneration/replacement of the treatment process. Increased sampling should also be undertaken as the age of the

treatment process approaches the regeneration/replacement point. The regeneration/replacement point should be established utilizing a factor of safety to assure there is no “breakthrough” of pollutants. If the Discharger utilizes a treatment process which must be periodically regenerated or replaced, this Order requires the Discharger to comply with the time schedule included in VI.C.2.c in preparing a treatment process regeneration/replacement schedule and a proposed pollutant sampling schedule.

Numerous guidance documents for conducting a TRE are available, as identified below:

- Generalized Methodology for Conducting Industrial TREs, (*EPA/600/2-88/070*), April 1989.
- *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures*, Second Edition, EPA 600/6-91/005F, February 1991.
- *Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I*, EPA 600/6-91/005F, May 1992.
- *Methods for Aquatic Toxicity Identification Evaluations: Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity*, Second Edition, EPA 600/R-92/080, September 1993.
- *Methods for Aquatic Toxicity Identification Evaluations: Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity*, Second Edition, EPA 600/R-92/081, September 1993.
- *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, Fifth Edition, EPA-821-R-02-012, October 2002.
- *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, EPA-821-R-02-013, October 2002.
- *Technical Support Document for Water Quality-based Toxics Control*, EPA/505/2-90-001, March 1991

3. Best Management Practices and Pollution Prevention

- a. Storm water discharges from the Empire Mine State Historic Park are regulated under the General Permit for Discharges of Storm Water Associated with Industrial Activities (State Water Resources Control Board, Water Quality Order No. 97-03-DWQ, NPDES General Permit No. CAS000001). The Discharger’s waste discharge identification (WDID) number for the storm water permit is 5S29I019611.

4. Construction, Operation, and Maintenance Specifications

- a. This Order requires the treatment facilities to be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
- b. This Order, and the Monitoring and Reporting Program which is a part of this permit, requires that certain parameters be monitored on a continuous basis. If the treatment facility is not staffed on a full time basis, permit violations or system upsets could go undetected during periods when operations staff are not present. The Discharger is required to establish an electronic system for operator notification for continuous recording device alarms. For systems installed following permit adoption, the notification system shall be installed simultaneously.

5. Special Provisions for Municipal Facilities (POTWs Only)—*Not Applicable*

6. Other Special Provisions

- a. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code, Sections 6735, 7835, and 7835.1. To demonstrate compliance with Title 16, CCR, Sections 415 and 3065, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

- b. In the event the Discharger does not comply or will be unable to comply for any reason, with any prohibition or limitation contained in this Order, this Order requires the Discharger to notify the Regional Water Board by telephone (916) 464-3291 (or to the Regional Water Board staff engineer assigned to the facility) within 24 hours of having knowledge of such noncompliance, and shall confirm this notification in writing within five days, unless the Regional Water Board waives confirmation. The written notification shall include the information required by Federal Standard Provision V.E.1 [40 CFR §122.41(l)(6)(i)].
- c. Prior to making any change in the discharge point, place of use, or purpose of use of the wastewater, the Discharger must obtain approval of, or clearance from, the State Water Resources Control Board (Division of Water Rights).
- d. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office.

To assume operation 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, address and telephone number of the persons responsible for contact with the Regional Water Board and a statement. The statement shall comply with the signatory paragraph of Federal Standard Provision V.B.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 shall be approved or disapproved in writing by the Executive Officer.

7. Compliance Schedules

The use and location of compliances schedules in the permit depends on the Discharger's ability to comply and the source of the applied water quality criteria.

- a. For non-CTR-based Effluent Limitations, any necessary time schedules were generally included in the accompanying time schedule order.
- b. The SIP, at Section 2.1, states that “[b]ased on an existing discharger’s request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.”

The SIP further states that “[t]he discharger shall submit to the RWQCB the following justification before compliance schedules may be authorized in a permit: (a) documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream, and the results of those efforts; (b) documentation of source control and/or pollution minimization efforts currently underway or completed; (c) a proposed schedule for additional or future source

control measures, pollutant minimization actions, or waste treatment (i.e., facility upgrades); and (d) a demonstration that the proposed schedule is as short as practicable.”

