CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

CENTRAL VALLEY REGION

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ORDER NO. R5-2008-0059-01
NPDES NO. CA0079103
as amended by Order No. R5-2010-0040

WASTE DISCHARGE REQUIREMENTS FOR THE CITY OF MODESTO WATER QUALITY CONTROL FACILITY STANISLAUS COUNTY

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

Table 1. Discharger Information

Discharger	City of Modesto
Name of Facility	City of Modesto Water Quality Control Facility
Facility Address	1221 Sutter Ave
	Modesto, CA 95351
	Stanislaus County
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Quality Control Board have classified this discharge as a **major** discharge.	

The discharge by the City of Modesto from the discharge points identified below is subject to waste discharge requirements as set forth in this Order:

Table 2. Discharge Location

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
001	Treated Municipal Wastewater	37º, 31', 20" N	121º, 05', 47" W	San Joaquin River

Table 3. Administrative Information

This Order was adopted by the Regional Water Quality Control Board on:	**25 April 2008**
This Order shall become effective on:	**14 June 2008**
This Order shall expire on:	**1 April 2013**
The Discharger shall file a Report of Waste Discharge in accordance with title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than:	**180 days prior to the Order expiration date**

IT IS HEREBY ORDERED, that Order No.5-01-120 is rescinded upon the effective date of this Order except for enforcement purposes, and, in order to meet the provisions contained in division 7 of the Water Code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 federal Clean Water Act (CWA) and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 25 April 2008 and amended on 18 March 2010 by Order No. R5-2010-0040.

Original Signed by Kenneth D. Landau
PAMELA C. CREEDON, Executive Officer

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I. FACILITY INFORMATION

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

Table 4. Facility Information

Discharger	City of Modesto
Name of Facility	City of Modesto Water Quality Control Facility
Facility Address	1221 Sutter Ave
	Modesto, CA 95351
	Stanislaus
Facility Contact, Title, and Phone	Gary DeJesus, Deputy Director, Public Works (209) 577-6300
Mailing Address	SAME
Type of Facility	Publicly Owned Treatment Works
Facility Design Flow	70 million gallons per day (mgd) Secondary-level Treatment 4.8 mgd Advanced Treatment

II. FINDINGS

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

A. Background. The City of Modesto (hereinafter Discharger) is currently discharging pursuant to Order No. 5-01-120 and National Pollutant Discharge Elimination System (NPDES) Permit No. CA0079103. The Discharger submitted a Report of Waste Discharge, dated 10 November 2005**,** and applied for a NPDES permit renewal to discharge up to 70 mgd of disinfected secondary treated wastewater from the City of Modesto Water Quality Control Facility**,** hereinafter Facility, to the San Joaquin River from Oct 1 to May 31 under conditions of a 20:1 flow ratio (receiving water: effluent). On 4 April 2006, the Discharger submitted an Amendment to the Report of Waste Discharge requesting the year-round discharge of up to 10 mgd of tertiary (or equivalent) treated wastewater from the Facility to the San Joaquin River. The application was deemed complete on 21 April 2006. Subsequent communications from the Discharger, including a letter dated 8 November 2006, and the June 2007 antidegradation analysis included only a 4.8 mgd total year-round tertiary discharge.

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. Facility Description. The Discharger owns and operates The Facility that consists of separate primary and secondary treatment plants. The primary treatment plant, located at 1221 Sutter Avenue in the City of Modesto, provides pumping, screening, grit removal, flow measurement, primary clarification, and sludge digestion. The clarified

effluent from the primary treatment plant is then transported approximately 6.5 miles southwest to the secondary treatment plant. At the secondary treatment plant, located at 7007 Jennings Road in the City of Modesto, approximately half of the primary plant effluent is treated in fixed film reactors (FFR's). The remaining primary effluent is discharged to an aerated recirculation channel, where it is combined with the effluent from the FFR. Flow in the aerated recirculation channel is then distributed to three parallel facultative ponds for further treatment, and its effluent is transferred to one of two storage ponds until it can be discharged to the San Joaquin River, or applied to the Discharger's 2,526 acre ranch. From October 1 through May 31, disinfected secondary-level effluent may be discharged from Discharge Point 001 (see table on cover page) to the San Joaquin River, a water of the United States, within Hydrologic Unit 535/541. The Facility location is shown in Attachment B, and the Facility flow schematic is shown in Attachment C. The Discharger is proposing to construct a new advance treatment system, in two phases (Phase 1A and Phase 1B), capable of discharging up to 4.8 mgd of Title 22 tertiary (or equivalent) treated wastewater year round from the Discharge Point 001. Phase 1A will consist of the addition of 2.3 mgd of Title 22 tertiary (or equivalent) treated wastewater, and is expected to be completed by 2009. Phase 1B will add an additional 2.5 mgd and is expected to be completed by 2011. A description of the planned changes is discussed in Attachment F.

