

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION**

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**ORDER R5-2017-0086
NPDES NO. CA0085332**

**WASTE DISCHARGE REQUIREMENTS FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF PARKS AND RECREATION
MALAKOFF DIGGINS STATE HISTORIC PARK
NEVADA COUNTY**

The following Discharger is subject to waste discharge requirements (WDR's) set forth in this Order:

Table 1. Discharger Information

Discharger	State of California, Department of Parks and Recreation
Name of Facility	Malakoff Diggins State Historic Park
Facility Address	23579 North Bloomfield Road
	Nevada City, 95959
	Nevada County

Table 2. Discharge Locations

Discharge Points	Effluent Description	Discharge Point Latitude (North)	Discharge Point Longitude (West)	Receiving Water
001	Mining Waste	39° 22' 3.2" N	120° 55' 17.2" W	Humbug Creek

Table 3. Administrative Information

This Order was adopted on:	11 August 2017
This Order shall become effective on:	1 October 2017
This Order shall expire on:	30 September 2022
The Discharger shall file a Report of Waste Discharge as an application for reissuance of WDR's in accordance with title 23, California Code of Regulations, and an application for reissuance of a National Pollutant Discharge Elimination System (NPDES) permit no later than:	30 September 2021
The U.S. Environmental Protection Agency (U.S. EPA) and the California Regional Water Quality Control Board, Central Valley Region have classified this discharge as follows:	Minor Discharge

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of the Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on **11 August 2017**.

Original signed by

PAMELA C. CREEDON, Executive Officer

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I. FACILITY INFORMATION

Information describing Malakoff Diggins State Historic Park (Park) and hydraulic mine pit (Pit) are summarized in Table 1 and in sections I and II of the Fact Sheet (Attachment F). Section I of the Fact Sheet also includes information regarding the Discharger's permit application.

As of August 2017, there is no facility to treat and/or control the wastewater generated at the Pit prior to discharge into Humbug Creek. During the term of this Order, facilities are to begin construction.

II. FINDINGS

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

- A. Legal Authorities.** This Order serves as WDR's pursuant to article 4, chapter 4, division 7 of the California Water Code (commencing with section 13260). This Order is also issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. EPA and chapter 5.5, division 7 of the Water Code (commencing with section 13370). It shall serve as an NPDES permit for point source discharges from this facility to surface waters.
- B. Background and Rationale for Requirements.** The Central Valley Water Board developed the requirements in this Order based on information submitted as part of the application, through monitoring and reporting programs, and other available information. The Fact Sheet (Attachment F), which contains background information and rationale for the requirements in this Order, is hereby incorporated into and constitutes Findings for this Order. Attachments A through E and G through H are also incorporated into this Order.
- C. Provisions and Requirements Implementing State Law.** The provisions/requirements in subsections IV.D and IV.E are included to implement state law only. These provisions/requirements are not required or authorized under the federal CWA; consequently, violations of these provisions/requirements are not subject to the enforcement remedies that are available for NPDES violations.
- D. Monitoring and Reporting.** 40 C.F.R. section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorize the Central Valley 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 in Attachment E.

The technical and monitoring reports in this Order are required in accordance with Water Code section 13267, which states the following in subsection (b)(1), *"In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports."*

The State of California, Department of Parks and Recreation (Discharger) owns and operates the Pit discharge subject to this Order. The monitoring reports required by this Order are necessary to determine compliance with this Order. The need for the monitoring reports is discussed in the Fact Sheet.

- E. Notification of Interested Parties.** The Central Valley Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe WDR's for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of the notification are provided in the Fact Sheet.
- F. Consideration of Public Comment.** The Central Valley 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.

THEREFORE, IT IS HEREBY ORDERED that in order to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations adopted thereunder and the provisions of the CWA and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

III. DISCHARGE PROHIBITIONS

- A.** Discharge of wastewater from the Pit, as the Pit is specifically described in the Fact Sheet in section II.B, in a manner different from that described in this Order is prohibited.
- B.** The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Federal Standard Provisions I.G. and I.H. (Attachment D).
- C.** Neither the discharge nor its treatment shall create a nuisance as defined in section 13050 of the Water Code.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations – Discharge Point 001

1. Final Effluent Limitations – Discharge Point 001

The Discharger shall maintain compliance with the following effluent limitations at Discharge Point 001, with compliance measured at Monitoring Location EFF-001 as described in the Monitoring and Reporting Program, Attachment E:

- a. The Discharger shall maintain compliance with the effluent limitations specified in Table 4 at EFF-001:

Table 4. Effluent Limitations for EFF-001

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Copper, Total Recoverable	µg/L	0.92	--	2.5	--	--
Manganese, Total Recoverable	µg/L	87	200	--	--	--
Mercury, Total Recoverable	µg/L	0.05	--	0.14	--	--
Nickel, Total Recoverable	µg/L	8.6	--	19	--	--
pH	Standard Units	--	--	--	6.5	8.5

- b. **Acute Whole Effluent Toxicity.** Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:
 - i. 70%, minimum for any one bioassay; and
 - ii. 90%, median for any three consecutive bioassays.

2. Interim Effluent Limitations – Discharge Point 001

- a. During the period beginning 1 October 2017 and ending on 30 September 2027, the Discharger shall maintain compliance with the following limitations at Discharge Point 001, with compliance measured at Monitoring Location EFF-001 as described in the attached MRP. 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.

Table 5. Interim Effluent Limitations for EFF-001

Parameter	Units	Min/Max Effluent Conc	Effluent Limitations				
			Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Manganese, Total Recoverable	µg/L	1400 max	2000	5000	--	--	--
pH	Standard Units	5.9 - 9.3	--	--	--	5.4	9.8

B. Land Discharge Specifications – Not Applicable

C. Recycling Specifications – Not Applicable

V. RECEIVING WATER LIMITATIONS

A. Surface Water Limitations

The discharge at Discharge Point 001 shall not cause the following in Humbug Creek:

- 1. **Chemical Constituents.** Chemical constituents to be present in concentrations that adversely affect beneficial uses.
- 2. **Color.** Discoloration that causes nuisance or adversely affects beneficial uses.
- 3. **Dissolved Oxygen:**
 - a. The 95 percentile dissolved oxygen concentration to fall below 75 percent of saturation; nor
 - b. The dissolved oxygen concentration to be reduced below 7.0 mg/L at any time.

For Discharge Point 001, receiving water monitoring data, measured at monitoring locations RSW-001 and RSW-002, will be used to determine compliance with part “b” of the dissolved oxygen receiving water limitation to ensure the discharge does not cause the dissolved oxygen concentrations in Humbug Creek to be reduced below 7.0 mg/L at any time.

- 4. **Floating Material.** Floating material to be present in amounts that cause nuisance or adversely affect beneficial uses.

5. **Oil and Grease.** 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.
6. **pH.** The pH to be depressed below 6.5 nor raised above 8.5.
7. **Settleable Substances.** Substances to be present in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.
8. **Suspended Material.** Suspended material to be present in concentrations that cause nuisance or adversely affect beneficial uses.
9. **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.
10. **Taste and Odors.** 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.
11. **Temperature.** The temperature of Humbug Creek to be increased by more than 5°F.
Compliance for Discharge Point 001 to be determined based on the difference in temperature at Monitoring Locations RSW-001 and RSW-002.
12. **Toxicity.** Toxic substances to be present, individually or in combination, in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.
13. **Turbidity:**
 - a. Shall not exceed 2 Nephelometric Turbidity Units (NTU) where natural turbidity at RSW-001 is less than 1 NTU;
 - b. Shall not increase more than 1 NTU where natural turbidity at RSW-001 is between 1 and 5 NTUs;
 - c. Shall not increase more than 20 percent where natural turbidity at RSW-001 is between 5 and 50 NTUs;
 - d. Shall not increase more than 10 NTU where natural turbidity at RSW-001 is between 50 and 100 NTUs; nor
 - e. Shall not increase more than 10 percent where natural turbidity at RSW-001 is greater than 100 NTUs.

B. Groundwater Limitations – Not Applicable

VI. PROVISIONS

A. Standard Provisions

1. The Discharger shall comply with all Standard Provisions included in Attachment D.
2. The Discharger shall comply with the following provisions. In the event that there is any conflict, duplication, or overlap between provisions specified by this Order, the more stringent provision shall apply:
 - 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 CWA, 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. *Land application plans.* When required by a permit condition to incorporate a land application plan for beneficial reuse of sewage sludge, to revise an existing land application plan, or to add a land application plan.
- iii. *Change in sludge use or disposal practice.* Under 40 CFR section 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 Central Valley Water Board may review and revise this Order at any time upon application of any affected person or the Central Valley Water 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 Central Valley 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 yet been modified.

- c. 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.

- d. 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.
- e. 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 sludge use 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.

- f. The Discharger shall ensure compliance with any existing or future pretreatment standard promulgated by USEPA under section 307 of the CWA, or amendment thereto, for any discharge to the municipal system.
- g. 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.
- h. 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 Central Valley 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 5 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 Central Valley Water Board.
- i. The Discharger, upon written request of the Central Valley 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 the Central Valley Water Board Standard Provision contained in section VI.A.2.i of this Order.

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 Central Valley 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.

- j. The Discharger shall submit technical reports as directed by the Executive Officer. 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.

- k. The Central Valley Water Board is authorized to enforce the terms of this permit under several provisions of the Water Code, including, but not limited to, sections 13385, 13386, and 13387.
- l. 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 the Central Valley Water Board.

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 Central Valley Water Board and a statement. The statement shall comply with the signatory and certification requirements in the federal Standard Provisions (Attachment D, section 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 Water Code. Transfer shall be approved or disapproved in writing by the Executive Officer.

- p. Failure to comply with provisions or requirements of this Order, or violation of other applicable laws or regulations governing discharges from this facility, may subject the Discharger to administrative or civil liabilities, criminal penalties, and/or other enforcement remedies to ensure compliance. Additionally, certain violations may subject the Discharger to civil or criminal enforcement from appropriate local, state, or federal law enforcement entities.
- q. In the event the Discharger does not comply or will be unable to comply for any reason, with any prohibition, average monthly effluent limitation, average weekly effluent limitation, maximum daily effluent limitation, instantaneous minimum effluent limitation, or instantaneous maximum effluent limitation, or receiving water limitation of this Order, the Discharger shall notify the Central Valley 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 Central Valley Water Board waives confirmation. The written notification shall state the nature, time, duration, and cause of noncompliance, and shall describe the measures being taken to remedy the current noncompliance and prevent recurrence including, where applicable, a schedule of implementation. Other noncompliance requires written notification as above at the time of the normal monitoring report.

B. Monitoring and Reporting Program (MRP) Requirements

The Discharger shall comply with the MRP in Attachment E, and future revisions thereto.

C. Special Provisions

1. Reopener Provisions

- a. Conditions that necessitate a major modification of a permit are described in 40 CFR section 122.62, including, but not limited to:

- i. If new or amended applicable water quality standards are promulgated or approved pursuant to section 303 of the CWA, or amendments thereto, this permit may be reopened and modified in accordance with the new or amended standards.
 - ii. When new information, that was not available at the time of permit issuance, would have justified different permit conditions at the time of issuance.
- b. **Flow.** This provision allows the Central Valley Water Board to reopen this Order if the Central Valley Water Board determines that a treatment and/or control facility has been constructed and operational specifications for flow are warranted.
- c. **Hardness-Dependent Metals.** This provision allows the Central Valley Water Board to reopen this Order for the hardness-dependent metals, chromium III, copper, and zinc, to establish additional or modified effluent limitations as follows:
 - i. **Copper**
 - (a) Water Effects Ratio (WER) and Metal Translators. A default WER of 1.0 has been used in this Order for calculating criteria for copper. In addition, a default dissolved-to-total metal translator has been used to convert water quality objectives from dissolved to total recoverable when developing effluent limitations for copper. If the Discharger performs studies to determine a site-specific WER and/or site-specific dissolved-to-total metal translator, this Order may be reopened to modify the effluent limitations for copper.
 - (b) If an applicable TMDL program for copper is adopted.
 - ii. **Chromium III or Zinc**
 - (a) If applicable TMDL programs for chromium or zinc are adopted.
- d. **Mercury.** This provision allows the Central Valley Water Board to reopen this Order if the Central Valley Water Board determines that a mercury offset program is feasible for dischargers subject to NPDES permits. In addition, this Order may be reopened to establish additional or modified effluent limitations for mercury as follows:
 - i. If the Statewide Mercury Program is adopted with new Water Quality Objectives for mercury;
 - ii. If TMDLs for mercury are developed for Humbug Creek; and
 - iii. If Waste Load Allocations (WLAs) are established for mercury that include allocations for Malakoff Diggins.
- e. **Iron or Total Chromium.** This provision allows the Central Valley Water Board to reopen this Order for iron or total chromium to establish additional or modified effluent limitations
 - i. if applicable TMDLs for iron or chromium are developed.
- f. **pH.** This provision allows the Central Valley Water Board to reopen this Order for pH to establish additional or modified effluent limitations if applicable TMDLs for pH are developed.
- g. **Sediment/Siltation.** This provision allows the Central Valley Water Board to reopen this Order if applicable WLAs for sediment/siltation are developed.

- h. **Turbidity.** This provision allows the Central Valley Water Board to reopen this Order if the Central Valley Water Board determines that a treatment and/or control facility has been constructed and turbidity operation specifications are warranted.
 - i. **Whole Effluent Toxicity.** As a result of a Toxicity Reduction Evaluation (TRE), this Order may be reopened to include a numeric or narrative chronic toxicity limitation, a new acute toxicity limitation, and/or a limitation for a specific toxicant identified in the TRE. Additionally, if the State Water Board revises the SIP's toxicity control provisions that would require the establishment of numeric chronic toxicity effluent limitations, this Order may be reopened to include a numeric chronic toxicity effluent limitation based on the new provisions.
 - j. **Treatment System Flow Schematic.** If a treatment or control facility is installed during the term of this Order, the Central Valley Water Board may reopen this Order to include a flow schematic in Attachment C.
- 2. Special Studies, Technical Reports and Additional Monitoring Requirements**
- a. **Toxicity Reduction Evaluation Requirements.** For compliance with the Basin Plan's narrative toxicity objective, this Order requires the Discharger to conduct chronic whole effluent toxicity (WET) testing on the discharge at EFF-001, as specified in the MRP section V. Furthermore, this Provision requires the Discharger to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity. If the discharge exceeds the numeric toxicity monitoring trigger during accelerated monitoring established in this Provision, the Discharger is required to initiate a Toxicity Reduction Evaluation (TRE) in accordance with an approved Initial Investigative TRE Work Plan and TRE Action Plan, and take actions to mitigate the impact of the discharge and prevent recurrence of toxicity. A TRE is a site-specific study conducted in a stepwise process to identify the source(s) of toxicity and the effective control measures for effluent toxicity. TREs are designed to identify the causative agents and sources of whole effluent toxicity, evaluate the effectiveness of the toxicity control options, and confirm the reduction in effluent toxicity. This Provision includes procedures for accelerated chronic toxicity monitoring and TRE initiation.
 - i. **Initial Investigative TRE Work Plan.** Within 90 days of the effective date of this Order, the Discharger shall submit to the Central Valley Water Board an Initial Investigative TRE Work Plan for approval by the Executive Officer. This should be a one to two page document that includes a description of the investigation and evaluation techniques that will be used to identify potential causes and sources of effluent toxicity and effluent variability and to ensure the discharger has a plan to immediately move forward with the initial tiers of a TRE.
 - ii. **Accelerated Monitoring and TRE Initiation.** When the numeric toxicity monitoring trigger is exceeded during regular chronic toxicity monitoring, and the testing meets all test acceptability criteria, the Discharger shall initiate accelerated monitoring as required in the Accelerated Monitoring Specifications. The Discharger shall initiate a TRE to address effluent toxicity if any WET testing results exceed the numeric toxicity monitoring trigger during accelerated monitoring.
 - iii. **Numeric Toxicity Monitoring Trigger.** The numeric toxicity monitoring trigger to initiate a TRE is 2 samples out of 3 with a $TU_c > 1$ and % effect > 25% (where $TU_c = 100/NOEC$). The monitoring trigger is not an effluent limitation; it is the

toxicity threshold at which the Discharger is required to begin accelerated monitoring and initiate a TRE.

- iv. **Accelerated Monitoring Specifications.** If the numeric toxicity monitoring trigger is exceeded during regular chronic toxicity testing, the Discharger shall initiate accelerated monitoring within 14-days of notification by the laboratory of the exceedance. Accelerated monitoring shall consist of four chronic toxicity tests conducted once every two weeks using the species that exhibited toxicity. The following protocol shall be used for accelerated monitoring and TRE initiation:
 - (a) If the results of four consecutive accelerated monitoring tests do not exceed the monitoring trigger, the Discharger may cease accelerated monitoring and resume regular chronic toxicity monitoring.
 - (b) If the result of any accelerated toxicity test exceeds the monitoring trigger, the Discharger shall cease accelerated monitoring and begin a TRE to investigate the cause(s) of, and identify corrective actions to reduce or eliminate effluent toxicity. Within thirty (30) days of notification by the laboratory of any test result exceeding the monitoring trigger during accelerated monitoring, the Discharger shall submit a TRE Action Plan to the Central Valley Water Board including, at minimum:
 - (1) Any specific actions the Discharger will take to investigate and identify the cause(s) of toxicity;
 - (2) Any specific actions the Discharger will take to mitigate the impact of the discharge and prevent the recurrence of toxicity;
 - (3) An update of the current status of the overall site investigation, assessment of Best Management Practices (BMPs), and/or implementation of BMPs and treatment or control processes; and
 - (4) An up-to-date schedule for these actions.

3. **Best Management Practices as Required in 40 CFR §122.44(k)**

- a. The Central Valley Water Board is authorized under the federal regulations (40 CFR 122.44(k)) to impose Best Management Practices (BMPs) to control or abate the discharge of pollutants in lieu of numeric effluent limitations when the Board finds that BMPs are reasonably necessary to achieve effluent limitations and standards, or to carry out the purposes and intent of the federal Clean Water Act and state California Water Code and California Code of Regulations.

The Basin Plan contains several Water Quality Objectives that are applicable to the discharge from the Pit. Discharge from the Pit is in violation of the following Water Quality Objectives:

- i. **Sediment.** The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
- ii. **Settleable Material.** Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.
- iii. **Suspended Material.** Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

- iv. **Turbidity.** Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:
- Where natural turbidity is less than 1 Nephelometric Turbidity Unit (NTU), controllable factors shall not cause downstream turbidity to exceed 2 NTUs.
 - Where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU.
 - Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.
 - Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.
 - Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

This Order contains a turbidity receiving water limitation based on the numeric Basin Plan Water Quality Objective for turbidity. This Order also contains receiving water limitations for sediment, settleable material, and suspended material based on the Water Quality Objectives. Numeric effluent limitations are not feasible for the turbidity, sediment, settleable material, and suspended material Water Quality Objectives. Malakoff Diggins must control erosion and the discharge of sediment to Diggins Creek and Humbug Creek, and downstream waters. The Discharger must also manage runoff from the site. Therefore, the Central Valley Water Board may require BMPs to implement water quality standards.

USEPA has developed a relevant document for assessing applicable BMPs for industrial facilities; *Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices*, 1992.

- b. The Discharger must submit a BMP Options Assessment/Engineering Evaluation, must submit a BMP Plan for approval by the Executive Officer, must submit confirmation of financial resource commitment for the selected BMPs, and must submit a technical report documenting implementation of the selected BMPs. See Table 6 below for the complete BMP task list and associated compliance dates. The BMP requirements are also presented in Time Schedule Order R5-2017-0087. The Discharger shall comply with the following time schedule to complete the BMP options assessment and implementation:

The BMP Options Assessment/Engineering Evaluation must assess, at a minimum, the following BMPs:

- i. Flow Diversion Practices, including but not limited to storm water conveyance, diversion dikes, and graded areas;
- ii. Exposure Minimization Practices, including but not limited to containment diking, curbing, collection basins, sumps, and covering;
- iii. Sediment and Erosion Prevention Practices, including but not limited to preservation of natural vegetation, permanent seeding and planting, interceptor dikes and swales, pipe slope drains, subsurface drains, filter fences, brush and hay bale barriers, berms, sediment traps, sediment basins, check dams, and gradient terraces;

- iv. Infiltration Practices, including but not limited to vegetated filter strips, grassed swales, and infiltration trenches; and
- v. Mitigative Practices, including but not limited to excavation, filtration, and sedimentation basins;
- vi. Other Minimization, Preventive, and Mitigative Practices not listed in this Order;

The Discharger shall develop and implement the BMP Plan to prevent or minimize the generation and discharge of wastes and pollutants to waters of the United States and waters of the State and ensure disposal or land application of wastes is in compliance with applicable solid waste disposal regulations. The Discharger shall review the BMP Plan annually and must amend the BMP Plan whenever there is a change in the facility or in the operation of the facility which materially increases the generation of pollutants or their release or potential release to surface waters. The BMP Plan shall include all BMPs selected for implementation at the facility. Once approved by the Executive Officer, the Discharger shall ensure that its operations staff are familiar with the BMP Plan and have been adequately trained in the specific procedures it requires. See Time Schedule Order R5-2017-0087 for further reference.

4. Construction, Operation, and Maintenance Specifications

- a. **Construction Specifications.** Construction activities shall be conducted in accordance with the BMP Plan approved by the Executive Officer.
- b. **Solids Disposal Specifications.** Collected screenings, sludge, and other solids, 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.

5. Special Provisions for Municipal Facilities (POTW's Only) – Not Applicable

6. Other Special Provisions – Not Applicable

7. Compliance Schedules

- a. **Compliance schedule for implementation of BMPs in the Pit and final effluent limitations for manganese and pH at EFF-001.** This Order requires compliance with the final effluent limitations by 30 September 2027. Implementation of BMPs in the Pit is integral to the control of sediment that is the source of manganese and pH violations, and turbidity in the discharge at EFF-001. Therefore, the BMP implementation schedule is included as a subset in the overall compliance schedule. The Discharger shall comply with the following time schedule to ensure compliance with the final effluent limitations for manganese and pH:

Table 6. EFF-001 Task Schedule and Compliance Dates

Task	Compliance Date
1. Submit all monitoring data from wet season 2016-2017.	1 November 2017
2. Submit a Work Plan for an Engineering Evaluation that includes: <ul style="list-style-type: none"> a. Definition of spoils piles within the Pit; b. Slope Stability Analysis of Pit walls; c. Compilation of GPS coordinates for RSW-001 and RSW-002 d. Pit Assessment (that may include but is not limited to): <ul style="list-style-type: none"> • Detailed Topographic Survey. • Hydrologic Model. 	1 April 2018

<p>3. Submit a Watershed Assessment</p> <ol style="list-style-type: none"> a. Diggins Creek <ul style="list-style-type: none"> • Assess any other sources that may flow into Diggins Creek between Hiller Tunnel and Humbug Creek b. Humbug Creek, upstream of the confluence with Diggins Creek <ul style="list-style-type: none"> • Research additional sources of mercury, hardness-dependent metals, aluminum, iron, and manganese c. Humbug Creek, downstream of the confluence with Diggins Creek to the boundary of the Park <ul style="list-style-type: none"> • Research additional sources of mercury, hardness-dependent metals, aluminum, iron, and manganese, including but not limited to the Shaft 5 discharge to Humbug Creek and the NBT Outlet discharge to Humbug Creek. 	<p>1 October 2018</p>
<p>4. Submit the Engineering Evaluation Report from Task 2.</p>	<p>1 October 2019</p>
<p>5. Submit a BMP Options Assessment/Engineering Evaluation, including but not limited to the following Practices:</p> <ol style="list-style-type: none"> a. Flow Diversion Practices such as storm water conveyance, diversion dikes, and graded areas. b. Exposure Minimization Practices such as containment diking, curbing, collection basins, sumps, and covering. c. Sediment and Erosion Prevention Practices such as preservation of natural vegetation, permanent seeding and planting, interceptor dikes and swales, pipe slope drains, subsurface drains, filter fences, brush and hay bale barriers, berms, sediment traps, sediment basins, check dams, and gradient terraces. d. Infiltration Practices such as vegetated filter strips, grassed swales, and infiltration trenches. e. Mitigation Practices such as excavation, filtration units, and sedimentation basins. f. Other Minimization, Preventive, and Mitigation Practices not listed here. 	<p>1 April 2020</p>
<p>6. Submit a BMP Plan for Executive Officer approval.</p>	<p>1 October 2020</p>
<p>7. Submit confirmation of financial resource commitment for selected BMPs.</p>	<p>1 April 2021</p>
<p>8. Submit a technical report documenting implementation of BMPs.</p>	<p>1 October 2021</p>
<p>9. Submit a technical report assessing mitigation and/or control alternatives and a time schedule for implementation of the selected alternatives:</p> <ul style="list-style-type: none"> • To achieve compliance with final effluent limitations at EFF-001 by 30 September 2027. 	<p>1 April 2022</p>
<p>10. Submit confirmation of financial resource commitment for the selected mitigation and/or control alternatives.</p>	<p>1 April 2023</p>
<p>11. Submit confirmation of start of construction of selected mitigation and/or control alternatives.</p>	<p>1 April 2024</p>
<p>12. Submit a technical report documenting that construction has been completed on the selected mitigation and/or control alternatives.</p>	<p>1 April 2026</p>
<p>13. Submit a technical report documenting full operation of the selected mitigation and/or control alternatives.</p>	<p>1 April 2027</p>
<p>14. Comply with the Final Effluent Limitations at EFF-001 for manganese and pH.</p>	<p>30 September 2027</p>
<p>15. Submit Annual Progress Reports documenting the steps taken to comply with this Order, describing the completion of tasks, progress of construction, evaluation of the effectiveness of the implemented measures, and an assessment of whether additional measures are necessary to meet the final compliance date of 30 September 2027.</p>	<p>1 April annually, beginning 1 April 2018</p>

- b. **Time Schedule Order R5-2017-0087.** The TSO contains a schedule for compliance with the final effluent limitations for copper, mercury, and nickel. Tasks 1 through 8, above, and the submittal dates for Annual Progress Reports, from 1 April 2018 to 1 April 2022, are the same in both compliance schedule and the TSO.
- c. **Compliance schedule for investigation and characterization of discharges at Shaft 5 and the North Bloomfield Tunnel (NBT) Outlet.** Very little information is known about the discharges from Shaft 5 of the NBT or the NBT Outlet; therefore, this Order requires the following to investigate and characterize the discharges:

Table 7. Shaft 5 and North Bloomfield Tunnel Outlet Task Schedule and Compliance Dates

Task	Compliance Date
1. Submit a Work Plan to investigate and characterize the discharges at Shaft 5 and the NBT Outlet.	1 April 2018
2. Complete the investigations of Shaft 5 and the NBT Outlet.	1 October 2020
3. Submit a Technical Report with results of the investigations and recommendations (i.e., continue or discontinue monitoring, propose treatment options if warranted, etc.).	1 April 2021
4. Implement the Technical Report recommendations from Task Item 3.	1 October 2021
5. Submit ROWD(s), if necessary.	1 October 2021
6. Submit Quarterly Progress Reports documenting the status of the investigations.	1 April, 1 July, 1 October, and 1 January beginning 1 April 2018

VII. COMPLIANCE DETERMINATION

A. Priority Pollutant Effluent Limitations. Compliance with effluent limitations for priority pollutants shall be determined in accordance with Section 2.4.5 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP), as follows:

- 1. The Discharger shall be deemed out of compliance with an effluent limitation, if the concentration of the priority pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reporting level (RL).
- 2. The Discharger shall be required to conduct a Pollutant Minimization Program (PMP) in accordance with section 2.4.5.1 of the SIP when there is evidence that the priority pollutant is present in the effluent above an effluent limitation and either:
 - a. A sample result is reported as detected, but not quantified (DNQ) and the effluent limitation is less than the RL; or
 - b. A sample result is reported as non-detect (ND) and the effluent limitation is less than the method detection limit (MDL).
- 3. When determining compliance with an average monthly effluent limitation (AMEL) and more than one sample result is available in a month, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of DNQ or ND. In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:
 - a. The data set shall be ranked from low to high, reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

- b. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.
4. If a sample result, or the arithmetic mean or median of multiple sample results, is below the RL, and there is evidence that the priority pollutant is present in the effluent above an effluent limitation and the Discharger conducts a PMP (as described in section 2.4.5.1 of the SIP), the Discharger shall not be deemed out of compliance.