- c. **Cadmium, Chromium (III), Copper, Lead, Mercury, Nickel, Thallium, Zinc Compliance Schedule.** The Discharger submitted a request, and justification (dated 24 April 2006), for a compliance schedule for cadmium, chromium (III), copper, lead, mercury, nickel, thallium, and zinc. The compliance schedule justification included all items specified in Paragraph 3, items (a) through (d), of Section 2.1 of the SIP. This Order establishes a compliance schedule for the new, final, water quality-based effluent limitations for cadmium, chromium (III), copper, lead, mercury, nickel, thallium, and zinc and requires full compliance by **18 May 2010**. As this compliance schedule is greater than one year, this Order requires the Discharger to submit semi-annual progress reports on **31 May** and **30 November** of each year until the Discharger achieves compliance with the final water quality based effluent limitations for cadmium, chromium (III), copper, lead, mercury, nickel, thallium, and zinc.

VIII. PUBLIC PARTICIPATION

The California Regional Water Quality Control Board, Central Valley Region (Regional Water Board) is considering the issuance of waste discharge requirements (WDRs) that will serve as a National Pollutant Discharge Elimination System (NPDES) permit for the Empire Mine State Park. As a step in the WDR adoption process, the Regional Water Board staff has developed tentative WDRs. The Regional Water Board encourages public participation in the WDR adoption process.

A. Notification of Interested Parties

The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. A Notice of Public Hearing (NOPH) was prepared summarizing the project and Regional Water Board procedures. Notification was provided through direct mailing to agencies and known interested parties, posting of the NOPH at the Discharger’s offices ~~and the local post office~~ and publication in the local newspaper.

B. Written Comments

The staff determinations are tentative. Interested persons are invited to submit written comments concerning these tentative WDRs. Comments should be submitted either in person or by mail to the Executive Office at the Regional Water Board at the address above on the cover page of this Order. To be fully responded to by staff and considered by the Regional Water Board, written comments should be received at the Regional Water Board offices by 5:00 p.m. on the date indicated in the transmittal letter for the proposed Order(s).

C. Public Hearing

The Regional Water Board will hold a public hearing on the tentative WDRs during its regular Board meeting on the following date and time and at the following location:

Date: 22/23 June 2006
Time: 8:30 a.m.
Location: Central Valley Regional Water Quality Control Board, Sacramento Office
11020 Sun Center Drive, #200
Rancho Cordova, CA 95670

Interested persons are invited to attend. At the public hearing, the Regional Water Board will hear testimony, if any, pertinent to the discharge, WDRs, and permit. Oral testimony will be heard; however, for accuracy of the record, important testimony should be in writing.

Please be aware that dates and venues may change. Our web address is <http://www.waterboards.ca.gov/centralvalley> where you can access the current agenda for changes in dates and locations.

D. Waste Discharge Requirements Petitions

Any aggrieved person may petition the State Water Resources Control Board to review the decision of the Regional Water Board regarding the final WDRs. The petition must be submitted within 30 days of the Regional Water Board's action to the following address:

State Water Resources Control Board
Office of Chief Counsel
P.O. Box 100, 1001 I Street
Sacramento, CA 95812-0100

E. Information and Copying

The Report of Waste Discharge (RWD), related documents, tentative effluent limitations and special provisions, comments received, and other information are on file and may be inspected at the address above at any time between 8:30 a.m. and 4:45 p.m., Monday through Friday. Copying of documents may be arranged through the Regional Water Board by calling (916) 464-4645.

F. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding the WDRs and NPDES permit should contact the Regional Water Board, reference this facility, and provide a name, address, and phone number.

G. Additional Information

Requests for additional information or questions regarding this order should be directed to Melissa Hall at (916) 464-4757.

Attachment G – Constituent Study

I. SAMPLING FREQUENCY AND NUMBER OF SAMPLES

Samples shall be collected from the effluent and upstream receiving water and analyzed for the constituents listed in Attachment G, section II, to provide the indicated number of valid sample results by the submittal due date. Sampling frequency shall be adjusted so that the appropriate number of samples is collected by the due date and so that the sampling is representative of the wastewater discharge.