C. Legal Authorities. This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (USEPA) and chapter 5.5, division 7 of the California Water Code (commencing with section 13370). It shall serve as a NPDES permit for point source discharges from The Facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the Water Code (commencing with section 13260).

D. Background and Rationale for Requirements. The Regional Water Board developed the requirements in this Order based on information submitted as part of the application, through monitoring and reporting programs, and other available information. The Fact Sheet (Attachment F), which contains background information and rationale for Order requirements, is hereby incorporated into this Order and constitutes part of the Findings for this Order. Attachments A through G are also incorporated into this Order.

E. California Environmental Quality Act (CEQA). Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA, Public Resources Code sections 21100-21177.

F. Technology-based Effluent Limitations*.* Section 301(b) of the CWA and implementing USEPA permit regulations at section 122.44, title 40 of the Code of Federal Regulations (CFR)[1] 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 discharge authorized by this Order must meet minimum federal technology-based requirements

[1] All further statutory references are to title 40 of the Code of Federal Regulations unless otherwise indicated.

based on Secondary Treatment Standards at Part 133. A detailed discussion of the technology-based effluent limitations development is included in the Fact Sheet (Attachment F).

G. Water Quality-based Effluent Limitations. Section 301(b) of the CWA and 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. This Order contains requirements, expressed as a technology equivalence requirement. These requirements are more stringent than secondary treatment requirements that are necessary to meet applicable technology-based standards, but are necessary to protect beneficial uses and therefore required by the Clean Water Act. Nevertheless, the Regional Water Board has considered the factors listed in CWC Section 13241 in establishing these requirements. The rationale for these requirements, which consist of tertiary treatment or equivalent requirements, is discussed in the Fact Sheet (Attachment F).

Section 122.44(d)(1)(i) mandates 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, water quality-based effluent limitations (WQBELs) must be established using: (1) 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 40 CFR section 122.44(d)(1)(vi).

H. Water Quality Control Plans. The Regional Water Board adopted a *Water Quality Control Plan, Fourth Edition (Revised October 2007), for the Sacramento and San Joaquin River Basins* (hereinafter Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. In addition, the Basin Plan implements State Water Resources Control Board (State Water Board) Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the San Joaquin River, from the mouth of the Merced River to Vernalis, are as follows:

Table 5. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	**San Joaquin River, from the mouth of the Merced River to Vernalis**	Existing: Agricultural supply (AGR) including both irrigation and stock watering; industrial process supply (PRO); body contact recreation, canoeing and rafting, (REC-1); and, other non-body contact recreation (REC-2); warm freshwater aquatic habitat (WARM); migration of aquatic organisms (MIGR) both warm and cold habitats; warm habitat spawning, reproduction, and/or early development (SPWN); and, wildlife habitat (WILD). Potential: Municipal and domestic water supply (MUN).

The Basin Plan includes a list of Water Quality Limited Segments (WQLSs), which are defined as "…*those sections of lakes, streams, rivers or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate limitations for point sources (40 CFR 130, et seq.)*." The Basin Plan also states, "*Additional treatment beyond minimum federal standards will be imposed on dischargers to WQLSs. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment.*" Pollutants identified on the California 303(d) List as impairing the San Joaquin River include boron, selenium, electrical conductivity, chlorpyrifos, diazinon, DDT, Group A pesticides, and unknown toxicity. With the exception of unknown toxicity, agriculture is identified as the primary source of pollutants on the California 303(d) List impairing the San Joaquin River. Additionally, Table III-1 of the Basin Plan contains trace element water quality objectives for specific constituents and water bodies. Objectives for boron, selenium, and molybdenum are identified for the San Joaquin River, from the mouth of the Merced River to Vernalis.

I. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** USEPA 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, USEPA 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 water quality criteria for priority pollutants.

J. **State Implementation Policy.** On 2 March 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on 28 April 2000, with respect to the priority pollutant criteria promulgated for California by the USEPA through the NTR and to the priority pollutant objectives established by the Regional Water Board in the Basin Plan. The SIP became effective on 18 May 2000, with respect to the priority pollutant criteria promulgated by the USEPA through the 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.

K. Compliance Schedules and Interim Requirements. In general, an NPDES permit must include final effluent limitations that are consistent with CWA section 301 and with 40 CFR 122.44(d). There are exceptions to this general rule. The State Water Board has concluded that where the Regional Water Board's Basin Plan allows for schedules of compliance and the Regional Water Board is newly interpreting a narrative standard, it may include schedules of compliance in the permit to meet effluent limits that implement a narrative standard. See In the Matter of Waste Discharge Requirements for Avon Refinery (State Board Order WQ 2001-06 at pp. 53-55). See also Communities for a Better Environment et al. v. State Water Resources Control Board, 34 Cal.Rptr.3d 396, 410 (2005). The Basin Plan for the Sacramento and San Joaquin Rivers includes a provision that authorizes the use of compliance schedules in NPDES permits for water quality objectives that are adopted after the date of adoption of the Basin Plan, which was 25 September 1995 (See Basin Plan at page IV-16). Consistent with the State Water Board's Order in the CBE matter, the Regional Water Board has the discretion to include compliance schedules in NPDES permits when it is including an effluent limitation that is a "new interpretation" of a narrative water quality objective. This conclusion is also consistent with USEPA's policies and administrative decisions (See, e.g., Whole Effluent Toxicity (WET) Control Policy). The Regional Water Board, however, is not required to include a schedule of compliance. The Regional Water Board will consider the merits of each case in determining whether it is appropriate to include a compliance schedule in a permit, and, consistent with the Basin Plan, should consider feasibility of achieving compliance. The Regional Water Board must impose a schedule that is as short as practicable to achieve compliance with the objectives, criteria, or effluent limit based on the objective or criteria.

For CTR constituents, Section 2.1 of the SIP provides that, based on a discharger's request and demonstration that it is infeasible for an existing discharger to achieve immediate compliance with an effluent limitation derived from a CTR criterion, compliance schedules may be allowed in an NPDES permit. Unless an exception has been granted under section 5.3 of the SIP, a compliance schedule may not exceed 5 years from the date that the permit is issued or reissued, nor may it extend beyond 10 years from the effective date of the SIP (or 18 May 2010) to establish and comply with CTR criterion-based effluent limitations. Where a compliance schedule for a final effluent limitation exceeds 1 year, the Order must include interim numeric limitations for that constituent or parameter. Where allowed by the Basin Plan, compliance schedules and interim effluent limitations or discharge specifications may also be granted to allow time to implement a new or revised water quality objective. This Order includes compliance schedules and interim effluent limitations and/or discharge specifications. A detailed discussion of the basis for the compliance schedules and interim effluent limitations and/or discharge specifications is included in the Fact Sheet (Attachment F).

L. Alaska Rule. On 30 March 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards (WQS) become effective for CWA purposes. (40 C.F.R. § 131.21; 65 Fed. Reg. 24641 (27 April 2000).) Under the

revised regulation (also known as the Alaska rule), new and revised standards submitted to USEPA after 30 May 2000, must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by 30 May 2000, may be used for CWA purposes, whether or not approved by USEPA.