ATTACHMENT A – DEFINITIONS

Arithmetic Mean (μ)

Also called the average, is the sum of measured values divided by the number of samples. For ambient water concentrations, the arithmetic mean is calculated as follows:

Arithmetic mean = $\mu = \Sigma x / n$ where: Σx is the sum of the measured ambient water concentrations, and n is the number of samples.

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.

Average Weekly Effluent Limitation (AWEL)

The highest allowable average of daily discharges over a calendar week (Sunday through Saturday), calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Bioaccumulative

Those substances taken up by an organism from its surrounding medium through gill membranes, epithelial tissue, or from food and subsequently concentrated and retained in the body of the organism.

Carcinogenic

Pollutants are substances that are known to cause cancer in living organisms.

Coefficient of Variation (CV)

CV is a measure of the data variability and is calculated as the estimated standard deviation divided by the arithmetic mean of the observed values.

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 1 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.

Detected, but Not Quantified (DNQ)

DNQ are those sample results less than the RL, but greater than or equal to the laboratory's MDL. Sample results reported as DNQ are estimated concentrations.

Dilution Credit

Dilution Credit is the amount of dilution granted to a discharge in the calculation of a water quality-based effluent limitation, based on the allowance of a specified mixing zone. It is calculated from the dilution ratio or determined through conducting a mixing zone study or modeling of the discharge and receiving water.

Effluent Concentration Allowance (ECA)

ECA is a value derived from the water quality criterion/objective, dilution credit, and ambient background concentration that is used, in conjunction with the coefficient of variation for the effluent monitoring data, to calculate a long-term average (LTA) discharge concentration. The ECA has the same meaning as waste load allocation (WLA) as used in U.S. EPA guidance (Technical Support Document For Water Quality-based Toxics Control, March 1991, second printing, EPA/505/2-90-001).

Enclosed Bays

Enclosed Bays means indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays include, but are not limited to, Humboldt Bay, Bodega Harbor, Tomales Bay, Drake's Estero, San Francisco Bay, Morro Bay, Los Angeles-Long Beach Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay. Enclosed bays do not include inland surface waters or ocean waters.

Estimated Chemical Concentration

The estimated chemical concentration that results from the confirmed detection of the substance by the analytical method below the ML value.

Estuaries

Estuaries means waters, including coastal lagoons, located at the mouths of streams that serve as areas of mixing for fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and seawater. Estuarine waters included, but are not limited to, the Sacramento-San Joaquin Delta, as defined in Water Code section 12220, Suisun Bay, Carquinez Strait downstream to the Carquinez Bridge, and appropriate areas of the Smith, Mad, Eel, Noyo, Russian, Klamath, San Diego, and Otay rivers. Estuaries do not include inland surface waters or ocean waters.

Inland Surface Waters

All surface waters of the state that do not include the ocean, enclosed bays, or estuaries.

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, over a calendar day (or 24-hour period). For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Median

The middle measurement in a set of data. The median of a set of data is found by first arranging the measurements in order of magnitude (either increasing or decreasing order). If the number of

measurements (n) is odd, then the median = $X_{(n+1)/2}$. If n is even, then the median = $(X_{n/2} + X_{(n/2)+1})/2$ (i.e., the midpoint between the n/2 and n/2+1).

Method Detection Limit (MDL)

MDL is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in in 40 C.F.R. part 136, Attachment B, revised as of July 3, 1999.

Minimum Level (ML)

ML is the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed.

Mixing Zone

Mixing Zone is a limited volume of receiving water that is allocated for mixing with a wastewater discharge where water quality criteria can be exceeded without causing adverse effects to the overall water body.

Not Detected (ND)

Sample results which are less than the laboratory's MDL.

Ocean Waters

The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Water Board's California Ocean Plan.

Persistent Pollutants

Persistent pollutants are substances for which degradation or decomposition in the environment is nonexistent or very slow.

Pollutant Minimization Program (PMP)

PMP means waste minimization and pollution prevention actions that include, but are not limited to, product substitution, waste stream recycling, alternative waste management methods, and education of the public and businesses. The goal of the PMP shall be to reduce all potential sources of a priority pollutant(s) through pollutant minimization (control) strategies, including pollution prevention measures as appropriate, to maintain the effluent concentration at or below the water quality-based effluent limitation. Pollution prevention measures may be particularly appropriate for persistent bioaccumulative priority pollutants where there is evidence that beneficial uses are being impacted. The Central Valley Water Board may consider cost effectiveness when establishing the requirements of a PMP. The completion and implementation of a Pollution Prevention Plan, if required pursuant to Water Code section 13263.3(d), shall be considered to fulfill the PMP requirements.

Pollution Prevention

Pollution Prevention means any action that causes a net reduction in the use or generation of a hazardous substance or other pollutant that is discharged into water and includes, but is not limited to, input change, operational improvement, production process change, and product reformulation (as defined in Water Code section 13263.3). Pollution prevention does not include actions that merely shift a pollutant in wastewater from one environmental medium to another environmental medium, unless clear environmental benefits of such an approach are identified to the satisfaction of the State Water Resources Control Board (State Water Board) or Central Valley Water Board.

Satellite Collection System

The portion, if any, of a sanitary sewer system owned or operated by a different public agency than the agency that owns and operates the wastewater treatment facility that a sanitary sewer system is tributary to.

Source of Drinking Water

Any water designated as municipal or domestic supply (MUN) in a Central Valley Water Board Basin Plan.

Standard Deviation (σ)

Standard Deviation is a measure of variability that is calculated as follows:

$$\sigma = (\sum[(x - \mu)^2]/(n - 1))^{0.5}$$

where:

x is the observed value;

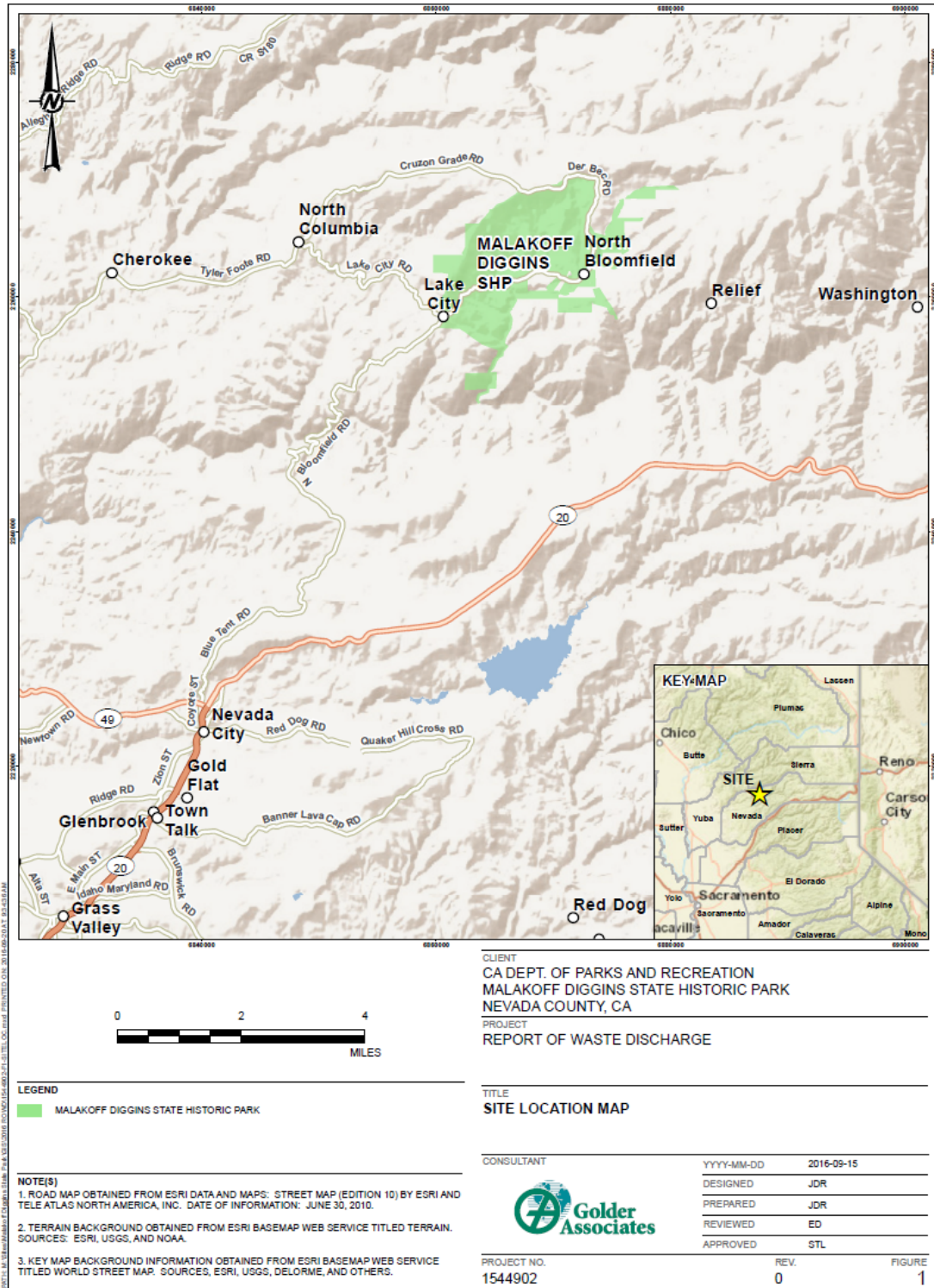
μ is the arithmetic mean of the observed values; and

n is the number of samples.

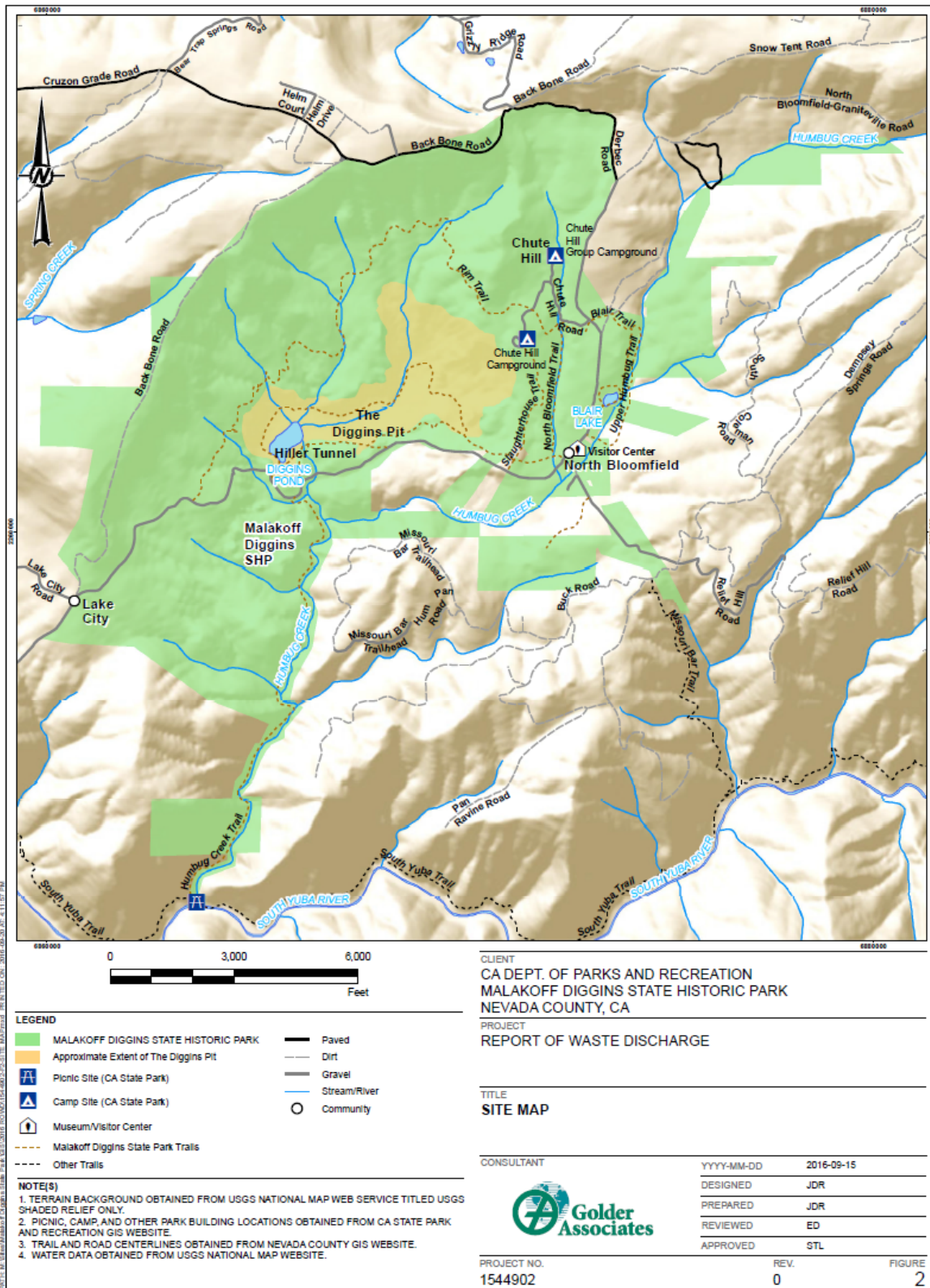
Toxicity Reduction Evaluation (TRE)

TRE is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.)

ATTACHMENT B-1 – LOCATION MAP



ATTACHMENT B-2 – PARK SCHEMATIC



ATTACHMENT B-3 – SITE MAP

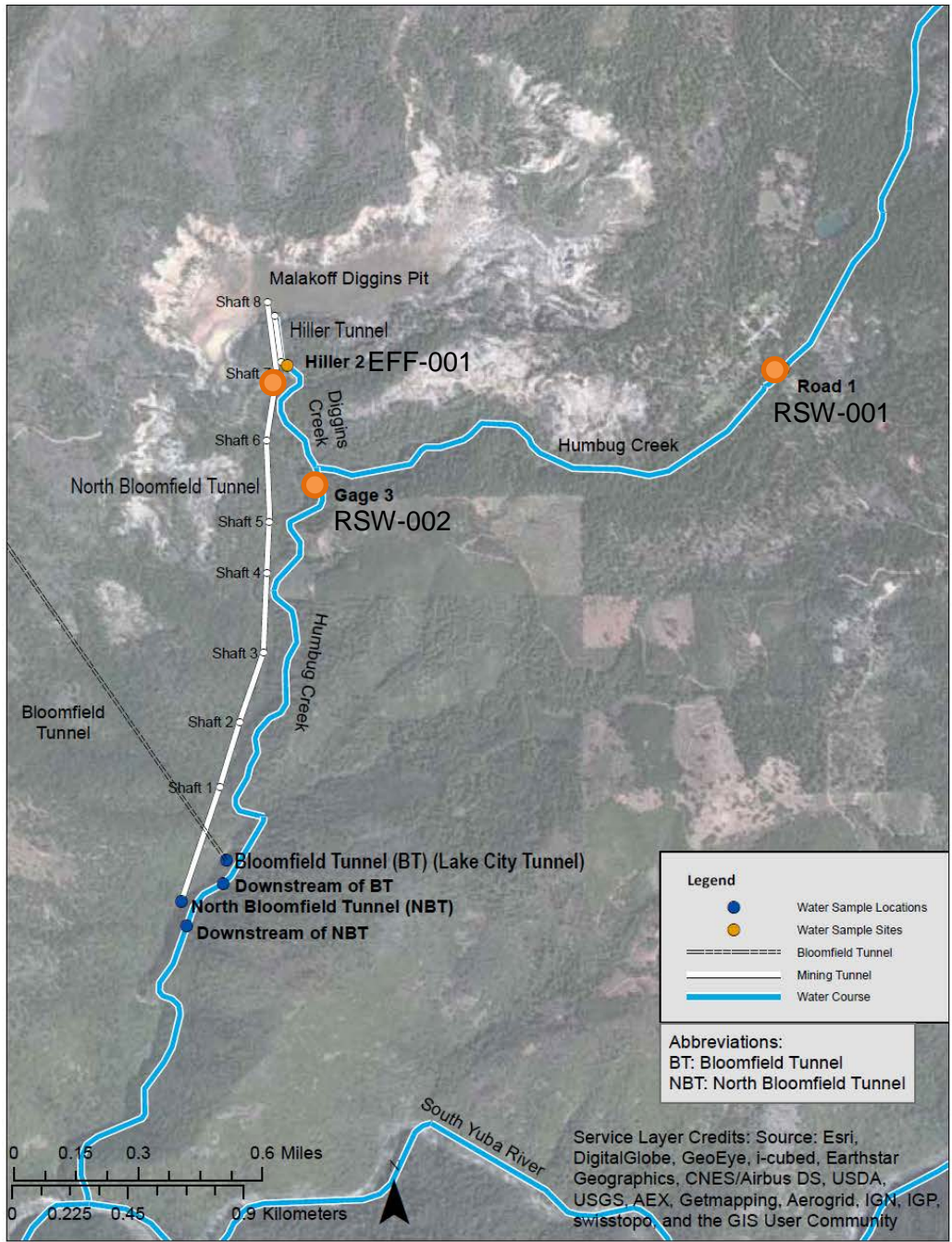


Figure 27. Humbug Creek Site Features – Water Quality Sample Sites and Additional Sample Locations
 The water quality sampling locations included three sampling sites (Road 1, Hiller 2 and Gage 3), as well as additional locations that were sampled one time on February 13, 2012 to look for additional mercury sources; these included water quality sampling locations at the Bloomfield Tunnel (also called Lake City), Humbug Creek downstream of the Bloomfield Tunnel, the North Bloomfield Tunnel, and Humbug Creek downstream of the North Bloomfield Tunnel.

ATTACHMENT C – FLOW SCHEMATIC

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ATTACHMENT D – STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger must comply with all of the terms, requirements, and conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code and is grounds for enforcement action; permit termination, revocation and reissuance, or modification; denial of a permit renewal application; or a combination thereof. (40 C.F.R. § 122.41(a); Wat. Code, §§ 13261, 13263, 13265, 13268, 13000, 13001, 13304, 13350, 13385.)
2. The Discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not yet been modified to incorporate the requirement. (40 C.F.R. § 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 C.F.R. § 122.41(c).)

C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge or solids use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment. (40 C.F.R. § 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 C.F.R. § 122.41(e).)

E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges. (40 C.F.R. § 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 C.F.R. § 122.5(c).)

F. Inspection and Entry

The Discharger shall allow the Central Valley Water Board, State Water Board, U.S. EPA, 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 (33 U.S.C. § 1318(a)(4)(B); 40 C.F.R. § 122.41(i); Wat. Code, § 13267, 13383):

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 (33 U.S.C § 1318(a)(4)(B)(ii); 40 C.F.R. § 122.41(i)(1); Wat. Code, §§ 13267, 13383);
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order (33 U.S.C. § 1318(a)(4)(B)(ii); 40 C.F.R. § 122.41(i)(2); Wat. Code, §§ 13267, 13383);
3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order (33 U.S.C § 1318(a)(4)(B)(ii); 40 C.F.R. § 122.41(i)(3); Wat. Code, § 13267, 13383); and
4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the Water Code, any substances or parameters at any location. (33 U.S.C § 1318(a)(4)(B); 40 C.F.R. § 122.41(i)(4); Wat. Code, §§ 13267, 13383.)

G. Bypass

1. Definitions
 - a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. (40 C.F.R. § 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 C.F.R. § 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 C.F.R. § 122.41(m)(2).)
3. Prohibition of bypass. Bypass is prohibited, and the Central Valley Water Board may take enforcement action against a Discharger for bypass, unless (40 C.F.R. § 122.41(m)(4)(i)):
 - a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage (40 C.F.R. § 122.41(m)(4)(i)(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 C.F.R. § 122.41(m)(4)(i)(B)); and
 - c. The Discharger submitted notice to the Central Valley Water Board as required under Standard Provisions – Permit Compliance I.G.5 below. (40 C.F.R. § 122.41(m)(4)(i)(C).)
4. The Central Valley Water Board may approve an anticipated bypass, after considering its adverse effects, if the Central Valley Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above. (40 C.F.R. § 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 C.F.R. § 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 C.F.R. § 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 Discharger. 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 C.F.R. § 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 C.F.R. § 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 C.F.R. § 122.41(n)(3)):
 - a. An upset occurred and that the Discharger can identify the cause(s) of the upset (40 C.F.R. § 122.41(n)(3)(i));
 - b. The permitted facility was, at the time, being properly operated (40 C.F.R. § 122.41(n)(3)(ii));
 - c. The Discharger submitted notice of the upset as required in Standard Provisions – Reporting V.E.2.b below (24-hour notice) (40 C.F.R. § 122.41(n)(3)(iii)); and
 - d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above. (40 C.F.R. § 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 C.F.R. § 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 C.F.R. § 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 C.F.R. § 122.41(b).)

C. Transfers

This Order is not transferable to any person except after notice to the Central Valley Water Board. The Central Valley 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 Water Code. (40 C.F.R. § 122.41(l)(3); 122.61.)

III. STANDARD PROVISIONS – MONITORING

- A.** Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (40 C.F.R. § 122.41(j)(1).)
- B.** Monitoring results must be conducted according to test procedures approved under 40 C.F.R. part 136 for the analyses of pollutants unless another method is required under 40 C.F.R. subchapters N or O. In the case of pollutants for which there are no approved methods under 40 C.F.R. part 136 or otherwise required under 40 C.F.R. subchapters N or O, monitoring must be conducted according to a test procedure specified in this Order for such pollutants. (40 C.F.R. § 122.41(j)(4); 122.44(i)(1)(iv).)

IV. STANDARD PROVISIONS – RECORDS

- A.** Except for records of monitoring information required by this Order related to the Discharger's solids use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 C.F.R. part 503), 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 Central Valley Water Board Executive Officer at any time. (40 C.F.R. § 122.41(j)(2).)
- B.** Records of monitoring information shall include:
 - 1. The date, exact place, and time of sampling or measurements (40 C.F.R. § 122.41(j)(3)(i));
 - 2. The individual(s) who performed the sampling or measurements (40 C.F.R. § 122.41(j)(3)(ii));
 - 3. The date(s) analyses were performed (40 C.F.R. § 122.41(j)(3)(iii));
 - 4. The individual(s) who performed the analyses (40 C.F.R. § 122.41(j)(3)(iv));
 - 5. The analytical techniques or methods used (40 C.F.R. § 122.41(j)(3)(v)); and
 - 6. The results of such analyses. (40 C.F.R. § 122.41(j)(3)(vi).)
- C.** Claims of confidentiality for the following information will be denied (40 C.F.R. § 122.7(b)):
 - 1. The name and address of any permit applicant or Discharger (40 C.F.R. § 122.7(b)(1)); and
 - 2. Permit applications and attachments, permits and effluent data. (40 C.F.R. § 122.7(b)(2).)

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information

The Discharger shall furnish to the Central Valley Water Board, State Water Board, or U.S. EPA within a reasonable time, any information which the Central Valley Water Board, State

Water Board, or U.S. EPA 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 Central Valley Water Board, State Water Board, or U.S. EPA copies of records required to be kept by this Order. (40 C.F.R. § 122.41(h); Wat. Code, §§ 13267, 13383.)

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the Central Valley Water Board, State Water Board, and/or U.S. EPA 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 C.F.R. § 122.41(k).)
2. All permit applications shall be signed 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 U.S. EPA). (40 C.F.R. § 122.22(a)(3).)
3. All reports required by this Order and other information requested by the Central Valley Water Board, State Water Board, or U.S. EPA shall be signed by a person described in Standard Provisions – Reporting V.B.2 above, 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 Standard Provisions – Reporting V.B.2 above (40 C.F.R. § 122.22(b)(1));
 - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a 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 C.F.R. § 122.22(b)(2)); and
 - c. The written authorization is submitted to the Central Valley Water Board and State Water Board. (40 C.F.R. § 122.22(b)(3).)
4. If an authorization under Standard Provisions – Reporting V.B.3 above 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 Standard Provisions – Reporting V.B.3 above must be submitted to the Central Valley Water Board and State Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative. (40 C.F.R. § 122.22(c).)
5. Any person signing a document under Standard Provisions – Reporting V.B.2 or V.B.3 above 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 C.F.R. § 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 C.F.R. § 122.41(l)(4).)
2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Central Valley Water Board or State Water Board for reporting results of monitoring of solids use or disposal practices. (40 C.F.R. § 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 C.F.R. part 136, or another method required for an industry-specific waste stream under 40 C.F.R. subchapters N or O, the results of such monitoring shall be included in the calculation and reporting of the data submitted in the DMR or solids reporting form specified by the Central Valley Water Board. (40 C.F.R. § 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 C.F.R. § 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 C.F.R. § 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 C.F.R. § 122.41(l)(6)(i).)
2. The following shall be included as information that must be reported within 24 hours under this paragraph (40 C.F.R. § 122.41(l)(6)(ii)):
 - a. Any unanticipated bypass that exceeds any effluent limitation in this Order. (40 C.F.R. § 122.41(l)(6)(ii)(A).)
 - b. Any upset that exceeds any effluent limitation in this Order. (40 C.F.R. § 122.41(l)(6)(ii)(B).)
3. The Central Valley 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 C.F.R. § 122.41(l)(6)(iii).)

F. Planned Changes

The Discharger shall give notice to the Central Valley 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 C.F.R. § 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 section 122.29(b) (40 C.F.R. § 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 that are subject neither to effluent limitations in this Order nor to notification requirements under section 122.42(a)(1) (see Additional Provisions—Notification Levels VII.A.1). (40 C.F.R. § 122.41(l)(1)(ii).)
3. The alteration or addition results in a significant change in the Discharger's solids use or 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 not reported during the permit application process or not reported pursuant to an approved land application plan. (40 C.F.R. § 122.41(l)(1)(iii).)

G. Anticipated Noncompliance

The Discharger shall give advance notice to the Central Valley Water Board or State Water Board of any planned changes in the permitted facility or activity that may result in noncompliance with this Order's requirements. (40 C.F.R. § 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 C.F.R. § 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 Central Valley Water Board, State Water Board, or U.S. EPA, the Discharger shall promptly submit such facts or information. (40 C.F.R. § 122.41(l)(8).)

VI. STANDARD PROVISIONS – ENFORCEMENT

- A. The Central Valley Water Board is authorized to enforce the terms of this permit under several provisions of the Water Code, including, but not limited to, sections 13385, 13386, and 13387.
- B. Etc.

VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS

A. Non-Municipal Facilities

Existing manufacturing, commercial, mining, and silvicultural Dischargers shall notify the Central Valley Water Board as soon as they know or have reason to believe (40 C.F.R. § 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 C.F.R. § 122.42(a)(1)):
 - a. 100 micrograms per liter ($\mu\text{g/L}$) (40 C.F.R. § 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 C.F.R. § 122.42(a)(1)(ii));

- c. Five (5) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 C.F.R. § 122.42(a)(1)(iii)); or
 - d. The level established by the Central Valley Water Board in accordance with section 122.44(f). (40 C.F.R. § 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 C.F.R. § 122.42(a)(2)):
 - a. 500 micrograms per liter ($\mu\text{g/L}$) (40 C.F.R. § 122.42(a)(2)(i));
 - b. 1 milligram per liter (mg/L) for antimony (40 C.F.R. § 122.42(a)(2)(ii));
 - c. Ten (10) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 C.F.R. § 122.42(a)(2)(iii)); or
 - d. The level established by the Central Valley Water Board in accordance with section 122.44(f). (40 C.F.R. § 122.42(a)(2)(iv).)

ATTACHMENT E – MONITORING AND REPORTING PROGRAM

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ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

The Code of Federal Regulations (40 C.F.R. § 122.48) requires that all NPDES permits specify monitoring and reporting requirements. Water Code sections 13267 and 13383 also authorize the Central Valley Water Board to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements that implement federal and California regulations.

I. GENERAL MONITORING PROVISIONS

- A.** Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring locations specified below and, unless otherwise specified, before the monitored flow joins or is diluted by any other waste stream, body of water, or substance. Monitoring locations shall not be changed without notification to and the approval of the Central Valley Water Board.
- B.** 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. All effluent samples are grab samples and no permanent structures are required.
- C.** Chemical, bacteriological, and bioassay analyses of any material required by this Order shall be conducted by a laboratory certified for such analyses by the State Water Resources Control Board (State Water Board), Division of Drinking Water (DDW; formerly the Department of Public Health). Laboratories that perform sample analyses must be identified in all monitoring reports submitted to the Central Valley Water Board. In the event a certified laboratory is not available to the Discharger for any onsite field measurements such as pH, dissolved oxygen (DO), turbidity, temperature, and residual chlorine, such 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 for any onsite field measurements such as pH, DO, turbidity, temperature, and residual chlorine must be kept onsite in the treatment facility laboratory and shall be available for inspection by Central Valley Water Board staff. The Discharger must demonstrate sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform these field measurements. The Quality Assurance-Quality Control Program must conform to USEPA guidelines or to procedures approved by the Central Valley Water Board.
- D.** Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. All monitoring 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. All flow measurement devices shall be calibrated at least once per year to ensure continued accuracy of the devices.
- E.** Monitoring results, including noncompliance, shall be reported at intervals and in a manner specified in this Monitoring and Reporting Program.
- F.** Laboratories analyzing monitoring samples shall be certified by DDW, in accordance with the provision of Water Code section 13176, and must include quality assurance/quality control data with their reports.
- G.** The Discharger shall ensure that the results of the Discharge Monitoring Report-Quality Assurance (DMR-QA) Study or the most recent Water Pollution Performance Evaluation

Study are submitted annually to the State Water Resources Control Board at the following address:

State Water Resources Control Board Quality Assurance Program Officer
Office of Information Management and Analysis
State Water Resources Control Board
1001 I Street, Sacramento, CA 95814

- H. The Discharger shall file with the Central Valley Water Board technical reports on self-monitoring performed according to the detailed specifications contained in this Monitoring and Reporting Program.
- I. The results of all monitoring required by this Order shall be reported to the Central Valley 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.

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:

Table E-1. Monitoring Station Locations

Discharge Point Name	Monitoring Location Name	Monitoring Location Description
001	EFF-001	Diggins Creek (Hiller 2) 2100 feet prior to discharge to Humbug Creek Latitude: 39° 22' 3.4" Longitude: 120° 55' 17.4"
--	RSW-001	Humbug Creek (Road 1), 1.4 miles upstream of the confluence with Diggins Creek Latitude: 39° 21' 59.8 Longitude: 120° 53' 57.5"
--	RSW-002	Humbug Creek (Gage 3), 98 feet downstream of the confluence with Diggins Creek Latitude: 39° 21' 45.9" Longitude: 120° 55' 15.1"

The North latitude and West longitude information in Table E-1 is approximate for administrative purposes.

III. INFLUENT MONITORING REQUIREMENTS – NOT APPLICABLE

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Location EFF-001

The Discharger shall monitor hydraulic mine pit wastewater from Hiller Tunnel at EFF-001 as follows. If more than one analytical test method is listed for a given parameter, the Discharger must select from the listed methods and corresponding Minimum Level:

Table E-2. Effluent Monitoring - EFF-001

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	MGD	Grab	1	--
Conventional Pollutants				
pH	standard units	Grab	1	2, 3
Total Suspended Solids	mg/L	Grab	1	2

Priority Pollutants				
Chromium, Total (in lieu of Chromium III)	µg/L	Grab	1	2, 4, 5
Copper, Total Recoverable	µg/L	Grab	1	2, 4, 5
Lead, Total Recoverable	µg/L	Grab	1	2, 4, 5
Mercury, Total Recoverable	µg/L	Grab	1	2, 4, 5, 6
Nickel, Total Recoverable	µg/L	Grab	1	2, 4, 5
Zinc, Total Recoverable	µg/L	Grab	1	2, 4, 5
Priority Pollutants and Other Constituents of Concern	See Section IX.A	See Section IX.A	See Section IX.A	2, 4, 5, 6
Non-Conventional Pollutants				
Aluminum, Total Recoverable	µg/L	Grab	1	2, 7
Dissolved Oxygen	mg/L	Grab	1	2, 3
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1	2, 3
Hardness, Total (as CaCO ₃)	mg/L	Grab	1	2, 3, 5
Iron, Total Recoverable	µg/L	Grab	1	2
Manganese, Total Recoverable	µg/L	Grab	1	2
Methylmercury	µg/L	Grab	1	2, 6
Settleable Solids	ml/L	Grab	1	2
Standard Minerals	mg/L	Grab	1/Year, when discharging	2, 8
Temperature	°F	Grab	1	2, 3
Turbidity	NTU	Grab	1	2, 3
Whole Effluent Toxicity	See Section V	See Section V	See Section V	See Section V

- ¹ Within 24 hours of the start of each intermittent discharge (with the exception of discharge initiating on weekends that would need to occur within 72 hours) effluent at EFF-001 shall be sampled 1/week for up to 2 weeks, if discharge continues. Thereafter, samples will be collected 1/month, as long as the discharge continues.
- ² Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136 or by methods approved by the Central Valley Water Board or the State Water Board.
- ³ 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 at the Facility.
- ⁴ For priority pollutant constituents the reporting level shall be consistent with Sections 2.4.2 and 2.4.3 of the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (See Attachment E, Table E-8).
- ⁵ Hardness samples shall be collected concurrently with metals samples.
- ⁶ Unfiltered methyl mercury and total mercury samples shall be taken using clean hands/dirty hands procedures, as described in U.S. EPA method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels, for collection of equipment blanks (section 9.4.4.2), and shall be analyzed by U.S. EPA method 1630/1631 (Revision E) with a reporting limit of 0.05 ng/L for methyl mercury and 0.5 ng/L for total mercury.
- ⁷ Compliance with the final effluent limitations for aluminum can be demonstrated using either total or acid-soluble (inductively coupled plasma/atomic emission spectrometry or inductively coupled plasma/mass spectrometry) analysis methods, as supported by USEPA's Ambient Water Quality Criteria for Aluminum document (EPA 440/5-86-008), or other standard methods that exclude aluminum silicate particles as approved by the Executive Officer.
- ⁸ Standard minerals shall include the following: boron, calcium, iron, magnesium, potassium, sodium, chloride, manganese, phosphorus, total alkalinity (including alkalinity series), and hardness, and include verification that the analysis is complete (i.e., cation/anion balance).

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 for EFF-001 – The Discharger shall perform **monthly** acute toxicity testing, while discharging, **not to exceed 4x/year**.
 2. Sample Types – The Discharger may use flow-through or static renewal testing. For static renewal testing, the samples shall be grab samples and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at Monitoring Location EFF-001.
 3. Test Species – Test species shall be rainbow trout (*Oncorhynchus mykiss*).
 4. Methods – The acute toxicity testing samples shall be analyzed using EPA-821-R-02-012, Fifth Edition. 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 7 days following notification of test failure.
- B. Chronic Toxicity Testing.** The Discharger shall conduct three species chronic toxicity testing to determine whether the effluent at EFF-001 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, once per permit term, in 2018, while discharging at EFF-001.
 2. Sample Types – Effluent samples shall be grab samples and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at Monitoring Location EFF-001. The receiving water control shall be a grab sample obtained from Monitoring Location RSW-001, as identified in this 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.
 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 in Table E-5, below, unless an alternative dilution series is detailed in the

submitted TRE Action Plan. A receiving water control or laboratory water control may be used as the diluent.

Table E-3. Chronic Toxicity Testing Dilution Series

Sample	Dilutions ^a (%)					Control
	100	75	50	25	12.5	
% Effluent	100	75	50	25	12.5	0
% Control Water ^a	0	25	50	75	87.5	100

^a Receiving water control or laboratory water control may be used as the diluent

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. (A retest is only required in this case if the test results do not exceed the monitoring trigger specified in the Special Provision at section VI.C.2.a.iii of the Order.)
- C. WET Testing Notification Requirements.** The Discharger shall notify the Central Valley Water Board within 24-hours after the receipt of test results exceeding the monitoring trigger during regular or accelerated monitoring, 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. When the dilution series is used, 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 Central Valley Water Board with the **quarterly** self-monitoring reports, and shall contain, at minimum:
 - a. The results expressed in TUC, measured as 100/NOEC, and also measured as 100/LC50, 100/EC25, 100/IC25, and 100/IC50, as appropriate.
 - b. The percent effect at the instream waste concentration;
 - c. The statistical methods used to calculate endpoints;
 - d. The statistical output page, which includes the calculation of the percent minimum significant difference (PMSD); and
 - e. The dates of sample collection and initiation of each toxicity test.
 - f. The results compared to the numeric toxicity monitoring trigger (2 samples out of 3 with a TUC>1 and % effect > 25%).

Additionally, the **quarterly** self-monitoring reports shall contain an updated chronology of chronic toxicity test results expressed in TUC, and organized by test species, type of test

(survival, growth or reproduction), and monitoring frequency, i.e., either annually, quarterly or monthly, accelerated, or Toxicity Reduction Evaluation (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 TREs shall be submitted in accordance with the schedule contained in the Discharger's TRE Action 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. RECYCLING MONITORING REQUIREMENTS – NOT APPLICABLE

VIII. RECEIVING WATER MONITORING REQUIREMENTS

A. Monitoring Locations RSW-001 and RSW-002

1. The Discharger shall monitor Humbug Creek at RSW-001 and RSW-002 as follows:

Table E-4. Receiving Water Monitoring Requirements – RSW-001 and RSW-002

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	MGD	Meter	Continuous	--
Conventional Pollutants				
pH	standard units	Grab	1	2, 3
Total Suspended Solids	mg/L	Grab	1	2
Priority Pollutants				
Cadmium, Total Recoverable	µg/L	Grab	1	2, 4, 5
Chromium, Total (in lieu of Chromium III)	µg/L	Grab	1	2, 4, 5
Copper, Total Recoverable	µg/L	Grab	1	2, 4, 5
Lead, Total Recoverable	µg/L	Grab	1	2, 4, 5
Mercury, Total Recoverable	µg/L	Grab	1	2, 4, 5, 6
Nickel, Total Recoverable	µg/L	Grab	1	2, 4, 5
Silver, Total Recoverable	µg/L	Grab	1	2, 4, 5
Zinc, Total Recoverable	µg/L	Grab	1	2, 4, 5
Priority Pollutants and Other Constituents of Concern	See Section IX.A	See Section IX.A	See Section IX.A	2, 4, 5, 6
Non-Conventional Pollutants				
Aluminum, Total Recoverable	µg/L	Grab	1	2, 7

Color	color units	Grab	1	2, 3
Dissolved Oxygen	mg/L	Grab	1	2, 3
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1	2, 3
Hardness, Total (as CaCO ₃)	mg/L	Grab	1	2, 3, 5
Iron, Total Recoverable	µg/L	Grab	1	2
Manganese, Total Recoverable	µg/L	Grab	1	2
Methylmercury	µg/L	Grab	1	2, 6
Settleable Solids	ml/L	Grab	1	2
Standard Minerals	mg/L	Grab	1/Year	2, 8
Temperature	°C	Grab	1	2, 3
Turbidity	NTU	Grab	1	2, 3

- ¹ To be sampled on the same schedule (concurrently) as EFF-001.
- ² Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136 or by methods approved by the Central Valley Water Board or the State Water Board.
- ³ 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 at the Facility.
- ⁴ For priority pollutant constituents the reporting level shall be consistent with Sections 2.4.2 and 2.4.3 of the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (See Attachment E, Table E-8).
- ⁵ Hardness samples shall be collected concurrently with metals samples.
- ⁶ Unfiltered methyl mercury and total mercury samples shall be taken using clean hands/dirty hands procedures, as described in U.S. EPA method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels, for collection of equipment blanks (section 9.4.4.2), and shall be analyzed by U.S. EPA method 1630/1631 (Revision E) with a reporting limit of 0.05 ng/L for methyl mercury and 0.5 ng/L for total mercury.
- ⁷ Compliance with the final effluent limitations for aluminum can be demonstrated using either total or acid-soluble (inductively coupled plasma/atomic emission spectrometry or inductively coupled plasma/mass spectrometry) analysis methods, as supported by USEPA's Ambient Water Quality Criteria for Aluminum document (EPA 440/5-86-008), or other standard methods that exclude aluminum silicate particles as approved by the Executive Officer.
- ⁸ Standard minerals shall include the following: boron, calcium, iron, magnesium, potassium, sodium, chloride, manganese, phosphorus, total alkalinity (including alkalinity series), and hardness, and include verification that the analysis is complete (i.e., cation/anion balance).

B. Monitoring Locations RSW-001 and RSW-002

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions of Diggins Creek, from the discharge point to the confluence with Humbug Creek, and Humbug Creek at monitoring locations RSW-001 and RSW-002. Attention shall be given to the presence or absence of:

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

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

C. Monitoring Location Groundwater – Not Applicable

IX. OTHER MONITORING REQUIREMENTS

A. Effluent and Receiving Water Characterization

1. **Monitoring.** Samples shall be collected from the effluent (EFF-001), once each year in 2017, 2018, 2019, and 2020, when discharging. Samples shall be collected from RSW-001 and RSW-002 once each year in 2017 and 2019, concurrently with the sample collection at EFF-001. All samples shall be analyzed for the constituents listed in Table E-8, below. The results of the monitoring shall be submitted to the Central Valley Water Board in February 2018, 2019, 2020, and 2021. Each individual monitoring event shall provide representative sample results for the effluent and receiving water.
2. **Concurrent Sampling.** If sampling for both the effluent and receiving water are required, then the effluent and receiving water sampling shall be performed at approximately the same time, on the same date.
3. **Sample Type.** All effluent and receiving water samples shall be taken as grab samples.

Table E-5. Effluent and Receiving Water Characterization Monitoring

Parameter	Units	Effluent Sample Type	Maximum Reporting Level ¹
2- Chloroethyl vinyl ether	µg/L	Grab	1
Acrolein	µg/L	Grab	2
Acrylonitrile	µg/L	Grab	2
Benzene	µg/L	Grab	0.5
Bromoform	µg/L	Grab	0.5
Carbon Tetrachloride	µg/L	Grab	0.5
Chlorobenzene	µg/L	Grab	0.5
Chloroethane	µg/L	Grab	0.5
Chloroform	µg/L	Grab	2
Chloromethane	µg/L	Grab	2
Dibromochloromethane	µg/L	Grab	0.5
Dichlorobromomethane	µg/L	Grab	0.5
Dichloromethane	µg/L	Grab	2
Ethylbenzene	µg/L	Grab	2
Hexachlorobenzene	µg/L	Grab	1
Hexachlorobutadiene	µg/L	Grab	1
Hexachloroethane	µg/L	Grab	1
Methyl bromide (Bromomethane)	µg/L	Grab	1
Naphthalene	µg/L	Grab	10
3-Methyl-4-Chlorophenol	µg/L	Grab	
Tetrachloroethene	µg/L	Grab	0.5
Toluene	µg/L	Grab	2
trans-1,2-Dichloroethylene	µg/L	Grab	1
Trichloroethene	µg/L	Grab	2
Vinyl chloride	µg/L	Grab	0.5
Methyl-tert-butyl ether (MTBE)	µg/L	Grab	
Trichlorofluoromethane	µg/L	Grab	
1,1,1-Trichloroethane	µg/L	Grab	0.5
1,1,2- Trichloroethane	µg/L	Grab	0.5
1,1-dichloroethane	µg/L	Grab	0.5
1,1-dichloroethylene	µg/L	Grab	0.5

Parameter	Units	Effluent Sample Type	Maximum Reporting Level ¹
1,2-dichloropropane	µg/L	Grab	0.5
1,3-dichloropropylene	µg/L	Grab	0.5
1,1,2,2-tetrachloroethane	µg/L	Grab	0.5
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	Grab	0.5
1,2,4-trichlorobenzene	µg/L	Grab	1
1,2-dichloroethane	µg/L	Grab	0.5
1,2-dichlorobenzene	µg/L	Grab	0.5
1,3-dichlorobenzene	µg/L	Grab	0.5
1,4-dichlorobenzene	µg/L	Grab	0.5
Styrene	µg/L	Grab	
Xylenes	µg/L	Grab	
1,2-Benzanthracene	µg/L	Grab	5
1,2-Diphenylhydrazine	µg/L	Grab	1
2-Chlorophenol	µg/L	Grab	5
2,4-Dichlorophenol	µg/L	Grab	5
2,4-Dimethylphenol	µg/L	Grab	2
2,4-Dinitrophenol	µg/L	Grab	5
2,4-Dinitrotoluene	µg/L	Grab	5
2,4,6-Trichlorophenol	µg/L	Grab	10
2,6-Dinitrotoluene	µg/L	Grab	5
2-Nitrophenol	µg/L	Grab	10
2-Chloronaphthalene	µg/L	Grab	10
3,3'-Dichlorobenzidine	µg/L	Grab	5
3,4-Benzofluoranthene	µg/L	Grab	10
4-Chloro-3-methylphenol	µg/L	Grab	5
4,6-Dinitro-2-methylphenol	µg/L	Grab	10
4-Nitrophenol	µg/L	Grab	10
4-Bromophenyl phenyl ether	µg/L	Grab	10
4-Chlorophenyl phenyl ether	µg/L	Grab	5
Acenaphthene	µg/L	Grab	1
Acenaphthylene	µg/L	Grab	10
Anthracene	µg/L	Grab	10
Benzidine	µg/L	Grab	5
Benzo(a)pyrene (3,4-Benzopyrene)	µg/L	Grab	2
Benzo(g,h,i)perylene	µg/L	Grab	5
Benzo(k)fluoranthene	µg/L	Grab	2
Bis(2-chloroethoxy) methane	µg/L	Grab	5
Bis(2-chloroethyl) ether	µg/L	Grab	1
Bis(2-chloroisopropyl) ether	µg/L	Grab	10
Bis(2-ethylhexyl) phthalate	µg/L	Grab	5
Butyl benzyl phthalate	µg/L	Grab	10
Chrysene	µg/L	Grab	5
Di-n-butylphthalate	µg/L	Grab	10
Di-n-octylphthalate	µg/L	Grab	10
Dibenzo(a,h)-anthracene	µg/L	Grab	0.1
Diethyl phthalate	µg/L	Grab	10
Dimethyl phthalate	µg/L	Grab	10
Fluoranthene	µg/L	Grab	10
Fluorene	µg/L	Grab	10
Hexachlorocyclopentadiene	µg/L	Grab	5

Parameter	Units	Effluent Sample Type	Maximum Reporting Level ¹
Indeno(1,2,3-c,d)pyrene	µg/L	Grab	0.05
Isophorone	µg/L	Grab	1
N-Nitrosodiphenylamine	µg/L	Grab	1
N-Nitrosodimethylamine	µg/L	Grab	5
N-Nitrosodi-n-propylamine	µg/L	Grab	5
Nitrobenzene	µg/L	Grab	10
Pentachlorophenol	µg/L	Grab	1
Phenanthrene	µg/L	Grab	5
Phenol	µg/L	Grab	1
Pyrene	µg/L	Grab	10
Aluminum, Dissolved ⁴	µg/L	Grab	
Antimony	µg/L	Grab	5
Arsenic	µg/L	Grab	10
Asbestos	MFL	Grab	
Barium	µg/L	Grab	
Beryllium	µg/L	Grab	2
Cadmium, Dissolved ⁴	µg/L	Grab	0.5
Chromium (Total), Dissolved ⁴	µg/L	Grab	10
Chromium (VI), Dissolved ⁴	µg/L	Grab	10
Copper, Dissolved ⁴	µg/L	Grab	0.5
Cyanide	µg/L	Grab	5
Fluoride	µg/L	Grab	
Iron, Dissolved ⁴	µg/L	Grab	
Lead, Dissolved ⁴	µg/L	Grab	0.5
Mercury, Total Recoverable	µg/L	Grab	0.5
Manganese, Dissolved ⁴	µg/L	Grab	
Molybdenum	µg/L	Grab	
Nickel, Dissolved ⁴	µg/L	Grab	20
Selenium	µg/L	Grab	5
Silver, Dissolved ⁴	µg/L	Grab	0.25
Thallium	µg/L	Grab	1
Tributyltin	µg/L	Grab	
Zinc, Dissolved ⁴	µg/L	Grab	20
4,4'-DDD	µg/L	Grab	0.05
4,4'-DDE	µg/L	Grab	0.05
4,4'-DDT	µg/L	Grab	0.01
alpha-Endosulfan	µg/L	Grab	0.02
alpha-Hexachlorocyclohexane (BHC)	µg/L	Grab	0.01
Alachlor	µg/L	Grab	
Aldrin	µg/L	Grab	0.005
beta-Endosulfan	µg/L	Grab	0.01
beta-Hexachlorocyclohexane	µg/L	Grab	0.005
Chlordane	µg/L	Grab	0.1
delta-Hexachlorocyclohexane	µg/L	Grab	0.005
Dieldrin	µg/L	Grab	0.01
Endosulfan sulfate	µg/L	Grab	0.01
Endrin	µg/L	Grab	0.01
Endrin Aldehyde	µg/L	Grab	0.01
Heptachlor	µg/L	Grab	0.01
Heptachlor Epoxide	µg/L	Grab	0.02

Parameter	Units	Effluent Sample Type	Maximum Reporting Level ¹
Lindane (gamma-Hexachlorocyclohexane)	µg/L	Grab	0.5
PCB-1016	µg/L	Grab	0.5
PCB-1221	µg/L	Grab	0.5
PCB-1232	µg/L	Grab	0.5
PCB-1242	µg/L	Grab	0.5
PCB-1248	µg/L	Grab	0.5
PCB-1254	µg/L	Grab	0.5
PCB-1260	µg/L	Grab	0.5
Toxaphene	µg/L	Grab	
Atrazine	µg/L	Grab	
Bentazon	µg/L	Grab	
Carbofuran	µg/L	Grab	
2,4-D	µg/L	Grab	
Dalapon	µg/L	Grab	
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	Grab	
Di(2-ethylhexyl)adipate	µg/L	Grab	
Dinoseb	µg/L	Grab	
Diquat	µg/L	Grab	
Endothal	µg/L	Grab	
Ethylene Dibromide	µg/L	Grab	
Methoxychlor	µg/L	Grab	
Molinate (Ordram)	µg/L	Grab	
Oxamyl	µg/L	Grab	
Picloram	µg/L	Grab	
Simazine (Princep)	µg/L	Grab	
Thiobencarb	µg/L	Grab	
2,3,7,8-TCDD (Dioxin)	µg/L	Grab	
2,4,5-TP (Silvex)	µg/L	Grab	
Diazinon	µg/L	Grab	
Chlorpyrifos	µg/L	Grab	
Ammonia (as N)	mg/L	Grab	
Boron	µg/L	Grab	
Chloride	mg/L	Grab	
Flow	MGD	Grab	
Hardness (as CaCO ₃)	mg/L	Grab	
Foaming Agents (MBAS)	µg/L	Grab	
Mercury, Methyl	ng/L	Grab	
Nitrate (as N)	mg/L	Grab	
Nitrite (as N)	mg/L	Grab	
pH	Std Units	Grab	
Phosphorus, Total (as P)	mg/L	Grab	
Specific conductance (EC)	µmhos/cm	Grab	
Sulfate	mg/L	Grab	
Sulfide (as S)	mg/L	Grab	
Sulfite (as SO ₃)	mg/L	Grab	
Temperature	°C	Grab	
Total Dissolved Solids (TDS)	mg/L	Grab	

¹ The reporting levels required in this table for priority pollutant constituents are established based on Section 2.4.2 and Appendix 4 of the SIP.

- ² In order to verify if bis (2-ethylhexyl) phthalate is truly present, the Discharger shall take steps to assure that sample containers, sampling apparatus, and analytical equipment are not sources of the detected contaminant.
- ³ The Discharger is not required to conduct effluent monitoring for constituents that have already been sampled in a given month, as required in Tables E-2, E-3, and E-4, except for hardness, pH, and temperature, which shall be conducted concurrently with the effluent sampling.
- ⁴ If effluent monitoring at EFF-001 (Table E-2) and/or receiving water monitoring RSW-001 and/or RSW-002 (Table E-6) occur simultaneously with Effluent and Receiving Water Characterization monitoring, both total recoverable and dissolved fractions should be analyzed.

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. Upon written request of the Central Valley Water Board, the Discharger shall submit a summary monitoring report. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year(s).
3. **Compliance Time Schedules.** For compliance time schedules included in the Order, the Discharger shall submit to the Central Valley 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 Central Valley Water Board by letter when it returns to compliance with the compliance time schedule.
4. The Discharger shall report to the Central Valley Water 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.