Constituent/Sample Type¹	Frequency	Timeframe (years)	Total Number of Samples
Volatile Organics/grab	Quarterly	1	4
Semi-Volatile Organics/grab or composite	Quarterly	1	4
Inorganics/grab or composite	Quarterly	1	4
Pesticides & PCBs/grab or composite	Quarterly	1	4
Other Constituents ² /grab or composite	Quarterly	1	4
Discharge Flow ³	Monthly	1	12
Dioxins/grab or composite	Semi-annual	1	2

¹ The effluent sampling station and the upstream receiving water station specified in the NPDES Permit Monitoring and Reporting Program should be used.

² See list in Attachment G, section II.

³ Discharge Flow. Discharge flow should be recorded and reported for each day of sample collection.

II. DIOXIN AND FURAN SAMPLING

Section 3 of the SIP requires that each NPDES discharger conduct sampling and analysis of dioxin and dibenzofuran congeners.

- A. The required number and frequency of sampling are once during dry weather and once during wet weather for one year, for a total of two samples.
- B. Each sample shall be analyzed for the seventeen congeners listed in the table below. High Resolution GCMS Method 8290, or another method capable of individually quantifying the congeners to an equivalent detection level, shall be used for the analyses.
- C. Sampling shall start during winter 2006/2007 and all analyses shall be completed and submitted by **30 November 2007**. Sample results shall be submitted along with routine monitoring reports as soon as the laboratory results are available.
- D. For each sample the discharger shall report:
 1. The measured or estimated concentration of each of the seventeen congeners
 2. The quantifiable limit of the test (as determined by procedures in Section 2.4.3, No. 5 of the SIP)
 3. The Method Detection Level (MDL) for the test
 4. The TCDD equivalent concentration for each analysis calculated by multiplying the concentration of each congener by the Toxicity Equivalency Factor (TEF) in the following table, and summing the resultant products to determine the equivalent toxicity of the sample expressed as 2,3,7,8-TCDD.

Congener	TEF	Congener	TEF
2,3,7,8-TetraCDD	1	2,3,4,7,8-PentaCDF	0.5
1,2,3,7,8-PentaCDD	1.0	1,2,3,4,7,8-HexaCDF	0.1
1,2,3,4,7,8-HexaCDD	0.1	1,2,3,6,7,8-HexaCDF	0.1
1,2,3,6,7,8-HexaCDD	0.1	1,2,3,7,8,9-HexaCDF	0.1
1,2,3,7,8,9-HexaCDD	0.1	2,3,4,6,7,8-HexaCDF	0.1
1,2,3,4,6,7,8-HeptaCDD	0.01	1,2,3,4,6,7,8-HeptaCDF	0.01
OctaCDD	0.0001	1,2,3,4,7,8,9-HeptaCDF	0.01
2,3,7,8-TetraCDF	0.1	OctaCDF	0.0001
1,2,3,7,8-PentaCDF	0.05		

III. REPORTING REQUIREMENTS

- A. Laboratory Requirements.** The laboratory analyzing the monitoring samples shall be certified by the Department of Health Services in accordance with the provisions of Water Code Section 13176 and must include quality assurance/quality control data with their reports.
- B. Criterion Quantitation Limit (CQL).** The criterion quantitation limits will be equal to or lower than the minimum levels (MLs) in Appendix 4 of the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (Copies of the SIP may be obtained from the State Water Resources Control Board, or downloaded from <http://www.waterboards.ca.gov/iswp/index.html>) or the detection limits for purposes of reporting (DLRs) published by the Department of Health Services (<http://www.dhs.ca.gov/ps/ddwem/chemicals/DLR/dlrintdex.htm>) which is below the controlling water quality criterion concentrations summarized in Attachment G, section II of this Order.
- C. Method Detection Limit (MDL).** The method detection limit for the laboratory shall be determined by the procedure found in 40 Code of Federal Regulations (CFR) Part 136, Appendix B (revised as of 14 May 1999).
- D. Reporting Limit (RL).** The reporting limit for the laboratory. This is the lowest quantifiable concentration that the laboratory can determine. Ideally, the RL should be equal to or lower than the CQL to meet the purposes of this monitoring.
- E. Reporting Protocols.** The results of analytical determinations for the presence of chemical constituents in a sample shall use the following reporting protocols:
1. Sample results greater than or equal to the reported RL shall be reported as measured by the laboratory (*i.e.*, the measured chemical concentration in the sample).
 2. Sample results less than the report RL, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.
 3. For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory, if such information is available, may include numerical estimates of the data quantity for the reported result. Numerical estimates of data quality may be percent accuracy (\pm a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.
 4. Sample results that are less than the laboratory's MDL shall be reported as "Not Detected" or ND.