M. Stringency of Requirements for Individual Pollutants. This Order contains both technology-based and water quality-based effluent limitations for individual pollutants. The technology-based effluent limitations consist of restrictions on BOD_5 and TSS. The water quality-based effluent limitations consist of restrictions on aluminum, ammonia, chloride, carbon tetrachloride, chlorodibromomethane, dichlorobromomethane, iron, manganese, molybdenum, nitrate, nitrite, selenium, turbidity, pH, and pathogens. This Order's technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements. In addition, this Order contains effluent limitations more stringent than the minimum, federal technology-based requirements for secondary treatment that are necessary to meet technology-based standards. However, these limitations are not more stringent than required by the CWA because they are necessary to protect he designated uses, which are part of the water quality standards. Specifically, this Order includes effluent limitations for BOD, TSS, turbidity and pathogens that are more stringent than applicable federal technology-based standards, but that are nonetheless necessary to meet numeric objectives or protect beneficial uses. The rationale for including these limitations is explained in the Fact Sheet (Attachment F). The Regional Water Board has considered the factors in Water Code section 13241 in establishing these requirements.

Water quality-based effluent limitations have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. To the extent that toxic pollutant water quality-based effluent limitations were derived from the CTR, the CTR is the applicable standard pursuant to 40 CFR section 131.38. The scientific procedures for calculating the individual water quality-based effluent limitations are based on the CTR-SIP, which was approved by USEPA on 1 May 2001. All beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by USEPA prior to 30 May 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to 30 May 2000, but not approved by USEPA before that date, are nonetheless "*applicable water quality standards for purposes of the [Clean Water] Act*" pursuant to 40 CFR section 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the technology-based requirements of the CWA and the applicable water quality standards for purposes of the CWA.

The Discharger has estimated that the total cost of the tertiary-level treatment facility expansion, Phase 1A and Phase 1B, will be approximately $51 million. The Regional Water Board has considered the specific costs identified by the Discharger. As discussed in section IV.C.3.x. of the Fact Sheet (Attachment F), the individual pollutant restrictions are reasonably necessary to protect beneficial uses identified in the Basin

Plan, and the economic information related to costs of compliance are not sufficient, in the Regional Water Board's determination, to justify failing to protect beneficial uses.

N. **Antidegradation Policy.** 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 No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the state and federal antidegradation policies. As discussed in detail in the Fact Sheet (Attachment F, Sections III.C.2. and IV.D.4.) the permitted discharge is consistent with the antidegradation provision of section 131.12 and State Water Board Resolution No. 68-16.

O. **Anti-Backsliding Requirements. CWA** sections 402(o)(2) and 303(d)(4) and federal regulations at 40CFR section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. Some effluent limitations in this Order are less stringent that those in the previous Order. As discussed in detail in the Fact Sheet (Attachment F, Sections III.C.3. and IV.D.3), this relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations.

P. **Monitoring and Reporting.** Section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorizes the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program establishes monitoring and reporting requirements to implement federal and State requirements. This Monitoring and Reporting Program is provided in Attachment E.

Q. **Standard and Special Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with section 122.41, and additional conditions applicable to specified categories of permits in accordance with 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. The Regional Water Board has also included in this Order special provisions applicable to the Discharger. A rationale for the special provisions contained in this Order is provided in the attached Fact Sheet (Attachment F).

R. **Provisions and Requirements Implementing State Law – Not Applicable.**

S. **Notification of Interested Parties.** The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe Waste Discharge Requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet (Attachment F).

T. Consideration of Public Comment. The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. Details of the Public Hearing are provided in the Fact Sheet (Attachment F).

III. DISCHARGE PROHIBITIONS

A. Discharge of wastewater at a location or in a manner different from that described in the Findings is prohibited.

B. The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Federal Standard 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 California Water Code.

D. The Discharger shall not allow pollutant-free wastewater to be discharged into the collection, treatment, and disposal system in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means rainfall, groundwater, cooling waters, and condensates that are essentially free of pollutants.

E. The discharge of disinfected secondary treated wastewater at Discharge Point 001 is prohibited except from October 1 to May 31, when River flows provide a flow ratio equal to or greater than 20:1 (river: effluent) as a Daily Average.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations – Discharge Point 001

1. Final Effluent Limitations – Seasonal Discharge (October 1 – May 31)[2]
Unless otherwise specified, the following effluent limitations for the Seasonal Discharge are **effective immediately**. The Discharger shall maintain compliance with the following effluent limitations with compliance measured at Monitoring Locations EFF-001A, or EFF-001C when discharging combined secondary- and tertiary-level treated effluent, as described in the attached MRP (Attachment E).

a. The Discharger shall maintain compliance with the effluent limitations specified in Table 6:

[2] The seasonal discharge is only authorized in accordance with Discharge Prohibition III.E.