B. Self-Monitoring Reports (SMRs)

1. **Electronic Submittal of SMRs.** The Discharger shall electronically submit SMRs using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (<http://www.waterboards.ca.gov/ciwqs/index.html>). The CIWQS Web site will provide additional information for SMR submittal in the event there will be a planned service interruption for electronic submittal.
2. **Monitoring Protocols for SMRs.** The Discharger shall report in the SMR the results for all monitoring specified in this MRP under sections III through IX. The Discharger shall submit monthly SMRs including the results of all required monitoring using U.S. EPA-approved test methods or other test methods specified in this Order. SMRs are to include all new monitoring results obtained since the last SMR was submitted. 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 Schedules.** Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table E-6. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On...	Monitoring Period	SMR Due Date
Continuous	Permit effective date	All	Submit with monthly SMR
1/Week	Permit effective date	Sunday through Saturday	First day of second calendar month following month of sampling
1/Month	Permit effective date	1 st day of calendar month through last day of calendar month	First day of second calendar month following month of sampling
1/Quarter	Permit effective date	1 January through 31 March 1 April through 30 June 1 July through 30 September 1 October through 31 December	1 May 1 August 1 November 1 February of following year
1/Year	Permit effective date	1 January through 31 December	1 February of following year
For Intermittent Discharges at EFF-001	Within 24 hours of the start of intermittent discharge, (with the exception of discharge initiating on weekends that would need to occur within 72 hours)	1/week for up to 2 weeks, if discharge continues. Thereafter, samples will be collected 1/month, as long as the discharge continues.	Submit with monthly SMR

4. **Reporting Protocols.** The Discharger shall report with each sample result the applicable Reporting Level (RL) and the current laboratory’s Method Detection Limit (MDL), as determined by the procedure in 40 C.F.R. 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. 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 Minimum Level (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. **Multiple Sample Data.** When determining compliance with an AMEL, AWEL, or MDEL for priority pollutants and more than one sample result is available, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of “Detected, but Not Quantified” (DNQ) or “Not Detected” (ND). In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:
 - a. The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.
 - b. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.
6. **SMR Submittal Requirements.** The Discharger shall submit SMRs 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. The Discharger is not required to duplicate the submittal of data that is entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment.
 - b. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify violations of the WDR’s; 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. The Discharger shall attach all laboratory analysis sheets, including quality assurance/quality control information, with all its SMRs for which sample analyses were performed.
7. **SMR Calculations and Reports.** The Discharger shall submit in the SMRs calculations and reports in accordance with the following requirements:
 - a. **Calendar Annual Average Limitations.** For constituents with effluent limitations specified as “calendar annual average” (electrical conductivity) the Discharger shall report the calendar annual average in the December SMR. The annual average shall be calculated as the average of the samples gathered for the calendar year.
 - b. **Mass Loading Limitations.** The Discharger shall calculate and report any mass loading (lbs/day) calculations in the SMRs. Mass loading shall be calculated as follows:
$$\text{Mass Loading (lbs/day)} = \text{Flow (MGD)} \times \text{Concentration (mg/L)} \times 8.34$$
When calculating daily mass loading, the daily average flow and constituent concentration shall be used. For weekly average mass loading, the weekly average flow and constituent concentration shall be used. For monthly average mass loading, the monthly average flow and constituent concentration shall be used.

- c. **Dissolved Oxygen Receiving Water Limitations.** The Discharger shall report monthly in the self-monitoring report the dissolved oxygen concentrations in the effluent (EFF-001) and the receiving water (RSW-001 and RSW-002).
- d. **Turbidity Receiving Water Limitations.** The Discharger shall calculate and report the turbidity increase in the receiving water applicable to the natural turbidity condition specified in Section V.A.17.a-e of the Limitations and Discharge Requirements.
- e. **Temperature Receiving Water Limitations.** The Discharger shall calculate and report the temperature increase in the receiving water based on the difference in temperature at Monitoring Locations RSW-001 and RSW-002.

C. Discharge Monitoring Reports (DMR's)

Dischargers operating a "minor" facility, if so designated in the Fact Sheet, are excepted from submitting DMR's under these requirements. However, at any time during the term of this permit, the State Water Board or Central Valley Water Board may notify such a discharger to electronically submit DMR's, at which time this exception will no longer apply.

D. Other Reports

1. **Acute and Chronic Toxicity Testing Results.** The Discharger shall report the results of any acute and chronic toxicity testing, required by Special Provisions – VI.C.2. The Discharger shall submit reports in compliance with SMR reporting requirements described in subsection X.B above.
2. **Analytical Methods Report.** Within 60 days of permit adoption, the Discharger shall submit a report outlining reporting levels (RL's), method detection limits (MDL's), and analytical methods for the constituents listed in tables E-2 and E-4. In addition, no less than 3 months prior to conducting the effluent and receiving water characterization monitoring required in Section IX. D, the Discharger shall submit a report outlining RL's, MDL's, and analytical methods for the constituents listed in Table E-5. The Discharger shall comply with the monitoring and reporting requirements for CTR constituents as outlined in section 2.3 and 2.4 of the SIP. The maximum required reporting levels for priority pollutant constituents shall be based on the Minimum Levels (ML's) contained in Appendix 4 of the SIP, determined in accordance with Section 2.4.2 and Section 2.4.3 of the SIP. In accordance with Section 2.4.2 of the SIP, when there is more than one ML value for a given substance, the Central Valley Water Board shall include as RL's, in the permit, all ML values, and their associated analytical methods, listed in Appendix 4 that are below the calculated effluent limitation. The Discharger may select any one of those cited analytical methods for compliance determination. If no ML value is below the effluent limitation, then the Central Valley Water Board shall select as the RL, the lowest ML value, and its associated analytical method, listed in Appendix 4 for inclusion in the permit. **Table E-5** provides required maximum reporting levels in accordance with the SIP.
3. **Annual Operations Report.** By 1 February of each year, the Discharger shall submit a written report to the Executive Officer containing the following or explaining why the information is not available:
 - a. The names, certificate grades, and general responsibilities of all persons employed at the Facility.
 - b. The names and telephone numbers of persons to contact regarding the plant for emergency and routine situations.

- c. A statement certifying when the flow meter(s) and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration.
- d. 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.
- e. The Discharger may also be requested to submit an annual report to the Central Valley 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.

3. Best Management Practices (BMP) Reports

The Discharger must submit a BMP Options Assessment/Engineering Evaluation by **1 April 2020**, must submit a BMP Plan by **1 October 2020** for approval by the Executive Officer, must submit confirmation of financial resource commitment for the selected BMPs by **1 April 2021**, and must submit a technical report by **1 October 2021** documenting implementation of the selected BMPs. The BMP requirements are also presented in Time Schedule Order R5-2017-0087.

4. Compliance Schedules for Special Provisions Reports

- a. The Discharger shall comply with the following reporting schedule to ensure compliance with the final effluent limitations for manganese and pH:

Table E-7. EFF-001 Task Schedule and Reporting Dates

Task	Compliance Date
1. Submit all monitoring data from wet season 2016-2017.	1 November 2017
2. Submit a Work Plan for an Engineering Evaluation that includes: <ul style="list-style-type: none"> a. Definition of spoils piles within the Pit; b. Slope Stability Analysis of Pit walls; c. Compilation of GPS coordinates for RSW-001 and RSW-002 d. Pit Assessment (that may include but is not limited to): <ul style="list-style-type: none"> • Detailed Topographic Survey. • Hydrologic Model. 	1 April 2018
3. Submit a Watershed Assessment <ul style="list-style-type: none"> a. Diggins Creek <ul style="list-style-type: none"> • Assess any other sources that may flow into Diggins Creek between Hiller Tunnel and Humbug Creek b. Humbug Creek, upstream of the confluence with Diggins Creek <ul style="list-style-type: none"> • Research additional sources of mercury, hardness-dependent metals, aluminum, iron, and manganese c. Humbug Creek, downstream of the confluence with Diggins Creek to the boundary of the Park <ul style="list-style-type: none"> • Research additional sources of mercury, hardness-dependent metals, aluminum, iron, and manganese, including but not limited to the Shaft 5 discharge to Humbug Creek and the NBT Outlet discharge to Humbug Creek. 	1 October 2018
4. Submit the Engineering Evaluation Report from Task 2.	1 October 2019
5. Submit a BMP Options Assessment/Engineering Evaluation, including but not	1 April 2020

<p>limited to the following Practices:</p> <ol style="list-style-type: none"> a. Flow Diversion Practices such as storm water conveyance, diversion dikes, and graded areas. b. Exposure Minimization Practices such as containment diking, curbing, collection basins, sumps, and covering. c. Sediment and Erosion Prevention Practices such as preservation of natural vegetation, permanent seeding and planting, interceptor dikes and swales, pipe slope drains, subsurface drains, filter fences, brush and hay bale barriers, berms, sediment traps, sediment basins, check dams, and gradient terraces. d. Infiltration Practices such as vegetated filter strips, grassed swales, and infiltration trenches. e. Mitigation Practices such as excavation, filtration units, and sedimentation basins. f. Other Minimization, Preventive, and Mitigation Practices not listed here. 	
<p>6. Submit a BMP Plan for Executive Officer approval.</p>	<p>1 October 2020</p>
<p>7. Submit confirmation of financial resource commitment for selected BMPs.</p>	<p>1 April 2021</p>
<p>8. Submit a technical report documenting implementation of BMPs.</p>	<p>1 October 2021</p>
<p>9. Submit a technical report assessing mitigation and/or control alternatives and a time schedule for implementation of the selected alternatives:</p> <ul style="list-style-type: none"> • To achieve compliance with final effluent limitations at EFF-001 by 30 September 2027. 	<p>1 April 2022</p>
<p>10. Submit confirmation of financial resource commitment for the selected mitigation and/or control alternatives.</p>	<p>1 April 2023</p>
<p>11. Submit confirmation of start of construction of selected mitigation and/or control alternatives.</p>	<p>1 April 2024</p>
<p>12. Submit a technical report documenting that construction has been completed on the selected mitigation and/or control alternatives.</p>	<p>1 April 2026</p>
<p>13. Submit a technical report documenting full operation of the selected mitigation and/or control alternatives.</p>	<p>1 April 2027</p>
<p>14. Comply with the Final Effluent Limitations at EFF-001 for manganese and pH.</p>	<p>30 September 2027</p>
<p>15. Submit Annual Progress Reports documenting the steps taken to comply with this Order, describing the completion of tasks, progress of construction, evaluation of the effectiveness of the implemented measures, and an assessment of whether additional measures are necessary to meet the final compliance date of 30 September 2027.</p>	<p>1 April, annually, beginning on 1 April 2018</p>

- b. Time Schedule Order R5-2017-0087 contains a schedule for compliance with the final effluent limitations for copper, mercury, and nickel. Tasks 1 through 8, and the submittal dates for Annual Progress Reports, from 1 April 2018 to 1 April 2022, are the same in both reporting schedules.

ATTACHMENT F – FACT SHEET

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ATTACHMENT F – FACT SHEET

As described in section II.B of this Order, the Central Valley Water Board incorporates this Fact Sheet as findings of the Central Valley Water Board supporting the issuance 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 has been prepared under a standardized format to accommodate a broad range of discharge requirements for Dischargers in California. Only those sections or subsections of this Order that are specifically identified as “not applicable” have been determined not to apply to this Discharger. Sections or subsections of this Order not specifically identified as “not applicable” are fully applicable to this Discharger.

I. PERMIT INFORMATION

The following table summarizes administrative information related to the Facility.

Table F-1. Facility Information

WDID	5A290802001
CIWQS Facility Place ID	CW-239259
Discharger	California Department of Parks and Recreation
Name of Facility	Malakoff Diggins State Historic Park
Facility Address	23579 North Bloomfield Road
	Nevada City, 95959
	Nevada County
Facility Contact, Title and Phone	Daniel Millsap, Project Manager (916) 445-8737
Authorized Person to Sign and Submit Reports	Daniel Millsap, Project Manager (916) 445-8737
Mailing Address	California Department of Parks and Recreation One Capital Mall, Suite 410 Sacramento, CA 95814
Billing Address	SAME
Type of Facility	Former Hydraulic Gold Mine
Major or Minor Facility	Minor
Threat to Water Quality	1
Complexity	A
Pretreatment Program	N
Recycling Requirements	Not Applicable
Average Storm Water Discharge to Hiller Tunnel	0.74 million gallons per day (MGD)
Facility Design Flow	Not Applicable
Watershed	South Yuba River
Receiving Water	Humbug Creek
Receiving Water Type	Inland Surface Water

- A.** California Department of Parks and Recreation (Discharger) is the owner and operator of Malakoff Diggins State Historic Park (Park), which includes a former hydraulic gold mine pit (Pit) containing exposed cliffs and waste piles. Several tunnels, and shafts associated with former mining activities are also located in the Park.

For the purposes of this Order, references to the “discharger” or “permittee” in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

- B.** The Pit discharges wastewater via Diggins Creek to Humbug Creek, a water of the United States, tributary to the South Yuba River within the South Yuba River watershed. Waste Discharge Requirements Order 76-258 (not an NPDES Permit) was issued to the Discharger for the Pit at Malakoff Diggins State Historic Park in December 1976.

Attachment B provides maps and schematics of the area around the Park. Attachment C was intentionally left blank as a placeholder for a future treatment facility flow schematic.

Prior to making any change in the point of discharge, place of use, or purpose of use of treated wastewater that results in a decrease of flow in any portion of a watercourse, the Discharger must file a petition with the State Water Board, Division of Water Rights, and receive approval for such a change. The State Water Board retains the jurisdictional authority to enforce such requirements under Water Code section 1211.

- C.** The Discharger filed a report of waste discharge (ROWD) and submitted an application for issuance of its WDR’s and NPDES permit on 20 September 2016. Additional information was requested by Central Valley Water Board staff and submitted by the Discharger on 21 and 28 December 2016. A Supplement to the Report of Waste Discharge was also submitted 28 February 2017. The application was deemed complete on 28 February 2017. A site visit was conducted on 29 November 2016, to observe the Park and Pit layout and collect additional data to develop permit limitations and requirements for waste discharge.

II. FACILITY DESCRIPTION

Malakoff Diggins State Historic Park (Park) is located at 23579 North Bloomfield Road, approximately 25 miles northeast of Nevada City, in Nevada County. See Figures B-1 through B-3. The Park consists of approximately 3200 acres in the north half of Section 1, Range 9E, Township 17N and the west half of Section 6, Range 10E, Township 17N. The Park includes the town of North Bloomfield, two campgrounds, trails, and the hydraulic mining pit, a remnant of the large-scale hydraulic mining practices at the site. The Park is the site of California’s largest former hydraulic mine, which operated from 1853 to 1884. In 1964, the former hydraulic mine and surroundings were acquired through the California State Beach, Park, Recreational, and Historical Facilities Bond Act and became a State Historic Park. The Park is on the National Register of Historic Places and is a California State Historic Landmark.

For the hydraulic mining process, water is forced through large water cannons (monitors) onto the surface of the area to be mined. This action washes away the gold-bearing materials and any overburden including boulders, gravel, sand, and clay. Hydraulic mining was used in combination with the mercury-gold amalgamation process. Elemental mercury was introduced into gold recovery sluices to trap gold flakes, which were mixed with the sediment-water slurry produced from the hydraulic mobilization of sediment. The gold in the sediments would form an amalgam with the mercury. Because mercury is very dense, the mercury and gold-mercury amalgam would remain at the bottom of the sluice, while the sand and gravel would pass through the sluice. As a result of inefficient recovery, some amount of both elemental mercury and mercury-gold amalgam was lost in the process that resulted in contaminated sediment. Mercury is not native to this area and all mercury identified at the Malakoff Diggins Pit was introduced during hydraulic mining operations.

Mining operations at Malakoff Diggins Pit were conducted by the North Bloomfield Gravel Mining Company from the late 1860s until early 1890s. During active mining activities, hundreds of millions of tons of hydraulic mining debris (approximately 40 million cubic yards) were washed into Humbug Creek and then to the South Yuba River below. Farms and cities in the Sacramento

Valley were inundated and flooded out by hydraulic mining debris that was washed down the river channels during the winter seasons. By 1883 San Francisco Bay, due to all the existing hydraulic mines, was estimated to be filling with silt at a rate of one foot per year. Debris, silt, and millions of gallons of water used daily by the mine caused extensive flooding, prompting Sacramento valley farmers to file the lawsuit *Woodruff v. North Bloomfield Mining and Gravel Company*. On January 7, 1884 Judge Lorenzo Sawyer declared hydraulic mining illegal.

The Park includes five distinct mining-related features: 1) the North Bloomfield Tunnel (NBT), 2) a series of access shafts associated with the NBT, 3) the Bloomfield Tunnel (of the Bloomfield Hydraulic Mine now called Lake City Tunnel), 4) the Pit, and 5) the Hiller Tunnel, which drains wastewater from the Pit into Diggins Creek.

The NBT is 2,392 m (7,847 ft) long and was constructed from 1872 to 1874 to convey hydraulic mine debris away from the hydraulic mine workings in the Pit to Humbug Creek and to process the mine debris as a tunnel sluice during peak operations (1874-1884). Human access to this tunnel is currently blocked but it does discharge mine wastewater to Humbug Creek at the NBT outlet at a relatively constant year-round flow. This discharge has not been fully characterized.

There are eight access shafts associated with the construction of the NBT at approximately 300 m (1,000 ft) intervals. The access shafts are labeled 1 through 8, with Shaft 8 being the tunnel inlet in the pit and Shaft 1 being the nearest access shaft to the tunnel outlet along Humbug Creek. Many of the access shafts hold standing water, one of which, Shaft 5 (the "Red Shaft"), visibly discharges orange water to Humbug Creek, as observed by staff during the November 2016 inspection. There is a relatively constant year-round discharge flow from Shaft 5. This discharge has not been fully characterized.

The Pit is approximately 7,000 feet long, up to 3,800 feet wide and is 600 feet deep in some areas. Barren and unstable cliffs (Pit walls) surround the perimeter of the Pit. Precipitation and weathering cause erosion of the cliffs, and the Pit is growing in size as the walls continue to erode. The sediment from the eroded cliffs is transported through the Pit by storm water surface flow toward the west southwest and Diggins Pond, which is unlined and measured approximately 0.21 acres in 2012. If unabated, landslides and cliff erosion will continue for hundreds or thousands of years until the slopes reach the angle of repose. The pond is shrinking in size as it fills with eroded sediment. Water exits the Pit through the Hiller Tunnel (constructed in 1859), which is approximately 557 feet long. Flow from the Hiller Tunnel is termed "Diggins Creek." Diggins Creek flows into Humbug Creek approximately 0.32 mile (1700 feet) downstream of the Hiller Tunnel outlet. There are no noted influent streams to Diggins Creek between the Hiller Tunnel discharge and Humbug Creek. Humbug Creek flows to the South Fork Yuba River, approximately 2.2 miles downstream.

While there is some vegetation on the Pit floor and the area of vegetation is increasing over time, vegetation is also being buried by continued deposition of eroded materials from the cliff walls. Thus, natural vegetative growth that would help stabilize the site is increasing very slowly.

The majority of the fine-grained sediment that is discharged to Humbug Creek, originates from unstable slopes in the Pit. Fine-grained silts and clays (less than 0.063 millimeters) contains the greatest concentration of mercury in contaminated sediment. Mercury and other metals are mobilized during storm events and adsorb onto the fine silt and clay sediment particles which are discharged to Humbug Creek and South Yuba River during storm events. Mercury concentrations in surface water tend to correlate well with surface water Total Suspended Solids concentrations, as fine sediment is re-suspended in the water column during storm events. Mercury adsorbed to fine sediment can stay in suspension for long periods of time and be transported long distances to locations where it can be methylated upon deposition. Disturbance of mercury-contaminated sediment increases the concentration and load of mercury in downstream waters.

Humbug Creek is listed pursuant to Section 303(d) of the Clean Water Act as impaired for pH, sedimentation/siltation, mercury, iron, chromium, copper, and zinc. The South Yuba River is 303(d) listed for mercury and temperature for approximately 22 miles downstream of Humbug Creek to Englebright Lake. Englebright Lake is listed for mercury.

Waste Discharge Requirements Order 76-258 was issued to the Department of Parks and Recreation for Malakoff Diggins State Historic Park and discharge from the Pit in December 1976. Over 30 studies of the Pit discharge have been completed by various agencies since Order 76-258 was issued. Many of the studies conclude that sediment from the Pit is the primary issue and that by stopping the sediment, the particulate bound mercury and other metals will be greatly reduced in the discharge. In addition, the reports conclude that other sources of sediment, mercury, and metals may exist upstream of the Diggins Creek confluence with Humbug Creek and downstream as well.

There are a number of potential remedies to reduce sediment discharge from the Pit, which will be assessed upon completion of the site investigation. The Department of Parks and Recreation has a mandate to assure that its actions do not adversely impact significant resources under its jurisdiction. Which in the case of Malakoff Diggins State Historic Park, the park is listed on the National Register of Historic Places for its important association with California gold mining and its precedent-setting environmental law. As part of the nomination to the National Register of Historic Places, the Park was described as “picturesque and monumental”; therefore, it is of utmost importance for the Department of Parks and Recreation to maintain the existing physical condition of the park. For these reasons, the Discharger and Water Board staff will continue to work toward solutions that will allow the Park to maintain its historic significance while at the same time comply with water quality criteria.

A. Description of Wastewater and Sediment Treatment and Controls

Water Quality data collected by The Sierra Fund as part of the Humbug Creek Watershed Assessment Project (see *Humbug Creek Watershed Assessment and Management Recommendations*, The Sierra Fund, June 2014) identified turbidity during high flow events at 1,000 to 2,000 NTU, and total mercury at 0.4 to 0.5 micrograms per liter. Other metals such as aluminum, chromium, copper, iron, lead, manganese, nickel, and zinc have also been identified in the discharge samples. The Pit discharge also contains elevated levels of suspended sediment and pH outside the ranges required in the Basin Plan Water Quality Objectives.

In the ROWD, flow rates were provided for Hiller Tunnel for storm event monitoring between the storm-season months of mid-October through mid-June in 2011 to 2016. There are no flow data included for the dry season months of late-June, July, August, September, through early-October because there was no discharge. This Order requires continuous monitoring while discharging. According to existing observation, flow from Hiller Tunnel to Diggins Creek does not occur during dry periods. Since the receiving water, Humbug Creek, is an ephemeral stream the minimum flow can also be zero and the maximum flow in Diggins Creek was measured at 6.5 MGD there is potential for Humbug Creek to be effluent dominated at times.

To locate potential sources of metals in the Hiller Tunnel discharge, two mineral springs were sampled in the eastern corner of the Pit during low water conditions. The springs discharge perennially, and while acidic, do not contain elevated levels of dissolved metals. During drought conditions, water from the springs does not reach Diggins Creek.

The annual sediment load in Humbug Creek is estimated to be at least 500,000 kg/yr (500 tons/yr), and the annual mercury load is at least 100 g/yr (0.25 lb/yr). At least half of the

annual sediment and mercury load in Humbug Creek is from episodic production during storm events.

The Sierra Fund reported that at the upstream Humbug Creek monitoring site (formerly Road 1 and now RSW-001), mercury was primarily in the dissolved form, but at the confluence with Diggins Creek (formerly Hiller 2 and now EFF-001) and below the confluence at the downstream Humbug Creek monitoring location (formerly Gage 3 and now RSW-002), the majority of the mercury was in the particulate-bound form. Therefore, mercury below the pit drainage is primarily transported in particulate-bound form and is highly correlated with total suspended sediment in Humbug Creek.

Diggins Creek is a source of sediment and particulate forms of mercury, aluminum, chromium, copper, iron, lead, manganese, nickel, and zinc to Humbug Creek during storm events. The Sierra Fund also reported that Humbug Creek has lower levels of metals upstream of Diggins Creek (Road 1) and increased concentrations downstream of the confluence with Diggins Creek (Gage 3) during storm events. Additional sampling of metals in the total and dissolved form confirmed that the metals in the Hiller Tunnel outlet discharge are primarily in the particulate-bound form.

To date, there is no comprehensive wastewater and sediment collection and/or treatment system in operation for the Pit. This Order contains a 10-year compliance schedule for compliance with manganese and pH effluent limitations and a compliance date of October 2021 for implementation of BMPs to control sediment discharge. Time Schedule Order R5-2017-0087 that accompanies this Order contains a 5-year compliance schedule for compliance with the effluent limitations for the CTR constituents, copper, mercury, and nickel, as required by Federal regulations.

B. Discharge Points and Receiving Waters

1. The Park and the Pit are located in the north half of Section 1, Range 9E, Township 17N and the west half of Section 6, Range 10E, Township 17N., MDB&M, as shown in Attachment B, a part of this Order. The approximate midpoint of the Pit is located at latitude 39° 22' 12.1" N and longitude 120° 55' 07.9" W.
2. Untreated mine waste is discharged at Discharge Point 001 from Hiller Tunnel to Diggins Creek and is transported 2100 feet downstream to Humbug Creek, a water of the United States and a tributary to the South Yuba River at a point latitude 39° 22' 3.2" N and longitude 120° 55' 17.2" W.
3. Discharge from Shaft 5 of the NBT to Humbug Creek.
4. Discharge from the NBT Outlet to Humbug Creek.
5. Discharge Point 001, Shaft 5, and NBT Outlet are located in the North Bloomfield Hydrologic Sub Area, South Yuba Hydrologic Area, Yuba River Hydrologic Unit, Sacramento Hydrologic Basin.
6. Storm water collects in the watershed above the Pit, and then drains over the cliffs surrounding the Pit, where it flows over and through the mine tailings within the Pit. There are also several natural springs within the Pit that flow year-round during normal to wet years. Drainage from the Pit runoff and spring flow collects in the pond, where it then spills into Hiller Tunnel after it reaches a high enough elevation. The discharge then travels 500 feet through the hard rock tunnel and directly discharges out of the tunnel at EFF-001, forming the headwaters of Diggins Creek.
7. Diggins Creek was named after Malakoff Diggins State Historic Park was established. At the time mining started there was a hillside drainage area named Virgin Creek. Virgin

Creek was then connected to the pond via Hiller Tunnel (constructed in 1859 by miners) and eventually became the drainage conveyance outlet for the Pit that is now called Diggins Creek. Diggins Creek was formerly a natural drainage course that was incorporated into the only drainage conveyance outlet for the Pit, through construction of the tunnel. Diggins Creek may have year-round flow during wet years due to several perennial springs within the Pit and stormwater flows. Diggins Creek is composed of effluent at most times, except when stormwater runoff from surrounding hillsides enter the creek. The runoff from the surrounding hillsides only makes up a small portion of the flow in Diggins Creek. Flow in Diggins Creek has been measured between zero MGD and 6.5 MGD. Diggins Creek is considered a wastewater conveyance.

8. RSW-001 is on Humbug Creek 1.4 miles upstream of the confluence with Diggins Creek.
9. A continuous monitoring gage and an automated water sampler have been installed at the former Gage 3 site (RSW-002) on Humbug Creek 98 feet downstream of the confluence with Diggins Creek. In November 2015 a minimum flow of zero MGD was reported for Humbug Creek upstream of the discharge at RSW-001 and 0.084 MGD was reported in Humbug Creek downstream of the discharge. Peak flow in Humbug Creek was measured at 22 MGD upstream of the discharge and 27 MGD downstream of the discharge in March 2016. Humbug Creek is visibly impacted by the sediment-bearing Diggins Creek during storm events. Since the receiving water, Humbug Creek, minimum flow is 0.0 MGD and the maximum flow in Diggins Creek was measured at 6.5 MGD, there is potential for Humbug Creek to be effluent dominated by flow from Diggins Creek.
10. Humbug Creek is established as the receiving water and the TMDLs established on Humbug Creek will be used as support for effluent limitations. The location of EFF-001 is Diggins Creek as it exits Hiller Tunnel.

C. Summary of Existing Requirements and Historic Monitoring Data

Waste Discharge Requirement Order 76-258 was issued to the Department of Parks and Recreation for Malakoff Diggins State Historic Park, for discharges from the Pit, in December 1976. This Order required the Discharger to:

1. Not cause pollution or nuisance;
2. Comply with the Monitoring and Reporting Program (MRP), which included monitoring for turbidity and flow, and reporting monthly; and
3. Initiate a study to define and implement the best management practices for reduction of the turbid water discharge from Diggins Creek to Humbug Creek at Malakoff Diggins State Historic Park.

An effluent monitoring location in Diggins Creek and upstream and downstream receiving water monitoring locations in Humbug Creek were established in 2014. The data collected by the Sierra Fund and the Discharger between 2011 and 2016 is tabulated in the 20 September 2016 Report of Waste Discharge and emails from the Discharger dated 21 December 2016 and 28 December 2016. The Discharger collected new data in late 2016 and early 2017 that was compiled in the ROWD Supplement dated 26 February 2017. Tables F-2 and F-3, below, contain summaries of data found in the ROWD, ROWD supplement, and *Humbug Creek Watershed Assessment and Management Recommendations* (The Sierra Fund, June 2014).