F. Data Format. The monitoring report shall contain the following information for each pollutant:

1. The name of the constituent.
2. Sampling location.
3. The date the sample was collected.
4. The time the sample was collected.
5. The date the sample was analyzed. For organic analyses, the extraction date will also be indicated to assure that hold times are not exceeded for prepared samples.
6. The analytical method utilized.
7. The measured or estimated concentration.
8. The required Criterion Quantitation Limit (CQL).
9. The laboratory's current Method Detection Limit (MDL), as determined by the procedure found in 40 CFR Part 136, Appendix B (revised as of 14 May 1999).
10. The laboratory's lowest reporting limit (RL).
11. Any additional comments.

IV. CONSTITUENTS TO BE MONITORED

CTR #	Constituent	CAS Number	Controlling Water Quality Criterion for Surface Waters		Suggested Test Methods	
			Basis	Criterion Concentration (ug/L or noted) (1)		
VOLATILE ORGANICS						
28	1,1-Dichloroethane	75343	Primary MCL	5	1	EPA 8260B
30	1,1-Dichloroethene	75354	National Toxics Rule	0.057	0.5	EPA 8260B
41	1,1,1-Trichloroethane	71556	Primary MCL	200	2	EPA 8260B
42	1,1,2-Trichloroethane	79005	National Toxics Rule	0.6	0.5	EPA 8260B
37	1,1,2,2-Tetrachloroethane	79345	National Toxics Rule	0.17	0.5	EPA 8260B
75	1,2-Dichlorobenzene	95501	Taste & Odor	10	2	EPA 8260B
29	1,2-Dichloroethane	107062	National Toxics Rule	0.38	0.5	EPA 8260B
	cis-1,2-Dichloroethene	156592	Primary MCL	6	0.5	EPA 8260B
31	1,2-Dichloropropane	78875	Calif. Toxics Rule	0.52	0.5	EPA 8260B
101	1,2,4-Trichlorobenzene	120821	Public Health Goal	5	5	EPA 8260B
76	1,3-Dichlorobenzene	541731	Taste & Odor	10	2	EPA 8260B
32	1,3-Dichloropropene	542756	Primary MCL	0.5	0.5	EPA 8260B
77	1,4-Dichlorobenzene	106467	Primary MCL	5	2	EPA 8260B
17	Acrolein	107028	Aquatic Toxicity	21	5	EPA 8260B
18	Acrylonitrile	107131	National Toxics Rule	0.059	2	EPA 8260B
19	Benzene	71432	Primary MCL	1	0.5	EPA 8260B
20	Bromoform	75252	Calif. Toxics Rule	4.3	2	EPA 8260B
34	Bromomethane	74839	Calif. Toxics Rule	48	2	EPA 8260B
21	Carbon tetrachloride	56235	National Toxics Rule	0.25	0.5	EPA 8260B
22	Chlorobenzene (mono chlorobenzene)	108907	Taste & Odor	50	2	EPA 8260B
24	Chloroethane	75003	Taste & Odor	16	2	EPA 8260B
25	2- Chloroethyl vinyl ether	110758	Aquatic Toxicity	122 (3)	1	EPA 8260B
26	Chloroform	67663	OEHHA Cancer Risk	1.1	0.5	EPA 8260B
35	Chloromethane	74873	USEPA Health Advisory	3	2.0	EPA 8260B
23	Dibromochloromethane	124481	Calif. Toxics Rule	0.41	0.5	EPA 8260B
27	Dichlorobromomethane	75274	Calif. Toxics Rule	0.56	0.5	EPA 8260B
36	Dichloromethane	75092	Calif. Toxics Rule	4.7	2	EPA 8260B
33	Ethylbenzene	100414	Taste & Odor	29	2	EPA 8260B
88	Hexachlorobenzene	118741	Calif. Toxics Rule	0.00075	1	EPA 8260B
89	Hexachlorobutadiene	87683	National Toxics Rule	0.44	1	EPA 8260B
91	Hexachloroethane	67721	National Toxics Rule	1.9	1	EPA 8260B
94	Naphthalene	91203	USEPA IRIS	14	10	EPA 8260B
38	Tetrachloroethene	127184	National Toxics Rule	0.8	0.5	EPA 8260B
39	Toluene	108883	Taste & Odor	42	2	EPA 8260B
40	trans-1,2-Dichloroethylene	156605	Primary MCL	10	1	EPA 8260B
43	Trichloroethene	79016	National Toxics Rule	2.7	2	EPA 8260B
44	Vinyl chloride	75014	Primary MCL	0.5	0.5	EPA 8260B
	Methyl-tert-butyl ether (MTBE)	1634044	Secondary MCL	5	3	EPA 8260B
	Trichlorofluoromethane	75694	Primary MCL	150	5	EPA 8260B
	1,1,2-Trichloro-1,2,2-Trifluoroethane	76131	Primary MCL	1200	10	EPA 8260B
	Styrene	100425	Taste & Odor	11	0.5	EPA 8260B
	Xylenes	1330207	Taste & Odor	17	0.5	EPA 8260B