Table 6. Effluent Limitations – Seasonal Discharge

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
5-Day BOD @ 20 °C	mg/L	30	45	90	---	---
	lbs/day	17,514[1]	26,271[1]	52,542[1]	---	---
Total Suspended Solids	mg/L	45	60	105	---	---
	lbs/day	26,271[1]	35,028[1]	61,299[1]	---	---
Aluminum (Total)	μg/L	373	---	750	---	---
Ammonia	mg/L	0.9	---	2.1	---	---
	lbs/day	525[1]	---	1226[1]	---	---
Carbon Tetrachloride	μg/L	4.5	---	8.9	---	---
Chloride	mg/L	216	--	282		
Chlorodibromomethane	μg/L	5.0	---	14.5	---	---
Dichlorobromomethane	μg/L	9.6	---	25.7	---	---
Molybdenum (Total)	μg/L	--	---	23	---	---
Nitrate + Nitrite (as N)	mg/L	42	---	---	---	---
	lbs/day[1]	24,520	---	---	---	---
Selenium (Total)	μg/L	4.1	---	8.2	---	---
	lbs/day	2.4[1]	---	4.8[1]	---	---
pH	Std. Units	---	---	---	6.5	8.5

[1] Based on a design flow of 70 mgd.

b. **Percent Removal:** The average monthly percent removal of BOD 5-day 20°C and total suspended solids shall not be less than 85 percent.

c. **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.

d. **Total Residual Chlorine.** Effluent total residual chlorine shall not exceed:

   i. 0.01 mg/L, as a 4-day average;
   ii. 0.02 mg/L, as a 1-hour average;

e. **Total Coliform Organisms.** Effluent total coliform organisms shall not exceed:

   i. 23 most probable number (MPN) per 100 mL, as a 7-day median; and
   ii. 240 MPN/100 mL, more than once in any 30-day period.

f. **Average Daily Discharge Flow.** The Average Daily Discharge Flow shall not exceed 70 mgd.

g. **Manganese.** The discharge of total recoverable manganese shall not exceed a concentration of 50 μg/L as an annual average.

h. **Iron.** The discharge of total recoverable iron shall not exceed a concentration of 300 μg/L as an annual average.

i. **Electrical Conductivity.** The discharge of electrical conductivity shall not exceed the following[3]:

   i. **From 1 October – 31 March** the effluent electrical conductivity @ 25ºC shall not exceed 1000 µmhos/cm as a monthly average.

   ii. **From 1 April – 31 May** the effluent electrical conductivity @ 25ºC shall not exceed 700 µmhos/cm as a monthly average.

j. **Aluminum.** The discharge of total recoverable aluminum shall not exceed a concentration of 200 μg/L as an annual average.

2. Final Effluent Limitations – Year-Round Tertiary-level Treated Discharge

The following effluent limitations for the Year-Round discharge are **effective upon compliance with Special Provision VI.C.7.a.** The Discharger shall maintain compliance with the following effluent limitations with compliance measured at Monitoring Location EFF-001B, as described in the attached MRP (Attachment E).

a. The Discharger shall maintain compliance with the effluent limitations specified in Table 7:

Table 7. Effluent Limitations – Year-Round Discharge

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
5-Day BOD @ 20 °C	mg/L	10	15	20	---	---
	lbs/day	400[1]	600[1]	800[1]	---	---
Total Suspended Solids	mg/L	10	15	20	---	---
	lbs/day	400[1]	600[1]	800[1]	---	---
Ammonia	mg/L	0.9	---	2.1	---	---
	lbs/day	36[1]	---	84[1]	---	---
Aluminum (Total)	μg/L	373	---	750	---	---
Chloride	mg/L	216	---	282	---	---
Molybdenum (Total)	μg/L		---	23	---	---
Selenium (Total)	μg/L	4.1	---	8.2	---	---
	lbs/day	0.16[1]	---	0.33[1]	---	---
Nitrate (as N)	mg/L	10	---	---	---	---
	lbs/day[1]	400	---	---	---	---

[3] Compliance with final effluent limitations for Electrical Conductivity (Effluent Limitations IV.A.1.i.) is not required until 28 July 2022 or 28 July 2026, per the compliance schedule in Section VI.C.7.d.