Table F-2. Historic Metal Data

Metal	Units	Maximum Concentration from Hiller Tunnel		Maximum Upstream Receiving Water Concentration	
		Total Recoverable	Dissolved	Total Recoverable	Dissolved
Aluminum	µg/L	27000	120	1800	39
Cadmium	µg/L	0.42 J	<0.04	<0.04	<0.04
Chromium	µg/L	92	0.33	1.3	<0.14
Copper	µg/L	180	2.5	7.1	3.2
Iron	µg/L	39000	180	2800	25
Lead	µg/L	55	0.11 J	1.0	<0.078
Manganese	µg/L	1400	410	98	<12
Mercury	µg/L	0.74	0.025 J	0.016 J	0.017 J
Nickel	µg/L	130	33	22	5.7
Silver	µg/L	0.48 J	<0.025	<0.25	<0.025
Zinc	µg/L	200	5.8 J	5.3 J	<5.0

Table F-3. Historic Water Quality Parameter Data

Constituent/ Parameter	Units	Hiller Tunnel		Upstream Receiving Water	
		Minimum	Maximum	Minimum	Maximum
Dissolved Oxygen	mg/L	9.8	16	10	14
Electrical Conductivity	µmhos/cm	0.55	130	19	150
Flow	MGD	0.0	6.55	0	22
Hardness	mg/L (as CaCO ³)	--	32	--	16
pH	Standard units	5.9	9.3	5.3	7.8
Total Suspended Solids	mg/L	25	2900	0.30	150
Turbidity	NTU	1.1	1400	0	66

D. Compliance Summary

Waste Discharge Requirements Order 76-258 was issued to the Department of Parks and Recreation for the discharge of turbid water from the former mine at Malakoff Diggins State Historic Park in December 1976. However, this Order is the first NPDES permit issued for the discharge from the Pit; therefore, there is no NPDES permit compliance history available for the Pit discharge or associated facility to treat the discharge.

E. Planned Changes

Changes will occur over the term of this Order (see Time Schedule Order R5-2017-0087). However, the nature and extent of the changes are not known at the time of Order adoption.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

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

A. Legal Authorities

This Order serves as WDR's pursuant to article 4, chapter 4, division 7 of the California Water Code (commencing with section 13260). This Order is also issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. EPA and chapter 5.5, division 7 of the Water Code (commencing with section 13370). It shall serve as an NPDES permit for point source discharges from this Facility to surface waters.

B. California Environmental Quality Act (CEQA)

Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of CEQA, (commencing with section 21100) of Division 13 of the Public Resources Code.

C. State and Federal Laws, Regulations, Policies, and Plans

1. **Water Quality Control Plans.** Requirements of this Order specifically implement the applicable Water Quality Control Plans.
 - a. **Basin Plan.** The Central Valley Water Board adopted a Water Quality Control Plan , Fourth Edition (Revised July 2016), 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. Requirements in this Order implement the Basin Plan.

The Basin Plan at II-2.00 states that the beneficial uses of any specifically identified water body generally apply to its tributary streams. The Basin Plan in Table II-1, Section II, does not specifically identify beneficial uses for Diggins Creek or Humbug Creek, but does identify existing and potential uses for the Yuba River (sources to Englebright Lake), to which Diggins Creek, via Humbug Creek and the South Yuba River, is tributary. In addition, the Basin Plan implements State Water Board Resolution 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Thus, beneficial uses applicable to Humbug Creek are as follows:

Table F-4. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	Humbug Creek	<p>Existing Surface Water: Municipal and Domestic Supply (MUN); Agricultural Irrigation and Stock Watering Supply (AGR); Industrial Power Supply (POW); Contact Recreation and Canoeing and Rafting (REC-1); Other Noncontact Recreation (REC-2); Cold Freshwater Habitat (COLD); Cold Spawning (SPWN); and Wildlife Habitat (WILD).</p>
		<p>Existing Groundwater: Municipal and Domestic Supply (MUN); Agricultural Supply (AGR); Industrial Service Supply (IND); and Industrial Process Supply (PRO).</p>

2. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** U.S. EPA adopted the NTR on 22 December 1992, and later amended it on 4 May 1995 and 9 November 1999. About forty criteria in the NTR applied in California. On 18 May 2000, U.S. EPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on 13 February 2001. These rules contain federal water quality criteria for priority pollutants.
3. **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 U.S. EPA through the NTR and to the priority pollutant objectives established by the Central Valley Water Board in the Basin Plan. The SIP became effective on 18 May 2000, with respect to the priority pollutant criteria promulgated by the U.S. EPA through the CTR. The State Water Board adopted amendments to the SIP on 24 February 2005 that became effective on 13 July 2005. The SIP establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control. Requirements of this Order implement the SIP.
4. **Antidegradation Policy.** Federal regulation 40 C.F.R. section 131.12 requires that the 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 (“Statement of Policy with Respect to Maintaining High Quality of Waters in California”). Resolution 68-16 is deemed to incorporate the federal antidegradation policy where the federal policy applies under federal law. Resolution 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Central Valley Water Board’s Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The permitted discharge must be consistent with the antidegradation provision of 40 C.F.R. section 131.12 and State Water Board Resolution 68-16.
5. **Anti-Backsliding Requirements.** Sections 402(o) and 303(d)(4) of the CWA and federal regulations at 40 C.F.R. section 122.44(l) restrict 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.

6. **Domestic Water Quality.** In compliance with Water Code section 106.3, it is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. This Order promotes that policy by requiring discharges to meet maximum contaminant levels designed to protect human health and ensure that water is safe for domestic use.
7. **Endangered Species Act Requirements.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code, §§ 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. §§ 1531 to 1544). This Order requires compliance with effluent limits, receiving water limits, and other requirements to protect the beneficial uses of waters of the state. The Discharger is responsible for meeting all requirements of the applicable Endangered Species Act.
8. **Storm Water Requirements.** USEPA promulgated federal regulations for storm water on 16 November 1990 in 40 C.F.R. parts 122, 123, and 124. The NPDES Industrial Storm Water Program regulates storm water discharges from mine facilities. Mine facilities are applicable industries under the storm water program and are obligated to comply with the federal regulations. This Order has been adopted in lieu of an industrial storm water permit and contains requirements for storm water control and mitigation.

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

1. **303(d) List.** Under section 303(d) of the 1972 CWA, states, territories and authorized tribes are required to develop lists of water quality limited segments. The waters on these lists do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. On 11 October 2011 USEPA gave final approval to California's 2008-2010 section 303(d) List of Water Quality Limited Segments. The Basin Plan references this 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 C.F.R. part 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."
 - a. Humbug Creek (Diggins Creek to Yuba River, South Fork, 2 miles) is listed pursuant to Section 303(d) of the Clean Water Act as impaired for chromium, copper, iron, mercury, pH, sedimentation/siltation, and zinc.
2. **Total Maximum Daily Loads (TMDLs).** USEPA requires the Central Valley Water Board to develop TMDLs for each 303(d) listed pollutant and water body combination. Table F-5, below, identifies the 303(d) listings and the status of each TMDL.

Table F-5. 303 (d) List for Humbug Creek

Pollutant	Potential Sources	TMDL Completion ¹	WLAs Established
Chromium	Not Listed Yet	Not Listed Yet	Not Listed Yet
Copper	Resource Extraction	(2020)	Not Listed Yet
Iron	Not Listed Yet	Not Listed Yet	Not Listed Yet

Pollutant	Potential Sources	TMDL Completion ¹	WLAs Established
Mercury	Resource Extraction	(2021)	Not Listed Yet
pH	Not Listed Yet	Not Listed Yet	Not Listed Yet
Sedimentation/Siltation	Resource Extraction	2012	Not Listed Yet
Zinc	Resource Extraction	(2020)	Not Listed Yet

¹ Dates in parentheses are proposed TMDL completion dates.

TMDLs for sedimentation/siltation in Humbug Creek were scheduled for completion in 2012, however, waste load allocations have not yet been established. A reopener has been included in this Order for sedimentation/siltation. TMDLs in Humbug Creek are scheduled for completion in 2020 for copper and zinc, and in 2021 for mercury. TMDLs for chromium, iron, and pH in Humbug Creek have not yet been scheduled. Because this Order expires in 2022, after proposed completion of the TMDLs for copper, mercury, and zinc, reopeners have been included for copper, mercury, and zinc. Reopeners have also been included for chromium, iron, and pH due to the pending TMDLs. The 303(d) listings and TMDLs have been considered in the development of this Order. A pollutant-by-pollutant evaluation of each pollutant of concern is described in section IV.C.3 of this Fact Sheet

E. Other Plans, Polices 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 CWA and amendments thereto are applicable to the discharge.

The 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 C.F.R. § 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 C.F.R. 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 C.F.R. section 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 dischargers 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 in the Code of Federal Regulations: 40 C.F.R. section 122.44(a) requires that permits include applicable technology-based limitations and standards; and 40 C.F.R. section 122.44(d) requires that permits include WQBEL’s 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 Basin Plan at page IV-17.00, contains an implementation policy, “Policy for

Application of Water Quality Objectives”, that specifies that the Central Valley 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 C.F.R. section 122.44(d)(1). With respect to narrative objectives, the Central Valley Water Board must establish effluent limitations using one or more of three specified sources, including: (1) USEPA’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 Central Valley Water Board’s “Policy for Application of Water Quality Objectives”)(40 C.F.R. § 122.44(d)(1)(vi)(A), (B) or (C)), or (3) an indicator parameter.

The Basin Plan includes numeric site-specific water quality objectives and narrative objectives for toxicity, chemical constituents, discoloration, radionuclides, and tastes and odors. The narrative toxicity objective 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 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 narrative chemical constituents objective states that waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At minimum, “...*water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)*” in Title 22 of CCR. The Basin Plan further states that, to protect all beneficial uses, the Central Valley Water Board may apply limits more stringent than MCLs. The narrative tastes and odors objective states: “*Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.*”

A. Discharge Prohibitions

- 1. Prohibition III.A (No discharge or application of waste other than that described in this Order).** This prohibition is based on Water Code section 13260 that requires filing of a ROWD before discharges can occur. The Discharger submitted a ROWD for the discharges described in this Order; therefore, discharges not described in this Order are prohibited.
- 2. Prohibition III.B (No bypasses or overflow of untreated wastewater, except under the conditions at CFR section 122.41(m)(4)).** As stated in section I.G of Attachment D, Standard Provisions, this Order prohibits bypass from any portion of the treatment facility. Federal regulations, 40 C.F.R. section 122.41(m), define “bypass” as the intentional diversion of waste streams from any portion of a treatment facility. This section of the federal regulations, 40 C.F.R. section 122.41(m)(4), prohibits bypass unless it is unavoidable to prevent loss of life, personal injury, or severe property damage. In considering the Regional Water Board’s prohibition of bypasses, the State Water Board adopted a precedential decision, Order No. WQO 2002-0015, which cites the federal regulations, 40 C.F.R. section 122.41(m), as allowing bypass only for essential maintenance to assure efficient operation.
- 3. Prohibition III.C (No controllable condition shall create a nuisance).** This prohibition is based on Water Code section 13050 that requires water quality objectives established for the prevention of nuisance within a specific area. The Basin Plan prohibits conditions that create a nuisance.

B. Technology-Based Effluent Limitations

1. Scope and Authority

Section 301(b) of the CWA and implementing U.S. EPA permit regulations at 40 C.F.R. section 122.44 require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards.

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

- a. Best practicable treatment control technology (BPT) represents the average of the best existing performance by well-operated facilities within an industrial category or subcategory. BPT standards apply to toxic, conventional, and non-conventional pollutants.
- b. 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 non-conventional pollutants.
- c. 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 a two-part reasonableness test. The first test compares the relationship between the costs of attaining a reduction in effluent discharge and the resulting benefits. The second test examines the cost and level of reduction of pollutants from the discharge from publicly owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources. Effluent limitations must be reasonable under both tests.
- d. 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 U.S. EPA to develop effluent limitations, guidelines and standards (ELGs) representing application of BPT, BAT, BCT, and NSPS. Section 402(a)(1) of the CWA and 40 C.F.R. section 125.3 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. Where BPJ is used, the Central Valley Water Board must consider specific factors outlined in 40 C.F.R. section 125.3.

2. Applicable Technology-Based Effluent Limitations

Effluent limitation guidelines (ELGs) were established at 40 CFR Part 440, Subpart J for the Copper, Lead, Zinc, Gold, Silver, and Molybdenum Ores Subcategory of the Ore Mining and Dressing Point Source Category, which is applicable to discharges from active mines that produce gold bearing ores from open-pit or underground operations, among others. Active placer and hydraulic mines are excluded from Subpart J.

ELGs were established at 40 CFR Part 440, Subpart M for the Gold Placer Mining Subcategory of the Ore Mining and Dressing Point Source Category, which is applicable to 1) active mines and dredges that produce gold or gold bearing ores from placer deposits, and 2) the beneficiation processes which use gravity separation methods for recovering gold from placer deposits. The mine at Malakoff Diggins was established on

a placer deposit; however, it is no longer an active mine, therefore the ELG's of Subpart M do not apply.

For the purposes of 40 CFR Part 440, "mine" is defined as an active mining area used in or resulting from the work of extracting metal ore or minerals from their natural deposits by any means or method, and "active mining area" is defined as a place where work or other activity related to the extraction, removal, or recovery of metal ore is being conducted. A mine consists of land and property previously used in and resulting from the work of extracting metal ore or minerals, specifically gold, from their natural deposits by any means or method. In geology, a placer deposit or placer is an accumulation of valuable minerals formed by gravity separation during sedimentary processes. The name is from the Spanish word *placer*, meaning "alluvial sand". The regulated discharge at Discharge Point 001 is from the Pit, located in a placer deposit.

The applicable ELGs for active gold mines, found in 40 CFR Part 440 (Ore Mining and Dressing Point Source Category), subpart J (Copper, Lead, Zinc, Gold, Silver, and Molybdenum Ores Subcategory), require that the concentration of pollutants discharged from mining and milling activities and in mine drainage (defined in 40 CFR § 440.132(h) as "any water drained, pumped, or siphoned from a mine") from mines not exceed the BPT and BAT limits shown in Table F-6 below:

Table F-6. Technology-Based Effluent Limitations - 40 CFR Part 440, Subpart J

Pollutant	Units	BPT		BAT	
		Maximum for any 1 day	Average of daily values for 30 consecutive days	Maximum for any 1 day	Average of daily values for 30 consecutive days
Cadmium	mg/L	--	--	0.10	0.05
Copper	mg/L	0.30	0.15	0.30	0.15
Lead	mg/L	0.6	0.3	0.6	0.3
Mercury	mg/L	0.002	0.001	0.002	0.001
pH	pH units	†	†	--	--
Total Suspended Solids	mg/L	30	20	--	--
Zinc	mg/L	1.5	0.75	1.5	0.75

† Within the range of 6.0 to 9.0.

The applicable ELGs for active gold mines, found in 40 CFR Part 440 (Ore Mining and Dressing Point Source Category), Subpart M (Gold Placer Mining Subcategory), require that the concentration of pollutants in process wastewaters (defined in 40 CFR § 440.141(a)(16) as "all water used in and resulting from the beneficiation process, including but not limited to the water used to move the ore to and through the beneficiation process, the water used to aid in classification, and the water used in gravity separation, mine drainage, and infiltration and drainage waters which commingle with mine drainage or waters resulting from the beneficiation process") from mines not exceed the BPT and BAT limits shown in Table F-7 below:

Table F-7. Technology-Based Effluent Limitations - 40 CFR Part 440, Subpart M

Effluent characteristics	BPT	BAT
	Instantaneous maximum	Instantaneous maximum
Settleable solids	0.2 ml/l	0.2 ml/l

Because the Pit is not an active mining area as defined in 40 CFR Part 440, the effluent limitations representing BPT and BAT for active mines are not required. However, as a former mining area, the Pit has extensive surface area exposed to weathering and runoff of pollutants including total suspended solids, settleable solids, and metals that have affected beneficial uses.

This Order contains monitoring and water quality-based effluent limitations for pH, copper, and mercury that are more stringent than the technology-based limitations. Additional water-quality based effluent limitations for manganese and the hardness-dependent metal, nickel are included in this Order. This Order contains receiving water limitations for settleable substances, suspended material, suspended sediment, and turbidity. It is not feasible to develop water-quality based effluent limitations for turbidity, sediment, TSS, and settleable solids. Therefore, in lieu of numeric effluent limitations, this Order contains requirements for the Discharger to implement Best Management Practices, or BMPs, to mitigate sediment discharges to the receiving water.

C. Water Quality-Based Effluent Limitations (WQBEL's) – Discharge Point 001

1. Scope and Authority

CWA Section 301(b) and 40 C.F.R. section 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

Section 122.44(d)(1)(i) of 40 C.F.R. requires that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBEL's must be established using: (1) U.S. EPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in section 122.44(d)(1)(vi).

The process for determining reasonable potential and calculating WQBEL's 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 any applicable water quality criteria contained in the CTR and NTR.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

The Basin Plan 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, the Basin Plan implements State Water Board Resolution 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply.

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 sections 131.2 and 131.10, require that all waters of the State 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. 40 C.F.R. section 131.3(e) 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 C.F.R. section 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.

- a. **Receiving Water and Beneficial Uses.** Refer to III.C.1 above for a complete description of the receiving water and beneficial uses.
- b. **Effluent and Ambient Background Data.** The reasonable potential analysis (RPA), as described in section IV.C.3 of this Fact Sheet, was based on data from 10 October 2011 through 8 February 2017, which includes wastewater discharge and ambient background data submitted in the Report of Waste Discharge (ROWD), emails from 21 December 2016 and 28 December 2016, and the ROWD Supplement dated 26 February 2017.
- c. **Conversion Factors.** The CTR contains aquatic life criteria for arsenic, cadmium, chromium III, chromium VI, copper, lead, nickel, silver, and zinc which are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. The default USEPA conversion factors contained in Appendix 3 of the SIP were used to convert the applicable dissolved criteria to total recoverable criteria.
- e. **Hardness-Dependent CTR Metals Criteria.** The CTR and the NTR contain water quality criteria for seven metals that vary as a function of hardness. The lower the hardness the lower the water quality criteria. The metals with hardness-dependent criteria include cadmium, copper, chromium III, lead, nickel, silver, and zinc.

The SIP and the CTR require the use of “receiving water” or “actual ambient” hardness, respectively, to determine effluent limitations for these metals. The CTR requires that the hardness values used shall be consistent with the design discharge conditions for design flows and mixing zones¹. Where design flows for aquatic life criteria include the lowest one-day flow with an average reoccurrence frequency of once in ten years (1Q10) and the lowest average seven consecutive day flow with an average reoccurrence frequency of once in ten years (7Q10).² This section of the CTR also indicates that the design conditions should be established such that the appropriate criteria are not exceeded more than once in a three year period on average.³ The CTR requires that when mixing zones are allowed the CTR criteria apply at the edge of the mixing zone, otherwise the criteria apply throughout the water body including at the point of discharge.⁴ The CTR

¹ 40 C.F.R. §131.38(c)(4)(ii)

² 40 C.F.R. §131.38(c)(2)(iii) Table 4

³ 40 C.F.R. §131.38(c)(2)(iii) Table 4, notes 1 and 2

⁴ 40 C.F.R. §131.38(c)(2)(i)

does not define the term “ambient,” as applied in the regulations. Therefore, the Central Valley Water Board has considerable discretion to consider upstream and downstream ambient conditions when establishing the appropriate water quality criteria that fully complies with the CTR and SIP.

Summary findings

The ROWD from September 2016, did not contain hardness data for any of the water bodies of concern, Diggins Creek, Humbug Creek, or South Yuba River. However, there is a report, *Humbug Creek Watershed Assessment and Management Recommendations* (The Sierra Fund, June 2014), that contains minimal hardness data for the Pit discharge (Diggins Creek) and the ephemeral influent streams (rim runoff) that flow into the Malakoff Diggins Pit during precipitation events. See Table F-10 below. In January 2014, the Hiller Tunnel discharge was found to have a hardness of 65.9 mg/L and the influent streams had hardness values ranging from 12.6 mg/L to 19.5 mg/L. The hardness of the influent streams correlates with the ambient hardness of other local streams. The receiving water hardness for the nearby City of Nevada City ranged between 14 mg/L to 35 mg/L in Deer Creek, a tributary to the Yuba River.

Table F-8. Malakoff Diggins Pit Inflow and Outflow Hardness Values, 9 February 2014

Pit Inlet/Outlet	Site	Hardness (mg/L CaCO ₃)
Outlet	Hiller Tunnel/Diggins Creek	65.9
Influent	Rim Runoff 1	12.6
	Rim Runoff 2	19.5
	Rim Runoff 4	13.6
	Rim Runoff 5	17.6
	Rim Runoff 7	12.7
	Rim Runoff 8	13.0

The Supplemental ROWD submitted in February 2017, contained hardness data from 1 February 2017 for the effluent and Humbug Creek. Effluent hardness was reported at 31.5 mg/L and upstream Humbug Creek was reported at 16.0 mg/L. While data is limited, all monitoring indicates that ambient hardness upstream of the discharge point is very low. The actual ambient hardness of 16.0 mg/L was used in calculation of criteria for the hardness-dependent metals shown in Table F-9 below.

Table F-9. Summary of CTR Criteria for Hardness-dependent Metals

Hardness-dependent Metals	Maximum Upstream Conc. (µg/L, dissolved)	MEC (µg/L, dissolved)	CTR Criteria (µg/L, dissolved) ¹		Reasonable Potential Upstream/Effluent
			acute	chronic	
Cadmium	ND <0.04	ND <0.04	0.58	0.58	No/No
Chromium III	0.18 J	0.53 J	120	40	No/No
Copper	3.2	2.49	2.4	1.9	Yes/Yes
Lead	ND <0.078	0.11 J	8	0.33	No/No
Nickel	5.7	33	100	11	No/Yes
Silver	ND <0.025	ND <0.25	0.14	--	No/No
Zinc	ND <5.0	5.8 J	25	25	No/No

¹ Metal criteria rounded to two significant figures in accordance with the CTR (40 C.F.R. §131.38(b)(2)).

Background

The State Water Board provided direction regarding the selection of hardness in two precedential water quality orders: WQO 2008-0008 for the City of Davis Wastewater Treatment Plant (Davis Order) and WQO 2004-0013 for the Yuba City Wastewater Treatment Plant (Yuba City Order). The State Water Board recognized that the SIP and the CTR do not discuss the manner in which hardness is to be ascertained, thus regional water boards have considerable discretion in determining ambient hardness so long as the selected value is protective of water quality criteria under the given flow conditions. (Davis Order, p.10). The State Water Board explained that it is necessary that, “The [hardness] value selected should provide protection for all times of discharge under varying hardness conditions.” (Yuba City Order, p. 8). The Davis Order also provides that, “Regardless of the hardness used, the resulting limits must always be protective of water quality criteria under all flow conditions.” (Davis Order, p. 11)

The equation describing the total recoverable regulatory criterion, as established in the CTR, is as follows:

$$\text{CTR Criterion} = \text{WER} \times (e^{m[\ln(H)]+b}) \quad (\text{Equation 1})$$

Where:

H = ambient hardness (as CaCO₃)⁵

WER = water-effect ratio

m, b = metal- and criterion-specific constants

The direction provided in the CTR regarding hardness selection is that it must be based on ambient hardness and consistent with design discharge conditions for design flows and mixing zones. Consistent with design discharge conditions and design flows means that the selected “design” hardness must result in effluent limitations under design discharge conditions that do not result in more than one exceedance of the applicable criteria in a three year period.⁶ Where design flows for aquatic life criteria include the lowest one-day flow with an average reoccurrence frequency of once in ten years (1Q10) and the lowest average seven consecutive day flow with an average reoccurrence frequency of once in ten years (7Q10).

Flow data for 10 years for Diggins Creek and Humbug Creek is not available for calculation of the 1Q10 and 7Q10 flows. Since the receiving water, Humbug Creek minimum flow is zero and the maximum flow in Diggins Creek was measured at 6.5 MGD there is potential for Humbug Creek to be effluent dominated at times.

Ambient conditions

With little hardness data, the ambient receiving water hardness of 16 mg/L was selected to calculate the CTR criteria and effluent limitations that are protective under all discharge conditions for the hardness-dependent metals. See Table F-11, above.

⁵ For this discussion, all hardness values are expressed in mg/L as CaCO₃.

⁶ 40 C.F.R. §131.38(c)(2)(iii) Table 4, notes 1 and 2

Cadmium, silver, chromium III, lead, and zinc were determined to have no reasonable potential to exceed water quality criteria. This Order contains effluent limitations for copper and nickel because the maximum dissolved effluent concentrations exceeded the criteria. The accompanying TSO R5-2017-0087 contains interim effluent limits and a schedule for compliance with the final effluent limitations for copper and nickel. Because of the proposed TMDLs for chromium III, copper, and zinc, this Order contains reopeners for chromium, copper, and zinc.

3. Determining the Need for WQBEL's

There are three known discharge points within the Park boundaries: Discharge Point 001 from the Pit, discharge from Shaft 5, and discharge from the NBT outlet. The ROWD submitted by the Discharger pertains to Discharge Point 001 from the Pit, only. While several studies of the Pit and the impact of storm discharges from the Pit to Humbug Creek have been completed and summarized in the ROWD, additional investigation of the Pit is necessary and required in this Order. Very little is known about discharge from Shaft 5 and from the NBT outlet; therefore, this Order requires complete investigation and characterization of discharge from Shaft 5 and from the NBT outlet to determine if the discharges need to be regulated under a NPDES permit. The following discussion of the need for WQBELs is for the discharge from the Pit at Discharge Point 001 only.

- a. **Constituents with Total Maximum Daily Loads (TMDLs).** Effluent limitations for pollutants with Waste Load Allocations (WLAs) are established regardless of whether or not there is reasonable potential for the pollutants to be present in the discharge at concentrations that would cause or contribute to a violation of water quality standards. The Central Valley Water Board has developed water quality-based effluent limitations for pollutants with WLAs pursuant to 40 C.F.R. section 122.44(d)(1)(vii), which does not require or contemplate a reasonable potential analysis (RPA). Similarly, the SIP at Section 1.3 recognizes that an RPA is not appropriate if a TMDL has been developed.

The receiving water, Humbug Creek, is listed as an impaired water body pursuant to section 303(d) of the 1972 CWA (the 303(d) list) for chromium, copper, iron, mercury, pH, sedimentation/siltation, and zinc. A TMDL has been completed for sedimentation/siltation, but there are no WLAs. The remaining constituents have been scheduled for TMDLs. Without WLAs and TMDLs, and with very little flow data, mass limits cannot be established. This Order contains reopeners for chromium, copper, iron, mercury, pH, and zinc, should new TMDLs be adopted. This Order contains BMPs in lieu of effluent limitations for sedimentation/siltation and turbidity.

- b. **Constituents with No Reasonable Potential.** WQBEL's are not included in this Order for constituents that do not demonstrate reasonable potential (i.e. constituents were not detected in the effluent or receiving water); however, monitoring for those pollutants is established in this Order as required by the SIP. If the results of effluent monitoring demonstrate reasonable potential, this Order may be reopened and modified by adding an appropriate effluent limitation.