CTR #	Constituent	CAS Number	Controlling Water Quality Criterion for Surface Waters		Suggested Test Methods
			Basis	Criterion Concentration (ug/L or noted) (1)	
SEMI-VOLATILE ORGANICS					
60	1,2-Benzanthracene	56553	Calif. Toxics Rule	0.0044	5 EPA 8270C
85	1,2-Diphenylhydrazine	122667	National Toxics Rule	0.04	1 EPA 8270C
45	2-Chlorophenol	95578	Taste and Odor	0.1	2 EPA 8270C
46	2,4-Dichlorophenol	120832	Taste and Odor	0.3	1 EPA 8270C
47	2,4-Dimethylphenol	105679	Calif. Toxics Rule	540	2 EPA 8270C
49	2,4-Dinitrophenol	51285	National Toxics Rule	70	5 EPA 8270C
82	2,4-Dinitrotoluene	121142	National Toxics Rule	0.11	5 EPA 8270C
55	2,4,6-Trichlorophenol	88062	Taste and Odor	2	10 EPA 8270C
83	2,6-Dinitrotoluene	606202	USEPA IRIS	0.05	5 EPA 8270C
50	2-Nitrophenol	25154557	Aquatic Toxicity	150 (5)	10 EPA 8270C
71	2-Chloronaphthalene	91587	Aquatic Toxicity	1600 (6)	10 EPA 8270C
78	3,3'-Dichlorobenzidine	91941	National Toxics Rule	0.04	5 EPA 8270C
62	3,4-Benzofluoranthene	205992	Calif. Toxics Rule	0.0044	10 EPA 8270C
52	4-Chloro-3-methylphenol	59507	Aquatic Toxicity	30	5 EPA 8270C
48	4,6-Dinitro-2-methylphenol	534521	National Toxics Rule	13.4	10 EPA 8270C
51	4-Nitrophenol	100027	USEPA Health Advisory	60	10 EPA 8270C
69	4-Bromophenyl phenyl ether	101553	Aquatic Toxicity	122	10 EPA 8270C
72	4-Chlorophenyl phenyl ether	7005723	Aquatic Toxicity	122 (3)	5 EPA 8270C
56	Acenaphthene	83329	Taste and Odor	20	1 EPA 8270C
57	Acenaphthylene	208968	No Criteria Available		10 EPA 8270C
58	Anthracene	120127	Calif. Toxics Rule	9,600	10 EPA 8270C
59	Benzidine	92875	National Toxics Rule	0.00012	5 EPA 8270C
61	Benzo(a)pyrene (3,4-Benzopyrene)	50328	Calif. Toxics Rule	0.0044	2 EPA 8270C