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Nitrite (as N)	mg/L	1	---	---	---	---
	lbs/day[1]	40	---	---	---	---
pH	Std. Units	---	---	---	6.5	8.5

[1] Based on a design flow of 4.8 mgd.

b. **Percent Removal:** The average monthly percent removal of BOD 5-day 20°C and total suspended solids shall not be less than 85 percent.

c. **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.

d. **Total Coliform Organisms.** Effluent total coliform organisms shall not exceed:

   i. 2.2 most probable number (MPN) per 100 mL, as a 7-day median; and
   ii. 23 MPN/100 mL, more than once in any 30-day period; and
   iii. 240 MPN/100ml, at any time.

e. **Turbidity.** Effluent turbidity shall not exceed:

   i. 2 NTU, as a daily average; and
   ii. 5 NTU, more than 5% of the time within a 24-hour period; and
   iii. 10 NTU at any time.

f. **Average Daily Discharge Flow.** The Average Daily Discharge Flow shall not exceed 4.8 mgd.

g. **Manganese.** The discharge of total recoverable manganese shall not exceed a concentration of 50 μg/L as an annual average.

h. **Iron.** The discharge of total recoverable iron shall not exceed a concentration of 300 μg/L as an annual average.

i. **Electrical Conductivity.** The discharge of electrical conductivity shall not exceed the following[4]:

   i. **From 1 September – 31 March** the effluent electrical conductivity @ 25ºC shall not exceed 1000 µmhos/cm as a monthly average.

   ii. **From 1 April – 31 August** the effluent electrical conductivity @ 25ºC shall not exceed 700 µmhos/cm as a monthly average.

[4] Compliance with final effluent limitations for Electrical Conductivity (Effluent Limitations IV.A.2.i.) is not required until 28 July 2022 or 28 July 2026, per the compliance schedule in Section VI.C.7.d.

j. **Aluminum.** The discharge of total recoverable aluminum shall not exceed a concentration of 200 μg/L as an annual average.

3. Interim Effluent Limitations

a. **Effective Immediately and ending on 17 May 2010** for all parameters listed in Table 8 below, the Discharger shall maintain compliance with the following limitations at Discharge Point 001, with compliance measured at Monitoring Locations EFF-001A, or EFF-001C when discharging combined secondary- and tertiary-level treated effluent, 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 8. Interim Effluent Limitations

Parameter	Units	Effluent Limitations	
		Average Monthly	Daily Maximum
Chlorodibromomethane	μg/L	--	16
Dichlorobromomethane	μg/L	--	27

b. **Mercury.** The total annual mass discharge of total mercury shall not exceed 1.16 pounds.

c. **Salinity (as Electrical Conductivity). Effective immediately**, the monthly average discharge of salinity, measured as electrical conductivity, shall not exceed 1341 μmhos/cm. This interim performance-based limitation shall be in effect until the waste load allocations established in the TMDL for Salt and Boron in the Lower SJR are in effect.

d. **Ammonia. Effective immediately,** and ending 31 January 2016, the Discharger shall maintain compliance with the ammonia maximum daily effluent limitations (MDEL) listed in Table 9. These interim effluent limitations shall apply in lieu of the corresponding final effluent limitations specified for the same parameters in Table 6 and Table 7.

Table 9. pH-Dependent Effluent Limits for Ammonia

pH[1]	Total Ammonia (as N) MDEL (mg/L)
6.5	32.6
6.6	31.3
6.7	29.8
6.8	28.0
6.9	26.2
7.0	24.1
7.1	21.9
7.2	19.7
7.3	17.5
7.4	15.3
7.5	13.3
7.6	11.4
7.7	9.64
7.8	8.11
7.9	6.77
8.0	5.62
8.1	4.64
8.2	3.83
8.3	3.15
8.4	2.59
8.5	2.14
8.6	1.77
8.7	1.47
8.8	1.23
8.9	1.04
9.0	0.885

[1] Effluent pH at time of effluent ammonia sampling.