Most constituents with no reasonable potential are not discussed in this Order. However, the following constituents (aluminum, arsenic, cadmium, chromium III, total chromium, iron, lead, salinity (EC), silver, and zinc) were found to have no reasonable potential after assessment of the data and are discussed below:

i. **Aluminum**

Aluminum is the third most abundant element in the earth's crust and is ubiquitous in both soils and aquatic sediments. When mobilized in surface waters, aluminum has been shown to be toxic to various fish species. However, the potential for aluminum toxicity in surface waters is directly related to the chemical form of aluminum present, and the chemical form is highly dependent on water quality characteristics that ultimately determine the mechanism of aluminum toxicity. Surface water characteristics, including pH, temperature, colloidal material, fluoride and sulfate concentrations, and total organic carbon, all influence aluminum speciation and its subsequent bioavailability to aquatic life. Calcium [hardness] concentrations in surface water may also reduce aluminum toxicity by competing with monomeric aluminum (Al^{3+}) binding to negatively charged fish gills.

- (a) **WQO.** State of California Department of Public Health (DPH) has established Secondary Maximum Contaminant Levels (MCLs) to assist public drinking water systems in managing their drinking water for aesthetic conditions such as taste, color, and odor. The Secondary MCL for aluminum is 200 $\mu\text{g/L}$ for protection of the MUN beneficial use. California Code of Regulations, Title 22, requires compliance with Secondary MCLs on an annual average basis.

The Title 40, Code of Federal Regulations, promulgated criteria for priority toxic pollutants for California's surface waters as part of section 131.38 Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California (California Toxics Rule or CTR), including metals criteria. However, aluminum criteria were not promulgated as part of the CTR. Absent numeric aquatic life criteria for aluminum, WQBEL's in the Central Valley Region's NPDES permits are based on the Basin Plans' narrative toxicity objective. The Basin Plans' *Policy for Application of Water Quality Objectives* requires the Central Valley Water Board to consider, "on a case-by-case basis, direct evidence of beneficial use impacts, all material and relevant information submitted by the discharger and other interested parties, and relevant numerical criteria and guidelines developed and/or published by other agencies and organizations. In considering such criteria, the Board evaluates whether the specific numerical criteria which are available through these sources and through other information supplied to the Board, are relevant and appropriate to the situation at hand and, therefore, should be used in determining compliance with the narrative objective." Relevant information includes, but is not limited to (1) USEPA Ambient Water Quality Criteria (NAWQC) and subsequent Correction, (2) site-specific conditions of Humbug Creek, the receiving water, and (3) site-specific aluminum studies conducted by dischargers within the Central Valley Region. (Basin Plan, p. IV.-17.00; see also, 40 CFR 122.44(d)(vi).)

USEPA NAWQC. USEPA recommended the NAWQC aluminum acute criterion at 750 $\mu\text{g/L}$ based on test waters with a pH of 6.5 to 9.0. USEPA also recommended the NAWQC aluminum chronic criterion at 87 $\mu\text{g/L}$ based upon the following two toxicity tests. All test waters contained hardness at 12 mg/L as CaCO_3 .

- (1) Acute toxicity tests at various aluminum doses were conducted in various acidic waters (pH 6.0 – 6.5) on 159- and 160-day old striped bass. The 159-day old striped bass showed no mortality in waters with pH at 6.5 and aluminum doses at 390 µg/L, and the 160-day old striped bass showed 58% mortality at a dose of 174.4 µg/L in same pH waters. However, the 160-day old striped bass showed 98% mortality at aluminum dose of 87.2 µg/L in waters with pH at 6.0, which is USEPA’s basis for the 87 µg/L chronic criterion. The varied results draw into question this study and the applicability of the NAWQC chronic criterion of 87 µg/L.
- (2) Chronic toxicity effects on 60-day old brook trout were evaluated in circumneutral pH waters (6.5-6.9 pH) in five cells at various aluminum doses (4, 57, 88, 169, and 350 µg/L). Chronic evaluation started upon hatching of eyed eggs of brook trout, and their weight and length were measure after 45 days and 60 days. The 60-day old brook trout showed 24% weight loss at 169 µg/L of aluminum and 4% weight loss at 88 µg/L of aluminum, which is the basis for USEPA’s chronic criteria. Though this test study shows chronic toxic effects of 4% reduction in weight after exposure for 60-days, the chronic criterion is based on 4-day exposure; so again, the applicability of the NAWQC chronic criterion of 87 µg/L is questionable.

Site-specific Conditions. USEPA advises that a water effects ratio may be more appropriate to better reflect the actual toxicity of aluminum to aquatic organisms when the pH and hardness conditions of the receiving water are not similar to that of the test conditions.⁷ Effluent (i.e., Diggins Creek) and Humbug Creek monitoring data indicate that the pH and hardness values are similar, at times, to the low pH and hardness conditions under which the chronic criterion for aluminum was developed, as shown in the table below, and therefore, the Central Valley Water Board assumes that aluminum may be as toxic in Humbug Creek as in the previously described toxicity tests, when pH and hardness conditions are similar. The estimated pH of Humbug Creek, the receiving water, ranged from 5.92 to 9.31. The hardness of Humbug Creek ranged from 13 mg/L to 20 mg/L, based on samples collected in February 2014 and February 2017.

Table F-10. Comparison of Test Conditions to Effluent and Receiving Water Aluminum

Parameter	Units	Test Conditions for Applicability of Chronic Criterion	Effluent	Receiving Water
pH	standard units	6.0 – 6.5	5.92 – 9.31	(5.92 – 9.31) Estimated
Hardness, Total (as CaCO ₃)	mg/L	12	65.9	13
Aluminum, Total Recoverable	µg/L	87.2 – 390	26,900	1,200

Local Environmental Conditions and Studies. Twenty-one site-specific aluminum toxicity tests have been conducted within the Central Valley

⁷ “The value of 87 micro-g/L is based on a toxicity test with striped bass in water with pH = 6.5-6.6 and hardness < 10 mg/L. Data in [a 1994 Study] indicate that aluminum is substantially less toxic at higher pH and hardness, but the effects of pH and hardness are not well quantified at this time.” USEPA 1999 NAWQC Correction, Footnote L

Region. The estimated pH and hardness of Humbug Creek are similar to the results for the City of Auburn, as shown in the table below, and thus the results of these site-specific aluminum toxicity tests are relevant and appropriate for Humbug Creek. As shown in the following table, all EC₅₀⁸ toxicity study result values are at concentrations of aluminum above 5,000 µg/L. Thus, the toxic effects of aluminum in these surface waters and in Humbug Creek, are less toxic (or less reactive) to aquatic species than demonstrated in the toxicity tests that USEPA used for the basis of establishing the chronic criterion of 87 µg/L. This new information indicates that 87 µg/L is overly stringent and not applicable to Humbug Creek.

Table F-11. Central Valley Region Site-Specific Aluminum Toxicity Data

Discharger	Test Waters	Hardness Value	Total Aluminum EC ₅₀ Value	pH	WER
<i>Oncorhynchus mykiss</i> (rainbow trout)					
Manteca	Surface Water/Effluent	124	>8600	9.14	N/C
Auburn	Surface Water	16	>16500	7.44	N/C
Modesto	Surface Water/Effluent	120/156	>34250	8.96	>229
Yuba City	Surface Water/Effluent	114/164 ¹	>8000	7.60/7.46	>53.5
<i>Ceriodaphnia dubia</i> (water flea)					
Auburn	Effluent	99	>5270	7.44	>19.3
	Surface Water	16	>5160	7.44	>12.4
Manteca	Surface Water/Effluent	124	>8800	9.14	N/C
	Effluent	117	>8700	7.21	>27.8
	Surface Water	57	7823	7.58	25.0
	Effluent	139	>9500	7.97	>21.2
	Surface Water	104	>11000	8.28	>24.5
	Effluent	128	>9700	7.78	>25.0
	Surface Water	85	>9450	7.85	>25.7
	Effluent	106	>11900	7.66	>15.3
	Surface Water	146	>10650	7.81	>13.7
Modesto	Surface Water/Effluent	120/156	31604	8.96	211
Yuba City	Surface Water/Effluent	114/164 ¹	>8000	7.60/7.46	>53.5
Placer County (SMD 1)	Effluent	150	>5000	7.4 – 8.7	>13.7
<i>Daphnia magna</i> (water flea)					
Manteca	Surface Water/Effluent	124	>8350	9.14	N/C
Modesto	Surface Water/Effluent	120/156	>11900	8.96	>79.6
Yuba City	Surface Water/Effluent	114/164 ¹	>8000	7.60/7.46	>53.5

The Discharger has not conducted a toxicity test for aluminum; however, the City of Auburn conducted toxicity tests in Auburn Ravine. As shown, the test water quality characteristics of Auburn Ravine near Auburn are similar for pH and hardness in Humbug Creek, with the hardness of 16 mg/L as CaCO₃ in comparison to the hardness of Humbug Creek near

⁸ The effect concentration is a point estimate of the toxicant concentration that would cause an observable adverse effect (e.g. death, immobilization, or serious incapacitation) in a given percent of the test organisms, calculated from a continuous model (e.g. Probit Model). EC₅₀ is a point estimate of the toxicant concentration that would cause an observable adverse effect in 50 percent of the test organisms. The EC₅₀ is used in toxicity testing to determine the appropriate chronic criterion.

the discharge with a minimum of 13 mg/L as CaCO₃. Thus, results of the site-specific study conducted on Auburn Ravine near Auburn are representative of Humbug Creek near the discharge. Therefore, the City of Auburn aluminum toxicity test study is relevant for use in determining the specific numerical criteria to be used in determining compliance with the Basin Plan's narrative toxicity objective. The City of Auburn aluminum toxicity study resulted in a minimum site-specific aluminum objective of 5,160 µg/L. Thus, these results support the conclusion that the 87 µg/L chronic criterion is overly stringent for Humbug Creek near the discharge.

Applicable WQOs. This Order implements the Secondary MCL of 200 µg/L as an annual average for the protection of MUN and implements the Basin Plan's narrative toxicity objective for the protection of aquatic life using an acute (1-hour) criterion of 750 µg/L based on USEPA's NAWQC and the discussion above.

- (b) **RPA Results.** Between October 2011 and February 2017, out of 15 samples, the maximum effluent concentration as dissolved concentrations of aluminum were 120 µg/L in the effluent and 39 µg/L in the upstream receiving water. The maximum dissolved effluent concentration does not exceed the criterion. Therefore, dissolved aluminum in the discharge does not have a reasonable potential to cause or contribute to an in-stream excursion above the secondary MCL and effluent limitations are not included in this Order for aluminum. Monitoring for aluminum is required by the MRP.

ii. **Arsenic**

- (a) **WQO.** The Primary MCL for arsenic is 10 µg/L, which is used to implement the Basin Plan's chemical constituent objective for the protection of municipal and domestic supply.
- (b) **RPA Results.** Between October 2011 and February 2017, out of 17 samples, the maximum effluent concentration for arsenic was 7.2 µg/L while the maximum observed upstream receiving water concentration was 0.35 µg/L. The maximum effluent concentration did not exceed the Primary MCL of 10 µg/L. Therefore, arsenic in the discharge does not have reasonable potential to cause or contribute to an in-stream excursion above the criterion and effluent limitations for arsenic are not included in this Order. Monitoring for arsenic is required by the MRP.

iii. **Cadmium**

- (a) **WQO.** The CTR includes hardness dependent criteria for the protection of freshwater aquatic life for cadmium. Using the default conversion factors and reasonable worst-case measured hardness (16 mg/L as CaCO₃) as described in section IV.C.2.e of the Fact Sheet, for dissolved cadmium, the applicable acute (1-hour average) and chronic (4-day average) criteria for the effluent are 0.58 µg/L and 0.58 µg/L, respectively.
- (b) **RPA Results.** Between October 2011 and February 2017, 9 effluent samples were collected for analysis of dissolved cadmium.

As shown in Table F-12, below, the MEC for dissolved cadmium was ND with an MDL of 0.04 µg/L. The upstream receiving water concentration for dissolved cadmium was also ND with an MDL of 0.04 µg/L. Dissolved

concentrations of cadmium in the effluent and the receiving water did not exceed the criterion.

Dissolved cadmium does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the CTR criterion of 0.58 µg/L, and WQBEL's for cadmium have not been established in this Order.

Table F-12. Cadmium CTR Criteria and RPA

CTR Acute Criterion	CTR Chronic Criterion	Maximum Effluent Concentration	Maximum Receiving Water Concentration	Reasonable Potential? Effluent/Rec Water
0.58 µg/L ¹	0.58 µg/L ¹	ND at 0.04 µg/L	ND at 0.04 µg/L	No/No ²

¹ Based on lowest observed hardness of 16 mg/L (as CaCO₃)

² Per Section 1.3, step 6 of the SIP.

iv. **Chromium (III)**

- (a) **WQO.** The CTR includes hardness dependent criteria for the protection of freshwater aquatic life for chromium III. Using the default conversion factors and reasonable worst-case measured hardness (16 mg/L CaCO₃) as described in section IV.C.2.e, the applicable acute (1-hour average) and chronic (4-day average) criteria for the effluent are 120 µg/L and 40 µg/L, respectively.

Humbug Creek is 303(d) listed as an impaired water body due to chromium. TMDLs for chromium in Humbug Creek have not yet been scheduled for completion. Reopeners have been included in this Order for chromium.

- (b) **RPA Results.** This Order requires monitoring for total chromium in lieu of monitoring for chromium III. 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. However, due to the difficulty of monitoring for chromium III, monitoring for total chromium is required instead.

Between October 2011 and February 2017, 11 samples were analyzed for dissolved chromium. As shown in Table F-13, below, the maximum effluent concentration of dissolved chromium was 0.33 µg/L. The maximum observed upstream receiving water concentration was detected but not quantified at an estimated 0.18 µg/L (known as a J Flag). The effluent concentrations of dissolved chromium did not exceed the criterion. The receiving water concentrations of dissolved chromium did not exceed the criterion.

Dissolved chromium in the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the criterion of 40 µg/L. WQBEL's for chromium have not been established in this Order.

Table F-13. Chromium III CTR Criteria and RPA

CTR Acute Criterion	CTR Chronic Criterion	Maximum Effluent Concentration	Maximum Receiving Water Concentration	Reasonable Potential? Effluent/Rec Water
120 µg/L ¹	40 µg/L ¹	0.33 µg/L	0.18 J µg/L	No/No ²

¹ Based on lowest observed hardness of 16 mg/L (as CaCO₃)

² Per Section 1.3, step 6 of the SIP.

v. **Chromium, Total**

- (a) **WQO.** The California Department of Public Health has adopted a Primary MCL for total chromium of 50 µg/L, which implements the Basin Plan’s chemical constituent objective.

Humbug Creek is 303(d) listed as an impaired water body due to chromium. TMDLs for chromium in Humbug Creek have not yet been scheduled for completion. Reopeners have been included in this Order for chromium.

- (b) **RPA Results.** Between October 2011 and February 2017, out of 17 samples, the MEC for total chromium, as dissolved, was 0.33 µg/L while the maximum observed upstream receiving water concentration was 1.3 µg/L. Therefore, total chromium in the discharge does not have reasonable potential to cause or contribute to an in-stream excursion above the criterion and effluent limitations for total chromium are not included in this Order. Monitoring for Total Chromium is required in the MRP.

vi. **Iron**

- (a) **WQO.** The Secondary MCL – Consumer Acceptance Limit for iron is 300 µg/L, which is used to implement the Basin Plan’s chemical constituent objective for the protection of municipal and domestic supply.

Humbug Creek is 303(d) listed as an impaired water body due to iron. TMDLs for iron in Humbug Creek and South Yuba River have not yet been scheduled for completion. A reopener has been included in this Order for iron.

- (b) **RPA Results.** Between October 2011 and February 2017, out of 17 samples, the maximum effluent concentration for iron was 160 µg/L, which is below the Secondary MCL. Therefore, iron in the discharge does not have reasonable potential to cause or contribute to an in-stream excursion above the criterion and effluent limitations for iron are not included in this Order.

vii. **Lead**

- (a) **WQO.** The CTR includes hardness dependent criteria for the protection of freshwater aquatic life for lead. Using the default conversion factors and reasonable worst-case measured hardness (16 mg/L CaCO₃) as described in section IV.C.2.e, the applicable acute (1-hour average) and chronic (4-day average) criteria for the effluent are 8.4 µg/L and 0.33 µg/L, respectively, as dissolved lead.

- (b) **RPA Results.** Between October 2011 and February 2017, 9 effluent samples were collected for analysis of dissolved lead. As shown in Table

F-14, below, the maximum effluent concentration of dissolved lead was detected but not quantified at an estimated 0.11 µg/L (a J Flag). The maximum observed upstream receiving water concentration was ND with an MDL of 0.078 µg/L. The effluent concentrations of dissolved lead did not exceed the criteria. The receiving water concentrations of dissolved lead did not exceed the criteria.

Dissolved lead in the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the criterion of 0.33 µg/L. WQBEL's for lead have not been established in this Order.

Table F-14. Lead CTR Criteria and RPA

CTR Acute Criterion	CTR Chronic Criterion	Maximum Effluent Concentration	Maximum Receiving Water Concentration	Reasonable Potential? Effluent/Rec Water
8.4 µg/L ¹	0.33 µg/L ¹	0.11 µg/L J	ND at 0.078 µg/L	No/No ²

¹ Based on lowest observed hardness of 16 mg/L (as CaCO₃)

² Per Section 1.3, step 6 of the SIP.

viii. **Salinity**

- (a) **WQO.** The Basin Plan contains a chemical constituent objective that incorporates state MCLs, contains a narrative objective, and contains numeric water quality objectives for certain specified water bodies for electrical conductivity, total dissolved solids, sulfate, and chloride. The USEPA Ambient Water Quality Criteria for Chloride recommends acute and chronic criteria for the protection of aquatic life. There are no USEPA water quality criteria for the protection of aquatic life for electrical conductivity, total dissolved solids, and sulfate. Additionally, there are no USEPA numeric water quality criteria for the protection of agricultural, livestock, and industrial uses. Numeric values for the protection of these uses are typically based on site specific conditions and evaluations to determine the appropriate constituent threshold necessary to interpret the narrative chemical constituent Basin Plan objective. The Central Valley Water Board must determine the applicable numeric limit to implement the narrative objective for the protection of agricultural supply. The Central Valley Water Board is currently implementing the CV-SALTS initiative to develop a Basin Plan Amendment that will establish a salt and nitrate Management Plan for the Central Valley. Through this effort the Basin Plan will be amended to define how the narrative water quality objective is to be interpreted for the protection of agricultural use. All studies conducted through this Order to establish an agricultural limit to implement the narrative objective will be reviewed by and consistent with the efforts currently underway by CV-SALTS.

Table F-15. Salinity Water Quality Criteria/Objectives

Parameter	Agricultural WQ Objective ¹	Secondary MCL ²	USEPA NAWQC	Effluent	
				Average	Maximum
EC (µmhos/cm)	Varies ²	900, 1600, 2200	N/A	0.24	1.8
TDS (mg/L)	Varies	500, 1000, 1500	N/A	Not sampled	Not sampled

Sulfate (mg/L)	Varies	250, 500, 600	N/A	Not sampled	Not sampled
Chloride (mg/L)	Varies	250, 500, 600	860 1-hr 230 4-day	Not sampled	Not sampled

¹ Narrative chemical constituent objective of the Basin Plan. Procedures for establishing the applicable numeric limitation to implement the narrative objective can be found in the Policy for Application of Water Quality, Chapter IV, Section 8 of the Basin Plan. However, the Basin Plan does not require improvement over naturally occurring background concentrations. In cases where the natural background concentration of a particular constituent exceeds an applicable water quality objective, the natural background concentration will be considered to comply with the objective.

² The secondary MCLs are stated as a recommended level, upper level, and a short-term maximum level.

- (1) **Chloride.** The Secondary MCL for chloride is 250 mg/L, as a recommended level, 500 mg/L as an upper level, and 600 mg/L as a short-term maximum
- (2) **Electrical Conductivity.** The Secondary MCL for EC is 900 µmhos/cm as a recommended level, 1600 µmhos/cm as an upper level, and 2200 µmhos/cm as a short-term maximum.
- (3) **Sulfate.** The Secondary MCL for sulfate is 250 mg/L as a recommended level, 500 mg/L as an upper level, and 600 mg/L as a short-term maximum.
- (4) **Total Dissolved Solids.** The Secondary MCL for TDS is 500 mg/L as a recommended level, 1000 mg/L as an upper level, and 1500 mg/L as a short-term maximum.

(b) **RPA Results.**

- (1) **Chloride.** Chloride was not sampled. Chloride will be sampled and analyzed under the Effluent and Receiving Water Characterization Study.
- (2) **Electrical Conductivity.** Six EC monitoring events were conducted between November 2016 and January 2017. EC in the effluent had a range of 40.6 µmho/cm to 131 µmho/cm and EC in the upstream receiving water (Humbug Creek) had a range of 18.5 µmho/cm to 148 µmho/cm. All EC values were below the criteria. Therefore, this Order does not contain effluent limitations for EC. This Order does contain effluent and receiving water monitoring requirements for EC.
- (3) **Sulfate.** Sulfate was not sampled. Sulfate will be sampled and analyzed under the Effluent and Receiving Water Characterization Study.
- (4) **Total Dissolved Solids.** TDS was not sampled. All EC values were below the criteria. Therefore, this Order does not contain effluent limitations for EC or TDS. Effluent and receiving water Monitoring for EC is required in this Order and is sufficient to determine salinity in the discharge.

ix. **Silver**

- (a) **WQO.** The CTR includes hardness dependent criteria for the protection of freshwater aquatic life for silver. Using the default conversion factors and reasonable worst-case measured hardness as described in section IV.C.2.e, the applicable acute (instantaneous maximum) criterion for the effluent is 0.16 µg/L, as total recoverable silver and 0.14 µg/L as dissolved.
- (b) **RPA Results.** Between October 2011 and February 2017, 9 effluent samples were collected for analysis of dissolved silver. As shown in Table F-16, below, the maximum effluent concentration of dissolved silver was ND with an MDL of 0.025 µg/L. The maximum observed upstream receiving water concentration was also ND with an MDL of 0.025 µg/L. Dissolved concentrations of silver in the effluent and the receiving water did not exceed the criteria

Dissolved silver in the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the criterion of 0.14 µg/L. WQBEL’s for silver have not been established in this Order.

Table F-16. Silver CTR Criteria and RPA

CTR Instantaneous Maximum	Maximum Effluent Concentration	Maximum Receiving Water Concentration	Reasonable Potential? Effluent/Rec Water
0.14 µg/L ¹	ND at 0.25 µg/L	ND at 0.025 µg/L	No/No ²

¹ Based on lowest observed hardness of 16 mg/L (as CaCO₃)
² Per Section 1.3, step 6 of the SIP.

x. **Zinc**

- (a) **WQO.** The CTR includes hardness dependent criteria for the protection of freshwater aquatic life for zinc. Using the default conversion factors and reasonable worst-case measured hardness (16 mg/L CaCO₃) as described in section IV.C.2.d, the applicable acute (1-hour average) and chronic (4-day average) criteria for the effluent are both 25 µg/L, as dissolved zinc.

Humbug Creek is 303(d) listed as an impaired water body due to zinc. A TMDL for zinc in Humbug Creek is scheduled for completion in 2020. A reopener for zinc is included in this Order.

- (b) **RPA Results.** Between October 2011 and February 2017, 12 effluent samples were collected for analysis of dissolved zinc. As shown in Table F-17, below, the maximum effluent concentration of dissolved zinc was detected but not quantified at an estimated 5.8 µg/L (known as a J Flag). The maximum observed upstream receiving water concentration was ND with an MDL of 5.0 µg/L. The maximum effluent and receiving water concentrations of dissolved zinc does not exceed the respective criteria.

Dissolved zinc in the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the criterion of 25 µg/L. Therefore, WQBEL’s for zinc have not been established in this Order.

Table F-17. Zinc CTR Criteria and RPA

CTR Acute Criterion	CTR Chronic Criterion	Maximum Effluent Concentration	Maximum Receiving Water Concentration	Reasonable Potential? Effluent/Rec Water
25 µg/L ¹	25 µg/L ¹	5.8 µg/L J	ND at 5.0 µg/L	No/No ²

¹ Based on lowest observed hardness of 16 mg/L (as CaCO₃)

² Per Section 1.3, step 6 of the SIP.

- c. **Constituents with Reasonable Potential.** The Central Valley Water Board finds that the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for copper, manganese, mercury, nickel, pH, and turbidity. WQBEL's for copper, manganese, mercury, nickel, and pH are included in this Order. BMP's are required in lieu of numeric effluent limitations for turbidity. A summary of the RPA is provided in Attachment G, and a detailed discussion of the RPA for each constituent is provided below.

i. **Copper**

- (a) **WQO.** The CTR includes hardness dependent criteria for the protection of freshwater aquatic life for copper. Using the default conversion factors and reasonable worst-case measured hardness (16 mg/L CaCO₃) as described in section IV.C.2.e, the applicable acute (1-hour average) and chronic (4-day average) criteria for the effluent are 2.4 µg/L and 1.9 µg/L, respectively, as dissolved copper.

Humbug Creek and South Yuba River are 303(d) listed as impaired water bodies due to copper. A TMDL for copper in Humbug Creek is scheduled for completion in 2020. Reopeners for copper are included in this Order.

- (b) **RPA Results.** Between October 2011 and February 2017, 9 samples were collected for analysis of dissolved copper. As shown in Table F-18, below, the maximum effluent concentration of dissolved copper was 2.5 µg/L. The maximum observed upstream receiving water concentration was 3.2 µg/L. The effluent concentrations of dissolved copper exceeded the acute and chronic criteria. The receiving water concentrations of dissolved copper also exceeded the criteria.

Dissolved copper in the discharge demonstrates reasonable potential to cause or contribute to an in-stream excursion above the acute and chronic criteria. The receiving water concentration of copper exceeds the criteria as well. WQBEL's for copper have been established and this Order contains a final average monthly effluent limitation (AMEL) and a maximum daily effluent limitation (MDEL) for copper of 0.92 µg/L and 2.5 µg/L, respectively.

Table F-18. Copper CTR Criteria and RPA

CTR Acute Criterion	CTR Chronic Criterion	Maximum Effluent Concentration	Maximum Receiving Water Concentration	Reasonable Potential? Effluent/Rec Water
2.4 µg/L ¹	1.9 µg/L ¹	2.5 µg/L	3.2 µg/L	Yes/Yes ²

¹ Based on lowest observed hardness of 16 mg/L (as CaCO₃)

² Per Section 1.3, step 6 of the SIP.