63	Benzo(g,h,i)perylene	191242	No Criteria Available		5 EPA 8270C
64	Benzo(k)fluoranthene	207089	Calif. Toxics Rule	0.0044	2 EPA 8270C
65	Bis(2-chloroethoxy) methane	111911	No Criteria Available		5 EPA 8270C
66	Bis(2-chloroethyl) ether	111444	National Toxics Rule	0.031	1 EPA 8270C
67	Bis(2-chloroisopropyl) ether	39638329	Aquatic Toxicity	122 (3)	10 EPA 8270C
68	Bis(2-ethylhexyl) phthalate	117817	National Toxics Rule	1.8	5 EPA 8270C
70	Butyl benzyl phthalate	85687	Aquatic Toxicity	3 (7)	10 EPA 8270C
73	Chrysene	218019	Calif. Toxics Rule	0.0044	5 EPA 8270C
81	Di-n-butylphthalate	84742	Aquatic Toxicity	3 (7)	10 EPA 8270C
84	Di-n-octylphthalate	117840	Aquatic Toxicity	3 (7)	10 EPA 8270C
74	Dibenzo(a,h)-anthracene	53703	Calif. Toxics Rule	0.0044	0.1 EPA 8270C
79	Diethyl phthalate	84662	Aquatic Toxicity	3 (7)	2 EPA 8270C
80	Dimethyl phthalate	131113	Aquatic Toxicity	3 (7)	2 EPA 8270C
86	Fluoranthene	206440	Calif. Toxics Rule	300	10 EPA 8270C
87	Fluorene	86737	Calif. Toxics Rule	1300	10 EPA 8270C
90	Hexachlorocyclopentadiene	77474	Taste and Odor	1	5 EPA 8270C
92	Indeno(1,2,3-c,d)pyrene	193395	Calif. Toxics Rule	0.0044	0.05 EPA 8270C
93	Isophorone	78591	National Toxics Rule	8.4	1 EPA 8270C
98	N-Nitrosodiphenylamine	86306	National Toxics Rule	5	1 EPA 8270C
96	N-Nitrosodimethylamine	62759	National Toxics Rule	0.00069	5 EPA 8270C
97	N-Nitrosodi-n-propylamine	621647	Calif. Toxics Rule	0.005	5 EPA 8270C
95	Nitrobenzene	98953	National Toxics Rule	17	10 EPA 8270C
53	Pentachlorophenol	87865	Calif. Toxics Rule	0.28	1 EPA 8270C
99	Phenanthrene	85018	No Criteria Available		5 EPA 8270C
54	Phenol	108952	Taste and Odor	5	1 EPA 8270C
100	Pyrene	129000	Calif. Toxics Rule	960	10 EPA 8270C