B. Land Discharge Specifications – Not Applicable

C. Reclamation Specifications – Not Applicable

V. RECEIVING WATER LIMITATIONS

A. Surface Water Limitations

Receiving water limitations are based on water quality objectives contained in the Basin Plan and are a required part of this Order. The discharge shall not cause the following in the San Joaquin River:

1. **Bacteria**. The fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, to exceed a geometric mean of 200 MPN/100 mL, nor more than ten percent of the total number of fecal coliform samples taken during any 30-day period to exceed 400 MPN/100 mL.

2. **Biostimulatory Substances**. Water to contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.

3. **Chemical Constituents**. Chemical constituents to be present in concentrations that adversely affect beneficial uses.

4. **Color**. Discoloration that causes nuisance or adversely affects beneficial uses.

5. **Dissolved Oxygen**:

    a. The monthly median of the mean daily dissolved oxygen concentration to fall below 85 percent of saturation in the main water mass;
    b. The 95 percentile dissolved oxygen concentration to fall below 75 percent of saturation; nor
    c. The dissolved oxygen concentration to be reduced below 7.0 mg/L at any time.

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

7. **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.

8. **pH**. The pH to be depressed below 6.5, raised above 8.5, nor changed by more than 0.5 units. A one-month averaging period may be applied when calculating the pH change of 0.5 units.

9. **Pesticides**:

    a. Pesticides to be present, individually or in combination, in concentrations that adversely affect beneficial uses;
    b. Pesticides to be present in bottom sediments or aquatic life in concentrations that adversely affect beneficial uses;
    c. Total identifiable persistent chlorinated hydrocarbon pesticides to be present in the water column at concentrations detectable within the accuracy of analytical methods approved by USEPA or the Executive Officer/prescribed in *Standard Methods for the Examination of Water and Wastewater, 18th Edition*, or other equivalent methods approved by the Executive Officer.
    d. Pesticide concentrations to exceed those allowable by applicable antidegradation policies (see State Water Board Resolution No. 68-16 and 40 CFR §131.12.).

e. Pesticide concentrations to exceed the lowest levels technically and economically achievable.
f. Pesticides to be present in concentration in excess of the maximum contaminant levels set forth in California Code of Regulations, Title 22, Division 4, Chapter 15/specified in Table 64444-A (Organic Chemicals) of Section 64444 of Title 22 of the California Code of Regulations.
g. Thiobencarb to be present in excess of 1.0 µg/L.

10. **Radioactivity**:

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

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

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

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

14. **Taste 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.

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

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

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

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

B. Groundwater Limitations – Not Applicable

VI. PROVISIONS

A. Standard Provisions

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

2. The Discharger shall comply with the following provisions:

   a. If the Discharger's wastewater treatment plant is publicly owned or subject to regulation by California Public Utilities Commission, it shall be supervised and operated by persons possessing certificates of appropriate grade according to Title 23, CCR, Division 3, Chapter 14.

   b. 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:

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

      - *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.

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

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

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

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

d. This Order shall be modified, or alternately revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the CWA, if the effluent standard or limitation so issued or approved:

   i. contains different conditions or is otherwise more stringent than any effluent limitation in the Order; or

   ii. controls any pollutant limited in the Order.

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

e. The provisions of this Order are severable. If any provision of this Order is found invalid, the remainder of this Order shall not be affected.

f. 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.

g. 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.

h. The discharge of any radiological, chemical or biological warfare agent or high-level, radiological waste is prohibited.

i. A copy of this Order shall be maintained at the discharge facility and be available at all times to operating personnel. Key operating personnel shall be familiar with its content.

j. Safeguard to electric power failure:

   i. The Discharger shall provide safeguards to assure that, should there be reduction, loss, or failure of electric power, the discharge shall comply with the terms and conditions of this Order.

   ii. Upon written request by the Regional Water Board the Discharger shall submit a written description of safeguards. Such safeguards may include alternate power sources, standby generators, retention capacity, operating procedures, or other means. A description of the safeguards provided shall include an analysis of the frequency, duration, and impact of power failures experienced over the past five years on effluent quality and on the capability of the Discharger to comply with the terms and conditions of the Order. The adequacy of the safeguards is subject to the approval of the Regional Water Board.

   iii. Should the treatment works not include safeguards against reduction, loss, or failure of electric power, or should the Regional Water Board not approve the existing safeguards, the Discharger shall, within ninety days of having been advised in writing by the Regional Water Board that the existing safeguards are inadequate, provide to the Regional Water Board and USEPA a schedule of compliance for providing safeguards such that in the event of reduction, loss, or failure of electric power, the Discharger shall comply with the terms and conditions of this Order. The schedule of compliance shall, upon approval of the Regional Water Board, become a condition of this Order.