- (c) **WQBEL's.** Board staff has determined that Humbug Creek is at times effluent dominated and that there is no assimilative capacity available. In addition, the concentration of copper in Humbug Creek upstream of the discharge exceeds the criteria. Due to no assimilative capacity, dilution credits are not allowed for development of the WQBEL's for copper. This Order contains a final average monthly effluent limitation (AMEL) of 0.92 µg/L and a maximum daily effluent limitation (MDEL) of 2.5 µg/L for copper based on the CTR criteria.
- (d) **Plant Performance and Attainability.** Analysis of the effluent data shows that the MEC of 2.5 µg/L is greater than applicable WQBEL's. Based on the sample results for the effluent, the limitations appear to put the Discharger in immediate non-compliance. New or modified control measures may be necessary in order to comply with the effluent limitations, and the new or modified control measures cannot be designed, installed and put into operation within 30 calendar days. Furthermore, the effluent limitations for copper are a new regulatory requirement within this permit, which becomes applicable to the waste discharge with the adoption of this Order, which was adopted after 1 July 2000. Therefore, a time schedule for compliance with the copper effluent limitations is established in TSO R5-2017-0087 in accordance with Water Code section 13300 that requires preparation and implementation of a pollution prevention plan in compliance with Water Code section 13263.3.

ii. **Manganese**

- (a) **WQO.** The Secondary MCL – Consumer Acceptance Limit for manganese is 50 µg/L, which is used to implement the Basin Plan's chemical constituent objective for the protection of municipal and domestic supply.
- (b) **RPA Results.** Between October 2011 and February 2017, out of 22 samples, maximum dissolved concentration of manganese in the effluent was 410 µg/L, which exceeds the Secondary MCL. Therefore, manganese in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Secondary MCL.
- (c) **WQBELs.** Board staff has determined that Humbug Creek is at times effluent dominated and that there is no assimilative capacity available. Due to no assimilative capacity, dilution credits are not allowed for development of the WQBEL's for manganese. This Order contains a final average monthly effluent limitation (AMEL) and an average weekly effluent limitation (AWEL) for manganese of 87 µg/L and 200 µg/L, respectively.
- (d) **Plant Performance and Attainability.** Analysis of the effluent data shows that the MEC of 410 µg/L is greater than applicable WQBEL's. Based on the sample results for the effluent, the limitations appear to put the Discharger in immediate non-compliance. New or modified control measures may be necessary in order to comply with the effluent limitations, and the new or modified control measures cannot be designed, installed and put into operation within 30 calendar days. Furthermore, the effluent limitations for manganese are a new regulatory requirement within this permit, which becomes applicable to the waste discharge with the adoption of this Order, which was adopted after 1 July 2000. Therefore,

interim limitations and a compliance time schedule for compliance with the final manganese effluent limitations is included in this Order.

iii. **Mercury**

Mercury exists in three forms that have different properties, usage, and toxicity. The three forms are elemental (or metallic) mercury, which may occur in both liquid and gaseous states, inorganic mercury compounds, and organic mercury compounds.

Elemental mercury is liquid at room temperature. Inorganic mercury compounds are formed when mercury combines with other elements, such as sulfur or oxygen, to form compounds or salts. Organic mercury compounds are formed when mercury combines with carbon. Microscopic organisms in water and soil can convert elemental and inorganic mercury into an organic mercury compound, methylmercury, which accumulates in the food chain.

Methylation is a product of complex processes that move and transform mercury. Atmospheric deposition contains the three principal forms of mercury, although inorganic divalent mercury (HgII) is the dominant form. Once in surface water, mercury enters a complex cycle in which one form can be converted to another. Mercury attached to particles can settle onto the sediments where it can diffuse into the water column, be resuspended, be buried by other sediments, or be methylated. Methylmercury can enter the food chain, or it can be released back to the atmosphere by volatilization.

Methylmercury production in inland ecosystems has been primarily attributed to anaerobic bacteria in the sediment. However, strong associations between methylmercury, nutrients and organic matter remineralization suggest water column production of methylmercury during carbon remineralization. (Remineralization relates to the cycling of the major biologically-important elements such as carbon, nitrogen and phosphorus.)

The concentration of dissolved organic carbon (DOC) and pH have a strong effect on the ultimate fate of mercury in an ecosystem. Studies have shown that increasing the acidity of the water (decreasing pH) and/or the DOC content generally results in higher mercury levels in fish, an indicator of greater net methylation. Higher acidity and DOC levels enhance the mobility of mercury in the environment, thus making it more likely to enter the food chain.

Mercury and methylmercury exposure to sunlight (specifically ultra-violet light) has an overall detoxifying effect. Sunlight can break down methylmercury to Hg(II) or Hg(0), which can leave the aquatic environment and reenter the atmosphere as a gas.

Large quantities of elemental mercury were used in the hydraulic mining process for gold ore recovery at Malakoff Diggins. Much of the residual mercury remained onsite adsorbed to sediment particles. Erosion and sediment transport by surface water flow causes release of mercury and sediment particles into Diggins Creek and from there it may be transported to the receiving water, Humbug Creek, and downstream waters.

- (a) **WQO.** The current NAWQC for protection of freshwater aquatic life, continuous concentration, for mercury is 0.77 µg/L (30-day average, chronic criterion). The CTR contains a human health criterion (based on a threshold dose level causing neurological effects in infants) of 0.050 µg/L

for waters from which both water and aquatic organisms are consumed. Both values are controversial and subject to change. In 40 C.F.R. part 131, USEPA acknowledges that the human health criteria may not be protective of some aquatic or endangered species and that “...more stringent mercury limits may be determined and implemented through use of the State’s narrative criterion.” In the CTR, USEPA reserved the mercury criteria for freshwater and aquatic life and may adopt new criteria at a later date.

The current NAWQC for human health protection for methylmercury is 0.3 mg/kg from consumption of water and fish.

Humbug Creek is 303(d) listed as an impaired water body due to mercury. TMDLs for mercury in Humbug Creek is scheduled for completion in 2021. Reopeners are included in this Order for mercury.

- (b) **RPA Results.** The maximum observed total recoverable effluent mercury concentration was 0.74 µg/L, which exceeds the CTR criterion. The maximum observed upstream receiving water concentration was detected but not quantified at an estimated 0.016 µg/L (known as a J Flag). Mercury bioaccumulates in fish tissue and, therefore, the discharge of mercury to the receiving water may contribute to exceedances of the narrative toxicity objective and impact beneficial uses. Humbug Creek has been listed as an impaired water body pursuant to CWA section 303(d) because of mercury and the discharge must not cause or contribute to increased mercury levels. It is impractical to monitor on a regular basis for methylmercury in fish tissue. Therefore, this Order contains water quality based effluent limitations for concentration of total mercury based on the RPA conducted on the discharge from the Pit.
- (c) **WQBEL’s.** Board staff has determined that Humbug Creek is at times effluent dominated and that there is no assimilative capacity available. Due to no assimilative capacity, dilution credits are not allowed for development of the WQBEL’s for mercury. This Order contains a final average monthly effluent limitation (AMEL) and a maximum daily effluent limitation (MDEL) for mercury of 0.050 µg/L and 0.14 µg/L, respectively, based on the CTR human health criterion of 0.050 µg/L.
- (d) **Plant Performance and Attainability.** Analysis of the effluent data shows that the MEC of 0.74 µg/L is greater than applicable WQBEL’s. Based on the sample results for the effluent, the limitations appear to put the Discharger in immediate non-compliance. New or modified control measures may be necessary in order to comply with the effluent limitations, and the new or modified control measures cannot be designed, installed and put into operation within 30 calendar days. Furthermore, the effluent limitations for mercury are a new regulatory requirement within this permit, which becomes applicable to the waste discharge with the adoption of this Order, which was adopted after 1 July 2000. Therefore, a compliance time schedule for compliance with the mercury effluent limitations is established in TSO R5-2017-0087 in accordance with Water Code section 13300 that requires preparation and implementation of a pollution prevention plan in compliance with Water Code section 13263.3.

iv. **Nickel**

(a) **WQO.** The CTR includes hardness dependent criteria for the protection of freshwater aquatic life for nickel. Using the default conversion factors and reasonable worst-case measured hardness (16 mg/L CaCO₃) as described in section IV.C.2.e, the applicable acute (1-hour average) and chronic (4-day average) criteria for the effluent are 100 µg/L and 11 µg/L, respectively, as dissolved nickel.

Humbug Creek is 303(d) listed as an impaired water body due to nickel. TMDLs for nickel in Humbug Creek have not yet been scheduled for completion. Reopeners have been included in this Order for nickel.

(b) **RPA Results.** Between October 2011 and February 2017, 12 effluent samples were collected for analysis of dissolved nickel. As shown in Table F-19, below, the maximum effluent concentration of dissolved nickel was 33 µg/L. The maximum observed upstream receiving water concentration was 5.7 µg/L. The maximum effluent concentration of dissolved nickel exceeds the chronic criterion. The receiving water concentrations of dissolved nickel did not exceed the criterion.

Dissolved nickel in the discharge demonstrates reasonable potential to cause or contribute to an in-stream excursion above the chronic criterion of 11 µg/L. WQBEL's for nickel have been established and this Order contains a final average monthly effluent limitation (AMEL) and a maximum daily effluent limitation (MDEL) for nickel of 8.6 µg/L and 19 µg/L, respectively

Table F-19. Nickel CTR Criteria and RPA

CTR Acute Criterion	CTR Chronic Criterion	Maximum Effluent Concentration	Maximum Receiving Water Concentration	Reasonable Potential? Effluent/Rec Water
100 µg/L ¹	11 µg/L ¹	33 µg/L	5.7 µg/L	Yes/No ²

¹ Based on lowest observed hardness of 16 mg/L (as CaCO₃)

² Per Section 1.3, step 6 of the SIP.

- (c) **WQBEL's.** Board staff has determined that Humbug Creek is at times effluent dominated and that there is no assimilative capacity available. Due to no assimilative capacity, dilution credits are not allowed for development of the WQBEL's for nickel. This Order contains a final average monthly effluent limitation (AMEL) and a maximum daily effluent limitation (MDEL) for nickel of 8.6 µg/L and 19 µg/L, respectively.
- (d) **Plant Performance and Attainability.** Analysis of the effluent data shows that the MEC of 33 µg/L is greater than applicable WQBEL's. Based on the sample results for the effluent, the limitations appear to put the Discharger in immediate non-compliance. New or modified control measures may be necessary in order to comply with the effluent limitations, and the new or modified control measures cannot be designed, installed and put into operation within 30 calendar days. Furthermore, the effluent limitations for nickel are a new regulatory requirement within this permit, which becomes applicable to the waste discharge with the adoption of this Order, which was adopted after 1 July 2000. Therefore, a compliance time schedule for compliance with the nickel effluent

limitations is established in TSO R5-2017-0087 in accordance with Water Code section 13300 that requires preparation and implementation of a pollution prevention plan in compliance with Water Code section 13263.3.

v. **pH**

- (a) **WQO.** 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.”

Humbug Creek is 303(d) listed as an impaired water body due to pH. A TMDL for pH in Humbug Creek has not yet been scheduled for completion. A reopener is included in this Order for pH.

- (b) **RPA Results.** The effluent pH ranged from 5.92 to 9.31 while the upstream receiving water pH ranged from 5.21 to 7.89 and downstream receiving water ranged from 5.13 to 7.91. The pH in the discharge exceeds the Basin Plan water quality objective, therefore the effluent has a reasonable potential to cause or contribute to an in-stream excursion outside the range of the pH objective.

Federal regulations at 40 C.F.R. §122.44(d)(1)(i) requires that, “*Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines 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.*” For priority pollutants, the SIP dictates the procedures for conducting the RPA. pH is not a priority pollutant. Therefore, the Central Valley Water Board is not restricted to one particular RPA method. Due to the site-specific conditions of the discharge, the Central Valley Water Board has used professional judgment in determining the appropriate method for conducting the RPA for this non-priority pollutant constituent.

USEPA’s September 2010 NPDES Permit Writer’s Manual, page 6-30, states, “*State implementation procedures might allow, or even require, a permit writer to determine reasonable potential through a qualitative assessment process without using available facility-specific effluent monitoring data or when such data are not available...A permitting authority might also determine that WQBEL’s are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBEL’s for pathogens in all permits for POTW’s discharging to contact recreational waters).*” USEPA’s TSD also recommends that factors other than effluent data should be considered in the RPA, “*When determining whether or not a discharge causes, has the reasonable potential to cause, or contributes to an excursion of a numeric or narrative water quality criterion for individual toxicants or for toxicity, the regulatory authority can use a variety of factors and information where facility-specific effluent monitoring data are unavailable. These factors also should be considered with available effluent monitoring data.*” (TSD, p. 50)

The Pit discharges storm water runoff to Diggins Creek (effluent). Based on 34 samples taken from October 2011 to March 2016, the maximum pH reported was 9.31 and the minimum was 5.92. The discharge exceeded

the instantaneous maximum effluent limitation one time and was lower than the instantaneous minimum effluent limitation seven times. The pH for the Pit discharge varies due to the nature of mine runoff, which provides the basis for the discharge to have a reasonable potential to cause or contribute to in-stream excursions above and below the Basin Plan's numeric objectives for pH in the receiving water. Therefore, WQBEL's for pH are required in this Order.

- (c) **WQBEL's.** Effluent limitations for pH of 6.5 as an instantaneous minimum and 8.5 as an instantaneous maximum are included in this Order based on protection of the Basin Plan objectives for pH.
- (d) **Plant Performance and Attainability.** Analysis of the effluent data shows that the minimum and maximum pH values are outside the range of applicable WQBEL's for pH. Based on the sample results for the effluent, the limitations appear to put the Discharger in immediate non-compliance. New or modified control measures may be necessary in order to comply with the effluent limitations, and the new or modified control measures cannot be designed, installed and put into operation within 30 calendar days. Furthermore, the effluent limitations for pH are a new regulatory requirement within this permit, which becomes applicable to the waste discharge with the adoption of this Order, which was adopted after 1 July 2000. Therefore, interim limitations and a compliance time schedule for compliance with the final pH effluent limitations is established in this Order.

vi. Turbidity

- (a) **WQO.** The Basin Plan includes a narrative objective for turbidity that states "[w]aters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses," and includes numeric turbidity objectives for varying receiving water conditions as follows:

Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

- Shall not exceed 2 Nephelometric Turbidity Units (NTU) where natural turbidity at RSW-001 is less than 1 NTU;
- Shall not increase more than 1 NTU where natural turbidity at RSW-001 is between 1 and 5 NTUs;
- Shall not increase more than 20 percent where natural turbidity at RSW-001 is between 5 and 50 NTUs;
- Shall not increase more than 10 NTU where natural turbidity at RSW-001 is between 50 and 100 NTUs; nor
- Shall not increase more than 10 percent where natural turbidity at RSW-001 is greater than 100 NTUs.

The Central Valley Water Board is authorized under the federal regulations (40 CFR 122.44(k)) to impose Best Management Practices (BMPs) to control or abate the discharge of pollutants in lieu of numeric effluent limitations when the Board finds that BMPs are reasonably necessary to achieve effluent limitations and standards, or to carry out the purposes and intent of the federal Clean Water Act.

The State Water Resources Control Board, in Order WQ 2009-0015 concerning the petition of WDRs Order R5-2008-0104 for Spanish Mine, has further determined that it is appropriate to include BMPs rather than numeric effluent limitations for non-priority pollutants, such as turbidity.

- (b) **RPA Results.** In 33 samples collected between January 2011 and February 2017, the MEC for turbidity was 1400 NTU. Based on monitoring data and the nature of the discharge, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan Water Quality Objective for turbidity.
- (c) **WQBELs.** The Board finds that it is not feasible to develop WQBELs based on the Basin Plan Water Quality Objective for turbidity. This Order contains BMPs in lieu of numeric effluent limitations for turbidity.
- (d) **Plant Performance and Attainability.** Based on the sample results for the effluent, the discharge will continue to be in violation of the Basin Plan Water Quality Objective for turbidity. This Order includes a compliance time schedule for the implementation of BMPs that will control the discharge of turbidity.

4. WQBEL Calculations

- a. This Order includes WQBEL's for copper, manganese, mercury, nickel, and pH for Discharge Point 001. The general methodology for calculating WQBEL's based on the different criteria/objectives is described in subsections IV.C.4.b through f, below. See Attachment H for the WQBEL calculations.
- b. **Effluent Concentration Allowance.** For each water quality criterion/objective, the ECA is calculated using the following steady-state mass balance equation from Section 1.4 of the SIP:

$$ECA = C + D(C - B) \quad \text{where } C > B, \text{ and}$$
$$ECA = C \quad \text{where } C \leq B$$

where:

- ECA = effluent concentration allowance
- D = dilution credit
- C = the priority pollutant criterion/objective
- B = the ambient background concentration.

According to the SIP, the ambient background concentration (B) in the equation above shall be the observed maximum with the exception that an ECA calculated from a priority pollutant criterion/objective that is intended to protect human health from carcinogenic effects shall use the arithmetic mean concentration of the ambient background samples. For ECAs based on MCLs, which implement the Basin Plan's chemical constituents objective and are applied as annual averages, an arithmetic mean is also used for B due to the long-term basis of the criteria.

- c. **Basin Plan Objectives.** For WQBEL's based on site-specific numeric Basin Plan objectives or MCLs, the effluent limitations are applied directly as the ECA as either an MDEL, AMEL, or average annual effluent limitations, depending on the averaging period of the objective.

- d. **Aquatic Toxicity Criteria.** WQBEL's based on acute and chronic aquatic toxicity criteria are calculated in accordance with Section 1.4 of the SIP. The ECAs are converted to equivalent long-term averages (i.e. LTA_{acute} and LTA_{chronic}) using statistical multipliers and the lowest LTA is used to calculate the AMEL and MDEL using additional statistical multipliers.
- e. **Secondary MCLs.** The AMEL and MDEL (or AWEL) are calculated using the Secondary MCL and statistical multipliers.
- f. **Human Health Criteria and Primary MCLs.** WQBEL's based on human health criteria, are also calculated in accordance with Section 1.4 of the SIP. The AMEL is set equal to ECA and a statistical multiplier was used to calculate the MDEL.

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

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

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

where:

$mult_{AMEL}$ = statistical multiplier converting minimum LTA to AMEL

$mult_{MDEL}$ = statistical multiplier converting minimum LTA to MDEL

M_A = statistical multiplier converting acute ECA to LTA_{acute}

M_C = statistical multiplier converting chronic ECA to LTA_{chronic}

Summary of Water Quality-Based Effluent Limitations Discharge Point 001

Table F-20. Summary of Water Quality-Based Effluent Limitations – Discharge Point 001

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Copper, Total Recoverable	µg/L	0.92	--	2.5	--	--
Manganese, Total Recoverable	µg/L	87	200	--	--	--
Mercury, Total Recoverable	µg/L	0.05	--	0.14	--	--
Nickel, Total Recoverable	µg/L	8.6	--	19	--	--
pH	Standard Units	--	--	--	6.5	8.5

5. Whole Effluent Toxicity (WET)

For compliance with the Basin Plan's narrative toxicity objective, this Order requires the Discharger to conduct whole effluent toxicity testing on EFF-001 for acute and chronic toxicity, as specified in the Monitoring and Reporting Program (Attachment E section V.).

This Order also contains effluent limitations for acute toxicity and requires the Discharger to implement best management practices to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity.

- a. **Acute Aquatic 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 page III-8.00) The Basin Plan also states that, *“...effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate...”*.

For priority pollutants, the SIP dictates the procedures for conducting the RPA. Acute whole effluent aquatic toxicity is not a priority pollutant. Therefore, the Central Valley Water Board is not restricted to one particular RPA method. Due to the site-specific conditions of the discharge, the Central Valley Water Board has used professional judgment in determining the appropriate method for conducting the RPA. USEPA’s September 2010 NPDES Permit Writer’s Manual, page 6-30, states, *“State implementation procedures might allow, or even require, a permit writer to determine reasonable potential through a qualitative assessment process without using available facility-specific effluent monitoring data or when such data are not available...A permitting authority might also determine that WQBEL’s are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBEL’s for pathogens in all permits for POTW’s discharging to contact recreational waters).”* Acute toxicity effluent limits are required to ensure compliance with the Basin Plan’s narrative toxicity objective.

USEPA Region 9 provided guidance for the development of acute toxicity effluent limitations in the absence of numeric water quality objectives for toxicity in its document titled "Guidance for NPDES Permit Issuance", dated February 1994. In section B.2. "Toxicity Requirements" (pgs. 14-15) it states that, *"In the absence of specific numeric water quality objectives for acute and chronic toxicity, the narrative criterion 'no toxics in toxic amounts' applies. Achievement of the narrative criterion, as applied herein, means that ambient waters shall not demonstrate for acute toxicity: 1) less than 90% survival, 50% of the time, based on the monthly median, or 2) less than 70% survival, 10% of the time, based on any monthly median. For chronic toxicity, ambient waters shall not demonstrate a test result of greater than 1 TUc."* Accordingly, effluent limitations for acute toxicity have been included in this Order as follows:

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.** 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 page III-8.00) Chronic WET data is not available to determine if the discharge has reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan’s narrative toxicity objective.

The Monitoring and Reporting Program of this Order requires chronic WET monitoring of EFF-001 once during the term of this Order for demonstration of

compliance with the narrative toxicity objective. In addition to WET monitoring, the Special Provision in section VI.C.2 of the Order requires the Discharger to submit to the Central Valley Water Board an Initial Investigative TRE Workplan for approval by the Executive Officer, to ensure the Discharger has a plan to immediately move forward with the initial tiers of a Toxicity Reduction Evaluation (TRE), in the event effluent toxicity is encountered in the future. The provision also includes a numeric toxicity monitoring trigger, requirements for accelerated monitoring, and requirements for TRE initiation if toxicity is demonstrated.

To ensure compliance with the Basin Plan's narrative toxicity objective, the Discharger is required to conduct chronic WET testing on EFF-001, as specified in the Monitoring and Reporting Program (Attachment E section V.). Furthermore, the Special Provision contained at VI.C.2 of this Order requires the Discharger to investigate the causes of, and identify and implement corrective actions to reduce or eliminate effluent toxicity. If the discharge demonstrates toxicity exceeding the numeric toxicity monitoring trigger, the Discharger is required to initiate a TRE in accordance with an approved Initial Investigative TRE Work Plan and the TRE Action Plan. The numeric toxicity monitoring trigger is not an effluent limitation; it is the toxicity threshold at which the Discharger is required to perform accelerated chronic toxicity monitoring, as well as, the threshold to initiate a TRE if effluent toxicity has been demonstrated.

If the result of any accelerated toxicity test exceeds the monitoring trigger, the Discharger shall cease accelerated monitoring and begin a TRE to investigate the cause(s) of, and to identify corrective actions to reduce or eliminate, effluent toxicity. Within thirty (30) days of notification by the laboratory of any test result exceeding the monitoring trigger during accelerated monitoring, the Discharger shall submit a TRE Action Plan to the Central Valley Water Board including, at minimum:

- (1) Any specific actions the Discharger will take to investigate and identify the cause(s) of toxicity;
- (2) Any specific actions the Discharger will take to mitigate the impact of the discharge and prevent the recurrence of toxicity;
- (3) An update of the current status of the overall site investigation, assessment of Best Management Practices (BMPs), and/or implementation of BMPs and treatment or control processes; and
- (4) An up-to-date schedule for these actions.

D. Final Effluent Limitation Considerations – Discharge Point 001

1. Mass-based Effluent Limitations

40 C.F.R section 122.45(f)(1) requires effluent limitations be expressed in terms of mass, with some exceptions, and 40 C.F.R. section 122.45(f)(2) allows pollutants that are limited in terms of mass to additionally be limited in terms of other units of measurement. This Order includes effluent limitations expressed in terms of mass and concentration. In addition, pursuant to the exceptions to mass limitations provided in 40 C.F.R. section 122.45(f)(1), some effluent limitations are not expressed in terms of mass, such as pH and temperature, and when the applicable standards are expressed in terms of concentration (e.g., CTR criteria and MCL's) and mass limitations are not necessary to protect the beneficial uses of the receiving water.

Mass-based effluent limitations are calculated by multiplying the concentration limitation by the Facility's reasonable measure of actual flow and the appropriate unit conversion factor. A reasonable measure of actual flow has not yet been provided by the Discharger, to date. Therefore, this Order does not contain mass effluent limitations for chromium, copper, iron, mercury, pH, sedimentation/siltation, and zinc.

2. Averaging Periods for Effluent Limitations

40 C.F.R. section 122.45 (d) requires maximum daily and average monthly discharge limitations for all dischargers other than publicly owned treatment works unless impracticable. The rationale, for using alternative averaging periods for pH is discussed in section IV.C.3 of this Fact Sheet.

3. Satisfaction of Anti-Backsliding Requirements

The CWA specifies that a revised permit may not include effluent limitations that are less stringent than the previous permit unless a less stringent limitation is justified based on exceptions to the anti-backsliding provisions contained in CWA sections 402(o) or 303(d)(4), or, where applicable, 40 C.F.R. section 122.44(l). This Order is a new NPDES Permit for the Discharger. There is no previous NPDES permit and therefore, backsliding is not an issue.

4. Antidegradation Policies

This Order does not allow for an increase in flow or mass of pollutants to the receiving water. Therefore, a complete antidegradation analysis is not necessary. The discharge has been ongoing since the 1880's. The Order requires compliance with applicable federal technology-based standards and with WQBEL's where the discharge could have the reasonable potential to cause or contribute to an exceedance of water quality standards. The permitted discharge is consistent with the antidegradation provisions of 40 C.F.R. section 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 and will result in improved water quality.

5. Stringency of Requirements for Individual Pollutants

WQBEL's in this Order consist of restrictions on copper, manganese, mercury, nickel, and pH, from Discharge Point 001. WQBEL's have been 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 WQBEL's were derived from the CTR, the CTR is the applicable standard pursuant to 40 C.F.R. section 131.38. The procedures for calculating the individual water quality-based effluent limitations for priority pollutants are based on the CTR implemented by the SIP, which was approved by U.S. EPA 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 U.S. EPA prior to 30 May, 2000. Any water quality objectives and beneficial uses submitted to U.S. EPA prior to 30 May, 2000, but not approved by U.S. EPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to 40 C.F.R. section 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the requirements of the CWA.

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

Table F-21. Summary of Final Effluent Limitations – Discharge Point 001

Parameter	Units	Effluent Limitations					Basis
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
Copper, Total Recoverable	µg/L	0.92	--	2.5	--	--	CTR AL
Manganese, Total Recoverable	µg/L	87	200	--	--	--	SMCL
Mercury, Total Recoverable	µg/L	0.05	--	0.14	--	--	CTR HH
Nickel, Total Recoverable	µg/L	8.6	--	19	--	--	CTR AL
pH	Standard Units	--	--	--	6.5	8.5	BP

BP – Based on water quality objectives contained in the Basin Plan.

CTR AL – Based on water quality criteria for aquatic life contained in the CTR and applied as specified in the SIP.

CTR HH – Based on water quality criteria for human health contained in the CTR and applied as specified in the SIP.

SMCL – Based on the Secondary Maximum Contaminant Level.

E. Interim Effluent Limitations – Discharge Point 001

1. During the period beginning 1 October 2017 and ending on 30 September 2027, the Discharger shall maintain compliance with the following limitations at Discharge Point 001, with compliance measured at Monitoring Location EFF-001 as described in the attached MRP. 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.

Table F-22. Interim Effluent Limitations – Discharge Point 001

Parameter	Units	Min/Max Effluent Conc	Effluent Limitations				
			Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Manganese, Total Recoverable	µg/L	1400 max	2000	5000	--	--	--
pH	Standard Units	5.9 - 9.3	--	--	--	5.4	9.8

F. Land Discharge Specifications – Not Applicable

G. Recycling Specifications – Not Applicable

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

A. Surface Water

1. CWA section 303(a-c), requires states to adopt water quality standards, including criteria where they are necessary to protect beneficial uses. The Central Valley Water Board adopted water quality criteria as water quality objectives in the Basin Plan. 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.” The Basin Plan includes numeric and narrative water quality objectives for various beneficial uses and water bodies. This Order contains

receiving surface water limitations based on the Basin Plan numerical and narrative water quality objectives for color, chemical constituents, dissolved oxygen, floating material, oil and grease, pH, suspended sediment, settleable substances, suspended material, tastes and odors, temperature, toxicity, and turbidity.

B. Surface Water Limitations

The discharge at Discharge Point 001 shall not cause the following in Humbug Creek:

1. **Chemical Constituents.** Chemical constituents to be present in concentrations that adversely affect beneficial uses.
2. **Color.** Discoloration that causes nuisance or adversely affects beneficial uses.
3. **Dissolved Oxygen:**
 - a. The 95 percentile dissolved oxygen concentration to fall below 75 percent of saturation; nor
 - b. The dissolved oxygen concentration to be reduced below 7.0 mg/L at any time.