INORGANICS

CTR #	Constituent	CAS Number	Controlling Water Quality Criterion for Surface Waters			
			Basis	Criterion Concentration (ug/L or noted) (1)	Criterion Quantitation Limit (ug/L or noted)	Suggested Test Methods
	Aluminum	7429905	Ambient Water Quality	87	50	EPA 6020/200.8
1	Antimony	7440360	Primary MCL	6	5	EPA 6020/200.8
2	Arsenic	7440382	Ambient Water Quality	0.018	1	EPA 6020/Hydride
15	Asbestos	1332214	National Toxics Rule/ Primary MCL	7 MFL	0.2 MFL >10um	EPA/600/R-93/116(PCM)
	Barium	7440393	Basin Plan Objective	100	100	EPA 6020/200.8
3	Beryllium	7440417	Primary MCL	4	1	EPA 6020/200.8
4	Cadmium	7440439	Public Health Goal	0.07	0.25	EPA 1638/200.8
5a	Chromium (total)	7440473	Primary MCL	50	2	EPA 6020/200.8
5b	Chromium (VI)	18540299	Public Health Goal	0.2	5	EPA 7199/1636
6	Copper	7440508	National Toxics Rule	4.1 (2)	0.5	EPA 6020/200.8
14	Cyanide	57125	National Toxics Rule	5.2	5	EPA 9012A
	Fluoride	7782414	Public Health Goal	1000	100	EPA 300
	Iron	7439896	Secondary MCL	300	100	EPA 6020/200.8
7	Lead	7439921	Calif. Toxics Rule	0.92 (2)	0.5	EPA 1638
8	Mercury	7439976	TMDL Development		0.0005 (11)	EPA 1669/1631
	Methylmercury	22967926	TMDL Development		0.00002 (11)	EPA 1669/1630/1631
	Manganese	7439965	Secondary MCL/ Basin Plan Objective	50	20	EPA 6020/200.8
9	Nickel	7440020	Calif. Toxics Rule	24 (2)	5	EPA 6020/200.8
10	Selenium	7782492	Calif. Toxics Rule	5 (8)	5	EPA 6020/200.8
11	Silver	7440224	Calif. Toxics Rule	0.71 (2)	1	EPA 6020/200.8
12	Thallium	7440280	National Toxics Rule	1.7	1	EPA 6020/200.8
	Tributyltin	688733	Ambient Water Quality	0.063	0.06	EV-024/025
13	Zinc	7440666	Calif. Toxics Rule/ Basin Plan Objective	54/ 16 (2)	10	EPA 6020/200.8
PESTICIDES - PCBs						
110	4,4'-DDD	72548	Calif. Toxics Rule	0.00083	0.05	EPA 8081A
109	4,4'-DDE	72559	Calif. Toxics Rule	0.00059	0.05	EPA 8081A
108	4,4'-DDT	50293	Calif. Toxics Rule	0.00059	0.01	EPA 8081A
112	alpha-Endosulfan	959988	National Toxics Rule	0.056 (9)	0.02	EPA 8081A
103	alpha-Hexachlorocyclohexane (BHC)	319846	Calif. Toxics Rule	0.0039	0.01	EPA 8081A
	Alachlor	15972608	Primary MCL	2	1	EPA 8081A
102	Aldrin	309002	Calif. Toxics Rule	0.00013	0.005	EPA 8081A
113	beta-Endosulfan	33213659	Calif. Toxics Rule	0.056 (9)	0.01	EPA 8081A
104	beta-Hexachlorocyclohexane	319857	Calif. Toxics Rule	0.014	0.005	EPA 8081A
107	Chlordane	57749	Calif. Toxics Rule	0.00057	0.1	EPA 8081A
106	delta-Hexachlorocyclohexane	319868	No Criteria Available		0.005	EPA 8081A
111	Dieldrin	60571	Calif. Toxics Rule	0.00014	0.01	EPA 8081A
114	Endosulfan sulfate	1031078	Ambient Water Quality	0.056	0.05	EPA 8081A
115	Endrin	72208	Calif. Toxics Rule	0.036	0.01	EPA 8081A
116	Endrin Aldehyde	7421934	Calif. Toxics Rule	0.76	0.01	EPA 8081A
117	Heptachlor	76448	Calif. Toxics Rule	0.00021	0.01	EPA 8081A
118	Heptachlor Epoxide	1024573	Calif. Toxics Rule	0.0001	0.01	EPA 8081A
105	Lindane (gamma-Hexachlorocyclohexane)	58899	Calif. Toxics Rule	0.019	0.02	EPA 8081A
119	PCB-1016	12674112	Calif. Toxics Rule	0.00017 (10)	0.5	EPA 8082
120	PCB-1221	11104282	Calif. Toxics Rule	0.00017 (10)	0.5	EPA 8082
121	PCB-1232	11141165	Calif. Toxics Rule	0.00017 (10)	0.5	EPA 8082