For Discharge Point 001, receiving water monitoring data, measured at monitoring locations RSW-001 and RSW-002, will be used to determine compliance with part "b" of the dissolved oxygen receiving water limitation to ensure the discharge does not cause the dissolved oxygen concentrations in Humbug Creek to be reduced below 7.0 mg/L at any time.
4. **Floating Material.** Floating material to be present in amounts that cause nuisance or adversely affect beneficial uses.
5. **Oil and Grease.** 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.
6. **pH.** The pH to be depressed below 6.5 nor raised above 8.5.
7. **Settleable Substances.** Substances to be present in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.
8. **Suspended Material.** Suspended material to be present in concentrations that cause nuisance or adversely affect beneficial uses.
9. **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.
10. **Taste and Odors.** 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.
11. **Temperature.** The temperature of Humbug Creek to be increased by more than 5°F.

Compliance for Discharge Point 001 to be determined based on the difference in temperature at Monitoring Locations RSW-001 and RSW-002.
12. **Toxicity.** Toxic substances to be present, individually or in combination, in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.

13. Turbidity:

- a. Shall not exceed 2 Nephelometric Turbidity Units (NTU) where natural turbidity at RSW-001 is less than 1 NTU;
- b. Shall not increase more than 1 NTU where natural turbidity at RSW-001 is between 1 and 5 NTUs;
- c. Shall not increase more than 20 percent where natural turbidity at RSW-001 is between 5 and 50 NTUs;
- d. Shall not increase more than 10 NTU where natural turbidity at RSW-001 is between 50 and 100 NTUs; nor
- e. Shall not increase more than 10 percent where natural turbidity at RSW-001 is greater than 100 NTUs.

C. Groundwater – Not Applicable

D. Groundwater Limitations – Not Applicable

VI. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with 40 C.F.R. section 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 C.F.R. section 122.42, are provided in Attachment D. The discharger must comply with all standard provisions and with those additional conditions that are applicable under section 122.42.

Sections 122.41(a)(1) and (b) through (n) of 40 C.F.R. 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. Section 123.25(a)(12) of 40 C.F.R. allows the state to omit or modify conditions to impose more stringent requirements. In accordance with 40 C.F.R. section 123.25, this Order omits federal conditions that address enforcement authority specified in 40 C.F.R. sections 122.41(j)(5) and (k)(2) because the enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates by reference Water Code section 13387(e).

B. Special Provisions

1. Reopener Provisions

- a. Conditions that necessitate a major modification of a permit are described in 40 CFR section 122.62, including, but not limited to:
 - i. If new or amended applicable water quality standards are promulgated or approved pursuant to section 303 of the CWA, or amendments thereto, this permit may be reopened and modified in accordance with the new or amended standards.
 - ii. When new information, that was not available at the time of permit issuance, would have justified different permit conditions at the time of issuance.
- b. **Flow.** This provision allows the Central Valley Water Board to reopen this Order if the Central Valley Water Board determines that a treatment and/or control facility has been constructed and operational specifications for flow are warranted.

- c. **Hardness-Dependent Metals.** This provision allows the Central Valley Water Board to reopen this Order for the hardness-dependent metals, chromium III, copper, and zinc, to establish additional or modified effluent limitations as follows:
 - i. **Copper**
 - (a) Water Effects Ratio (WER) and Metal Translators. A default WER of 1.0 has been used in this Order for calculating criteria for copper. In addition, a default dissolved-to-total metal translator has been used to convert water quality objectives from dissolved to total recoverable when developing effluent limitations for copper. If the Discharger performs studies to determine a site-specific WER and/or site-specific dissolved-to-total metal translator, this Order may be reopened to modify the effluent limitations for copper.
 - (b) If an applicable TMDL program for copper is adopted.
 - ii. **Chromium III and Zinc**
 - (a) If applicable TMDL programs for chromium and/or zinc are adopted.
- d. **Mercury.** This provision allows the Central Valley Water Board to reopen this Order if the Central Valley Water Board determines that a mercury offset program is feasible for dischargers subject to NPDES permits. In addition, this Order may be reopened to establish additional or modified effluent limitations for mercury as follows:
 - i. If the Statewide Mercury Program is adopted with new Water Quality Objectives for mercury;
 - ii. If TMDLs for mercury are developed for Humbug Creek; or
 - iii. If Waste Load Allocations (WLAs) are established for mercury that include allocations for Malakoff Diggins.
- e. **Iron and Total Chromium.** This provision allows the Central Valley Water Board to reopen this Order for iron and total chromium to establish additional or modified effluent limitations
 - i. If applicable TMDLs for iron and chromium are developed.
- f. **pH.** This provision allows the Central Valley Water Board to reopen this Order for pH to establish additional or modified effluent limitations if applicable TMDLs for pH are developed.
- g. **Sediment/Siltation.** This provision allows the Central Valley Water Board to reopen this Order if applicable WLAs for sediment/siltation are developed.
- h. **Turbidity.** This provision allows the Central Valley Water Board to reopen this Order if the Central Valley Water Board determines that a treatment and/or control facility has been constructed and turbidity operation specifications are warranted.
- i. **Whole Effluent Toxicity.** As a result of a Toxicity Reduction Evaluation (TRE), this Order may be reopened to include a numeric or narrative chronic toxicity limitation, a new acute toxicity limitation, and/or a limitation for a specific toxicant identified in the TRE. Additionally, if the State Water Board revises the SIP's toxicity control provisions that would require the establishment of numeric chronic toxicity effluent limitations, this Order may be reopened to include a numeric chronic toxicity effluent limitation based on the new provisions.

- j. **Treatment System Flow Schematic.** If a treatment or control facility is installed during the term of this Order, the Central Valley Water Board may reopen this Order to include a flow schematic in Attachment C.

2. Special Studies and Additional Monitoring Requirements

- a. **Toxicity Reduction Evaluation Requirements.** For compliance with the Basin Plan's narrative toxicity objective, this Order requires the Discharger to conduct chronic whole effluent toxicity (WET) testing on the discharge at EFF-001, as specified in the MRP section V. Furthermore, this Provision requires the Discharger to investigate the causes of, and to identify corrective actions to reduce or eliminate, effluent toxicity. If the discharge exceeds the numeric toxicity monitoring trigger during accelerated monitoring established in this Provision, the Discharger is required to initiate a Toxicity Reduction Evaluation (TRE) in accordance with an approved Initial Investigative TRE Work Plan and TRE Action Plan, and take actions to mitigate the impact of the discharge and prevent recurrence of toxicity. A TRE is a site-specific study conducted in a stepwise process to identify the source(s) of toxicity and the effective control measures for effluent toxicity. TREs are designed to identify the causative agents and sources of whole effluent toxicity, evaluate the effectiveness of the toxicity control options, and confirm the reduction in effluent toxicity. This Provision includes procedures for accelerated chronic toxicity monitoring and TRE initiation.
 - i. **Initial Investigative TRE Work Plan.** Within 90 days of the effective date of this Order, the Discharger shall submit to the Central Valley Water Board an Initial Investigative TRE Work Plan for approval by the Executive Officer. This should be a one to two page document that includes a description of the investigation and evaluation techniques that will be used to identify potential causes and sources of effluent toxicity and effluent variability and to ensure the discharger has a plan to immediately move forward with the initial tiers of a TRE.
 - ii. **Accelerated Monitoring and TRE Initiation.** When the numeric toxicity monitoring trigger is exceeded during regular chronic toxicity monitoring, and the testing meets all test acceptability criteria, the Discharger shall initiate accelerated monitoring as required in the Accelerated Monitoring Specifications. The Discharger shall initiate a TRE to address effluent toxicity if any WET testing results exceed the numeric toxicity monitoring trigger during accelerated monitoring.
 - iii. **Numeric Toxicity Monitoring Trigger.** The numeric toxicity monitoring trigger to initiate a TRE is 2 samples out of 3 with a $TU_c > 1$ and % effect > 25% (where $TU_c = 100/NOEC$). The monitoring trigger is not an effluent limitation; it is the toxicity threshold at which the Discharger is required to begin accelerated monitoring and initiate a TRE.
 - iv. **Accelerated Monitoring Specifications.** If the numeric toxicity monitoring trigger is exceeded during regular chronic toxicity testing, the Discharger shall initiate accelerated monitoring within 14 days of notification by the laboratory of the exceedance. Accelerated monitoring shall consist of four chronic toxicity tests conducted once every two weeks using the species that exhibited toxicity. The following protocol shall be used for accelerated monitoring and TRE initiation:
 - (a) If the results of four consecutive accelerated monitoring tests do not exceed the monitoring trigger, the Discharger may cease accelerated monitoring and resume regular chronic toxicity monitoring.

- (b) If the result of any accelerated toxicity test exceeds the monitoring trigger, the Discharger shall cease accelerated monitoring and begin a TRE to investigate the cause(s) of, and identify corrective actions to reduce or eliminate, effluent toxicity. Within thirty (30) days of notification by the laboratory of any test result exceeding the monitoring trigger during accelerated monitoring, the Discharger shall submit a TRE Action Plan to the Central Valley Water Board including, at minimum:
- (1) Any specific actions the Discharger will take to investigate and identify the cause(s) of toxicity;
 - (2) Any specific actions the Discharger will take to mitigate the impact of the discharge and prevent the recurrence of toxicity;
 - (3) An update of the current status of the overall site investigation, assessment of Best Management Practices (BMPs), and/or implementation of BMPs and treatment or control processes; and
 - (4) An up-to-date schedule for these actions.

3. Best Management Practices as Required in 40 CFR §122.44(k)

- a. The Central Valley Water Board is authorized under the federal regulations (40 CFR 122.44(k)) to impose Best Management Practices (BMPs) to control or abate the discharge of pollutants in lieu of numeric effluent limitations when the Board finds that BMPs are reasonably necessary to achieve effluent limitations and standards, or to carry out the purposes and intent of the federal Clean Water Act.

The Basin Plan contains several Water Quality Objectives that are applicable to the discharge from Malakoff Diggins. Discharge from Malakoff Diggins is in violation of the following Water Quality Objectives:

- i. **Sediment.** The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
- ii. **Settleable Material.** Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.
- iii. **Suspended Material.** Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.
- iv. **Turbidity.** Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:
 - Where natural turbidity is less than 1 Nephelometric Turbidity Unit (NTU), controllable factors shall not cause downstream turbidity to exceed 2 NTUs.
 - Where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU.
 - Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.
 - Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.

- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

This Order contains a turbidity receiving water limitation based on the numeric Basin Plan Water Quality Objective for turbidity. This Order also contains receiving water limitations for sediment, settleable material, and suspended material based on the Water Quality Objectives. Numeric effluent limitations are not feasible for the turbidity, sediment, settleable material, and suspended material Water Quality Objectives. Malakoff Diggins must control erosion and the discharge of sediment to Diggins Creek and Humbug Creek, and downstream waters. The Discharger must also manage runoff from the site. Therefore, the Central Valley Water Board may require BMPs to implement water quality standards.

USEPA has developed a relevant document for assessing applicable BMPs for industrial facilities; *Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices*, 1992.

- b. The Discharger must submit a BMP Options Assessment/Engineering Evaluation by **1 April 2020**, must submit a BMP Plan by **1 October 2020** for approval by the Executive Officer, must submit confirmation of financial resource commitment for the selected BMPs by **1 April 2021**, and must submit a technical report by **1 October 2021** documenting implementation of the selected BMPs. The BMP requirements are also presented in Time Schedule Order R5-2017-0087. The Discharger shall comply with the following time schedule to complete the BMP options assessment and implementation:

The BMP Options Assessment/Engineering Evaluation must assess, at a minimum, the following BMPs:

- i. Flow Diversion Practices, including but not limited to storm water conveyance, diversion dikes, and graded areas;
- ii. Exposure Minimization Practices, including but not limited to containment diking, curbing, collection basins, sumps, and covering;
- iii. Sediment and Erosion Prevention Practices, including but not limited to preservation of natural vegetation, permanent seeding and planting, interceptor dikes and swales, pipe slope drains, subsurface drains, filter fences, brush and hay bale barriers, berms, sediment traps, sediment basins, check dams, and gradient terraces;
- iv. Infiltration Practices, including but not limited to vegetated filter strips, grassed swales, and infiltration trenches; and
- v. Mitigative Practices, including but not limited to excavation, filtration, and sedimentation basins;
- vi. Other Minimization, Preventive, and Mitigative Practices not listed in this Order;

The Discharger shall develop and implement the BMP Plan to prevent or minimize the generation and discharge of wastes and pollutants to waters of the United States and to waters of the State and ensure disposal or land application of wastes is in compliance with applicable solid waste disposal regulations. The Discharger shall review the BMP Plan annually and must amend the BMP Plan whenever there is a change in the facility or in the operation of the facility which materially increases the generation of pollutants or their release or potential release to surface waters. The BMP Plan shall include all BMPs selected for implementation at the facility. Once

approved by the Executive Officer, the Discharger shall ensure that its operations staff are familiar with the BMP Plan and have been adequately trained in the specific procedures it requires. See Time Schedule Order R5-2017-0087 for further reference.

4. Construction, Operation, and Maintenance Specifications

- a. **Construction Specifications.** Construction activities shall be conducted in accordance with the BMP Plan approved by the Executive Officer.
- b. **Solids Disposal Specifications.** Collected screenings, sludge, and other solids, 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.

5. Special Provisions for Municipal Facilities (POTW’s only) – Not Applicable

6. Compliance Schedules

- a. **Compliance schedules for final effluent limitations for manganese and pH at EFF-001.** This Order requires compliance with the final effluent limitations by 30 September 2027. Implementation of BMPs is integral to the control of sediment that is the source of manganese and pH in the discharge at EFF-001. Therefore, the BMP implementation schedule is included as a subset in the overall compliance schedule. The Discharger shall comply with the following time schedule to ensure compliance with the final effluent limitations:

Table F-23. EFF-001 Task Schedule and Compliance Dates

Task	Compliance Date
1. Submit all monitoring data from wet season 2016-2017.	1 November 2017
2. Submit a Work Plan for an Engineering Evaluation that includes: <ul style="list-style-type: none"> a. Definition of spoils piles within the Pit; b. Slope Stability Analysis of Pit walls; c. Compilation of GPS coordinates for RSW-001 and RSW-002 d. Pit Assessment (that may include but is not limited to): <ul style="list-style-type: none"> • Detailed Topographic Survey. • Hydrologic Model. 	1 April 2018
3. Submit a Watershed Assessment <ul style="list-style-type: none"> a. Diggins Creek <ul style="list-style-type: none"> • Assess any other sources that may flow into Diggins Creek between Hiller Tunnel and Humbug Creek b. Humbug Creek, upstream of the confluence with Diggins Creek <ul style="list-style-type: none"> • Research additional sources of mercury, hardness-dependent metals, aluminum, iron, and manganese c. Humbug Creek, downstream of the confluence with Diggins Creek to the boundary of the Park <ul style="list-style-type: none"> • Research additional sources of mercury, hardness-dependent metals, aluminum, iron, and manganese, including but not limited to the Shaft 5 discharge to Humbug Creek, the NBT Outlet discharge to Humbug Creek. 	1 October 2018
4. Submit the Engineering Evaluation Report from Task 2, above.	1 October 2019
5. Submit a BMP Options Assessment/Engineering Evaluation, including but not limited to the following Practices: <ul style="list-style-type: none"> a. Flow Diversion Practices such as storm water conveyance, diversion dikes, 	1 April 2020

<p>and graded areas.</p> <p>b. Exposure Minimization Practices such as containment diking, curbing, collection basins, sumps, and covering.</p> <p>c. Sediment and Erosion Prevention Practices such as preservation of natural vegetation, permanent seeding and planting, interceptor dikes and swales, pipe slope drains, subsurface drains, filter fences, brush and hay bale barriers, berms, sediment traps, sediment basins, check dams, and gradient terraces.</p> <p>d. Infiltration Practices such as vegetated filter strips, grassed swales, and infiltration trenches.</p> <p>e. Mitigation Practices such as excavation, filtration units, and sedimentation basins.</p> <p>f. Other Minimization, Preventive, and Mitigation Practices not listed here.</p>	
6. Submit a BMP Plan for Executive Officer approval.	1 October 2020
7. Submit confirmation of financial resource commitment for selected BMPs.	1 April 2021
8. Submit a technical report documenting implementation of BMPs.	1 October 2021
9. Submit a technical report assessing mitigation and/or control alternatives and a time schedule for implementation of the selected alternatives: <ul style="list-style-type: none"> To achieve compliance with final effluent limitations at EFF-001 by 30 September 2027. 	1 April 2022
10. Submit confirmation of financial resource commitment for the selected mitigation and/or control alternatives.	1 April 2023
11. Submit confirmation of start of construction of selected mitigation and/or control alternatives.	1 April 2024
12. Submit a technical report documenting that construction has been completed on the selected mitigation and/or control alternatives.	1 April 2026
13. Submit a technical report documenting full operation of the selected mitigation and/or control alternatives.	1 April 2027
14. Comply with the Final Effluent Limitations at EFF-001 for manganese and pH.	30 September 2027
15. Submit Annual Progress Reports documenting the steps taken to comply with this Order, describing the completion of tasks, progress of construction, evaluation of the effectiveness of the implemented measures, and an assessment of whether additional measures are necessary to meet the final compliance date of 30 September 2027 .	1 April annually, beginning on 1 April 2018

b. Time Schedule Order R5-2017-0087 contains a schedule for compliance with the final effluent limitations for copper, mercury, and nickel. Tasks 1 through 8, and the submittal dates for Annual Progress Reports, from 1 April 2018 to 1 April 2022, are the same in both compliance schedules.

c. **Compliance schedule for investigation and characterization of discharges at Shaft 5 and the NBT Outlet.** This Order requires the following:

Table F-24. Shaft 5 and North Bloomfield Tunnel Outlet Task Schedule and Compliance Dates

Task	Compliance Date
1. Submit a Work Plan to investigate and characterize the discharges at Shaft 5 and the NBT Outlet.	1 April 2018
2. Complete the investigations of Shaft 5 and the NBT Outlet.	1 October 2020
3. Submit Technical Report with results of investigation and recommendations (i.e., continue or discontinue monitoring, propose	1 April 2021

treatment options if warranted, etc).	
4. Implement the Technical Report recommendations from Task Item 3.	1 October 2021
5. Submit ROWD(s), if necessary.	1 October 2021
6. Submit Quarterly Progress Reports documenting the status of the investigation.	1 April, 1 July, 1 October, and 1 January beginning 1 April 2018

VII. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

CWA section 308 and 40 C.F.R. sections 122.41(h), (j)-(l), 122.44(i), and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Water Code sections 13267 and 13383 also authorize the Central Valley Water Board to establish monitoring, inspection, entry, reporting, and recordkeeping requirements. The Monitoring and Reporting Program (MRP), Attachment E of this Order establishes monitoring, reporting, and recordkeeping requirements that implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the MRP for this facility.

A. Influent Monitoring – Not Applicable

B. Effluent Monitoring

1. Pursuant to the requirements of 40 C.F.R. section 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. Water Code section 13176, subdivision (a), states: “The analysis of any material required by [Water Code sections 13000-16104] shall be performed by a laboratory that has accreditation or certification pursuant to Article 3 (commencing with Section 100825) of Chapter 4 of Part 1 of Division 101 of the Health and Safety Code.” The DDW certifies laboratories through its ELAP.

Section 13176 cannot be interpreted in a manner that would violate federal holding time requirements that apply to NPDES permits pursuant to the CWA. (Wat. Code §§ 13370, subd. (c), 13372, 13377.) Section 13176 is inapplicable to NPDES permits to the extent it is inconsistent with CWA requirements. (Wat. Code § 13372, subd. (a).) The holding time requirements are 15 minutes for dissolved oxygen and pH, and immediate analysis is required for temperature. (40 C.F.R. § 136.3(e), Table II) Due to the location of the Facility, it is both legally and factually impossible for the Discharger to comply with section 13176 for constituents with short holding times. Therefore, 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.

C. Whole Effluent Toxicity Testing Requirements

1. **Acute Toxicity.** 96-hour bioassay testing is required to demonstrate compliance with the effluent limitation for acute toxicity.
 - Monitoring Frequency for EFF-001 – The Discharger shall perform **monthly** acute toxicity testing, while discharging, not to exceed 4x/year.
2. **Chronic Toxicity.** Annual chronic whole effluent toxicity testing is required for EFF-001 in order to demonstrate compliance with the Basin Plan’s narrative toxicity objective.

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.

2. Groundwater – Not Applicable

E. Other Monitoring Requirements – Not Applicable

VIII. PUBLIC PARTICIPATION

The Central Valley Water Board has considered the issuance of WDR's that will serve as an NPDES permit for the discharge from the Pit at Malakoff Diggins State Historic Park. As a step in the WDR's adoption process, the Central Valley Water Board staff has developed tentative WDR's and has encouraged public participation in the WDR's adoption process.

A. Notification of Interested Parties

The Central Valley Water Board notified the Discharger and interested agencies and persons of its intent to prescribe WDR's for the discharge and provided an opportunity to submit written comments and recommendations. Notification was provided by posting at the Nevada City city hall and at the public entrance to the Facility on 12 July 2017.

The public had access to the agenda and any changes in dates and locations through the Central Valley Water Board's website at:

http://www.waterboards.ca.gov/centralvalley/board_info/meetings/

B. Written Comments

Interested persons were invited to submit written comments concerning tentative WDR's as provided through the notification process. Comments were due either in person or by mail to the Executive Office at the Central Valley Water Board at the address on the cover page of this Order.

To be fully responded to by staff and considered by the Central Valley Water Board, the written comments were due at the Central Valley Water Board office by 5:00 p.m. on 4 August 2017.

C. Public Hearing

The Central Valley Water Board held a public hearing on the tentative WDR's during its regular Board meeting on the following date and time and at the following location:

Date: 11 August 2017
Time: 9:00 a.m.
Location: Regional Water Quality Control Board, Central Valley Region
11020 Sun Center Dr., Suite #200
Rancho Cordova, CA 95670

Interested persons were invited to attend. At the public hearing, the Central Valley Water Board heard testimony pertinent to the discharge, WDR's, and permit. For accuracy of the record, important testimony was requested in writing.

D. Reconsideration of Waste Discharge Requirements

Any aggrieved person may petition the State Water Board to review the decision of the Central Valley Water Board regarding the final WDR's. The petition must be received by the

State Water Board at the following address within 30 calendar days of the Central Valley Water Board's action:

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

For instructions on how to file a petition for review, see

http://www.waterboards.ca.gov/public_notices/petitions/water_quality/wqpetition_instr.shtml

E. Information and Copying

The Report of Waste Discharge, other supporting documents, and comments received 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 Central Valley Water Board by calling (916) 464-3291.

F. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding the WDR's and NPDES permit should contact the Central Valley 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 Elizabeth A. Thayer at (916) 464-4671 or beth.thayer@waterboards.ca.gov.

ATTACHMENT G – SUMMARY OF REASONABLE POTENTIAL ANALYSIS

Constituent	Units	MEC	B	C	CMC	CCC	Water & Org	Org. Only	Basin Plan	MCL	Reasonable Potential
Aluminum	µg/L	120	39	200	--	--	--	--	--	200	No
Arsenic	µg/L	7.2	--	10	--	--	--	--	--	10	No
Cadmium	µg/L	0.42J	ND<1.0	0.57	0.57	0.58	--	--	--	--	No
Chromium III	µg/L	0.33	0.18J	40	120	40	--	--	--	--	No
Chromium	µg/L	0.33	0.18J	50	--	--	--	--	--	50	No
Copper	µg/L	2.5	3.2	1.9	2.4	1.9	--	--	--	--	Yes
Iron	µg/L	180	68	300	--	--	--	--	--	300	No
Lead	µg/L	0.11J	ND<0.08	0.33	8.4	0.33	--	--	--	--	No
Manganese	µg/L	410	ND<12	50	--	--	--	--	--	50	Yes
Mercury	µg/L	0.74	0.016J	0.050	--	--	0.050	0.051	--	--	Yes
Nickel	µg/L	33	5.7	11	100	11	--	--	--	--	Yes
pH	Standard units	5.9-9.3	--	6.5-8.5	--	--	--	--	6.5-8.5	--	Yes
Salinity (EC)	µmhos/cm	131	--	900	--	--	--	--	--	900	No
Silver	µg/L	0.48J	ND<0.25	0.16	--	0.16	--	--	--	--	No
Turbidity	NTU	1400	--	5	--	--	--	--	--	5	Yes
Zinc	µg/L	5.8J	ND<5	25	25	25	--	--	--	--	No

MEC = Maximum Effluent Concentration

B = Maximum Receiving Water Concentration or lowest detection level, if non-detect

C = Criterion used for Reasonable Potential Analysis

CMC = Criterion Maximum Concentration (CTR or NTR)

CCC = Criterion Continuous Concentration (CTR or NTR)

Water&Org = Human Health Criterion for Consumption Water & Organisms (CTR or NTR)

Org. Only = Human Health Criterion for Consumption of Organisms Only (CTR or NTR)

Basin Plan = Numeric Site-specific Basin Plan Water Quality Objective

MCL = Drinking Water Standards Maximum Contaminant Level

NA = Not Available

ND = Non-detect

ATTACHMENT H – CALCULATION OF WQBEL’S

Human Health WQBEL’s Calculations									
Parameter	Units	Criteria	Mean Background Concentration	Dilution Factor	MDEL/AMEL Multiplier	AMEL Multiplier	AMEL	MDEL	AWEL
Manganese	µg/L	50	560	--	2.27	1.73	87 ¹	--	197 ¹
Mercury	µg/L	0.050	0.15	--	2.87	2.38	0.05 ²	--	0.11 ²
pH	Standard Units	6.5-8.5	5.9-9.3 ³	--	--	--	--	--	--

- ¹ Calculated by setting the LTA equal to the Secondary MCL of 50 µg/L and using the AMEL multiplier to set the AMEL. The AWEL was calculated from the AMEL using the MDEL/AMEL multiplier. (Table 2 of the SIP)
- ² Calculated by setting the LTA equal to the Secondary MCL of 0.050 µg/L and using the AMEL multiplier to set the AMEL. The AWEL was calculated from the AMEL using the MDEL/AMEL multiplier. (Table 2 of the SIP)
- ³ Minimum and Maximum concentrations

Aquatic Life WQBEL’s Calculations															
Parameter	Units	Criteria		Dilution Factors		Aquatic Life Calculations							Final Effluent Limitations		
		CMC	CCC	CMC	CCC	ECA Multiplier ^{acute}	LTA ^{acute}	ECA Multiplier ^{chronic}	LTA ^{chronic}	AMEL Multiplier ⁹⁵	AWEL Multiplier	MDEL Multiplier ⁹⁹	AMEL ¹	AWEL ²	MDEL ³
Copper	mg/L	2.4	1.9	--	--	0.17	0.4	0.31	0.59	2.17	--	5.94	0.92	--	2.5
Nickel	µg/L	100	11	--	--	0.27	27.1	0.47	5.15	1.68	--	3.69	8.6	--	19

- ¹ Average Monthly Effluent Limitations are calculated according to Section 1.4 of the SIP using a 95th percentile occurrence probability.
- ² Average Weekly Effluent Limitations are calculated according to Section 1.4 of the SIP using a 98th percentile occurrence probability.
- ³ Maximum Daily Effluent Limitations are calculated according to Section 1.4 of the SIP using a 99th percentile occurrence probability.