CTR #	Constituent	CAS Number	Controlling Water Quality Criterion for Surface Waters		Suggested Test Methods	
			Basis	Criterion Concentration (ug/L or noted) (1)		
122	PCB-1242	53469219	Calif. Toxics Rule	0.00017 (10)	0.5	EPA 8082
123	PCB-1248	12672296	Calif. Toxics Rule	0.00017 (10)	0.5	EPA 8082
124	PCB-1254	11097691	Calif. Toxics Rule	0.00017 (10)	0.5	EPA 8082
125	PCB-1260	11096825	Calif. Toxics Rule	0.00017 (10)	0.5	EPA 8082
126	Toxaphene	8001352	Calif. Toxics Rule	0.0002	0.5	EPA 8081A
	Atrazine	1912249	Public Health Goal	0.15	1	EPA 8141A
	Bentazon	25057890	Primary MCL	18	2	EPA 643/ 515.2
	Carbofuran	1563662	CDFG Hazard Assess.	0.5	5	EPA 8318
	2,4-D	94757	Primary MCL	70	10	EPA 8151A
	Dalapon	75990	Ambient Water Quality	110	10	EPA 8151A
	1,2-Dibromo-3-chloropropane (DBCP)	96128	Public Health Goal	0.0017	0.01	EPA 8260B
	Di(2-ethylhexyl)adipate	103231	USEPA IRIS	30	5	EPA 8270C
	Dinoseb	88857	Primary MCL	7	2	EPA 8151A
	Diquat	85007	Ambient Water Quality	0.5	4	EPA 8340/ 549.1/HPLC
	Endothal	145733	Primary MCL	100	45	EPA 548.1
	Ethylene Dibromide	106934	OEHHA Cancer Risk	0.0097	0.02	EPA 8260B/ 504
	Glyphosate	1071836	Primary MCL	700	25	HPLC/ EPA 547
	Methoxychlor	72435	Public Health Goal	30	10	EPA 8081A
	Molinate (Ordram)	2212671	CDFG Hazard Assess.	13	2	EPA 634
	Oxamyl	23135220	Public Health Goal	50	20	EPA 8318/ 632
	Picloram	1918021	Primary MCL	500	1	EPA 8151A
	Simazine (Princep)	122349	USEPA IRIS	3.4	4	EPA 8141A
	Thiobencarb	28249776	Basin Plan Objective/ Secondary MCL	1	1	HPLC/ EPA 639
16	2,3,7,8-TCDD (Dioxin)	1746016	Calif. Toxics Rule	1.30E-08	5.00E-06	EPA 8290 (HRGC) MS
	2,4,5-TP (Silvex)	93765	Ambient Water Quality	10	1	EPA 8151A

CTR #	Constituent	CAS Number	Controlling Water Quality Criterion for Surface Waters		Suggested Test Methods
			Basis	Criterion Concentration (ug/L or noted) (1)	
OTHER CONSTITUENTS					
	Ammonia (as N)	7664417	Ambient Water Quality	1500 (4)	EPA 350.1
	Chloride	16887006	Agricultural Use	106,000	EPA 300.0
	Flow			1 CFS	
	Hardness (as CaCO ₃)			5000	EPA 130.2
	Foaming Agents (MBAS)		Secondary MCL	500	SM5540C
	Nitrate (as N)	14797558	Primary MCL	10,000	2,000 EPA 300.0
	Nitrite (as N)	14797650	Primary MCL	1000	400 EPA 300.0
	pH		Basin Plan Objective	6.5-8.5	0.1 EPA 150.1
	Phosphorus, Total (as P)	7723140	USEPA IRIS	0.14	EPA 365.3
	Specific conductance (EC)		Agricultural Use	700 umhos/cm	EPA 120.1
	Sulfate		Secondary MCL	250,000	500 EPA 300.0
	Sulfide (as S)		Taste and Odor	0.029	EPA 376.2
	Sulfite (as SO ₃)		No Criteria Available		SM4500-SO3
	Temperature		Basin Plan Objective	°F	
	Total Dissolved Solids (TDS)		Agricultural Use	450,000	EPA 160.1

FOOTNOTES:

- (1) - The Criterion Concentrations serve only as a point of reference for the selection of the appropriate analytical method. They do not indicate a regulatory decision that the cited concentration is either necessary or sufficient for full protection of beneficial uses. Available technology may require that effluent limits be set lower than these values.
- (2) - Freshwater aquatic life criteria for metals are expressed as a function of total hardness (mg/L) in the water body. Values displayed correspond to a total hardness of 40 mg/L.
- (3) - For haloethers
- (4) - Freshwater aquatic life criteria for ammonia are expressed as a function of pH and temperature of the water body. Values displayed correspond to pH 8.0 and temperature of 22 C.
- (5) - For nitrophenols.
- (6) - For chlorinated naphthalenes.
- (7) - For phthalate esters.
- (8) - Basin Plan objective = 2 ug/L for Salt Slough and specific constructed channels in the Grassland watershed.
- (9) - Criteria for sum of alpha- and beta- forms.
- (10) - Criteria for sum of all PCBs.
- (11) - Mercury monitoring shall utilize "ultra-clean" sampling and analytical methods. These methods include: Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels, US EPA; and Method 1631: Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence, US EPA