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

   The technical report shall:

   i. Identify the possible sources of spills, leaks, untreated waste by-pass, and contaminated drainage. Loading and storage areas, power outage, waste treatment unit outage, and failure of process equipment, tanks and pipes should be considered.

   ii. Evaluate the effectiveness of present facilities and procedures and state when they became operational.

   iii. Predict the effectiveness of the proposed facilities and procedures and provide an implementation schedule containing interim and final dates when they will be constructed, implemented, or operational.

   The Regional Water Board, after review of the technical report, may establish conditions which it deems necessary to control accidental discharges and to

minimize the effects of such events. Such conditions shall be incorporated as part of this Order, upon notice to the Discharger.

l. A publicly owned treatment works (POTW) whose waste flow has been increasing, or is projected to increase, shall estimate when flows will reach hydraulic and treatment capacities of its treatment and disposal facilities. The projections shall be made in January, based on the last three years' average dry weather flows, peak wet weather flows and total annual flows, as appropriate. When any projection shows that capacity of any part of the facilities may be exceeded in four years, the Discharger shall notify the Regional Water Board by 31 January. A copy of the notification shall be sent to appropriate local elected officials, local permitting agencies and the press. Within 120 days of the notification, the Discharger shall submit a technical report showing how it will prevent flow volumes from exceeding capacity or how it will increase capacity to handle the larger flows. The Regional Water Board may extend the time for submitting the report.

m. 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.

n. Laboratories that perform sample analyses must be identified in all monitoring reports submitted to the Regional Water Board and USEPA.

o. The Discharger shall conduct analysis on any sample provided by USEPA as part of the Discharge Monitoring Quality Assurance (DMQA) program. The results of any such analysis shall be submitted to USEPA's DMQA manager.

p. 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.

q. All monitoring and analysis instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary, at least yearly, to ensure their continued accuracy.

r. The Discharger shall file with the Regional Water Board technical reports on self-monitoring performed according to the detailed specifications contained in the Monitoring and Reporting Program attached to this Order.

s. The results of all monitoring required by this Order shall be reported to the Regional Water Board, and shall be submitted in such a format as to allow direct comparison with the limitations and requirements of this Order. Unless otherwise specified, discharge flows shall be reported in terms of the monthly average and the daily maximum discharge flows.

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

u. 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. (CWC section 1211)

v. In the event the Discharger does not comply or will be unable to comply for any reason, with any prohibition, maximum daily effluent limitation, 1-hour average effluent limitation, or receiving water limitation contained in this Order, the Discharger shall notify the Regional Water Board by telephone (916) 464-3291 within 24 hours of having knowledge of such noncompliance, and shall confirm this notification in writing within five days, unless the Regional Water Board waives confirmation. The written notification shall include the information required by Attachment D, Section V.E.1 [40 CFR section 122.41(l)(6)(i)].

B. Monitoring and Reporting Program (MRP) Requirements

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

C. Special Provisions

1. Reopener Provisions

a. This Order may be reopened for modification, or revocation and reissuance, as a result of the detection of a reportable priority pollutant generated by routine monitoring or special conditions included in this Order. These special conditions may be, but are not limited to, fish tissue sampling, whole effluent toxicity, monitoring requirements on internal waste stream(s), and monitoring for surrogate parameters. Additional requirements may be included in this Order as a result of the special condition monitoring data.

b. Conditions that necessitate a major modification of a permit are described in CFR Part 122.62, including:

   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.

c. **Mercury.** If a TMDL program is adopted, this Order may be reopened to modify the interim mass effluent limitation (higher or lower) or impose an effluent concentration limitation if necessary to implement the provisions of the TMDL program as adopted, and approved by the State Water Board, Office of Administrative Law, and US EPA. If the Regional Water Board determines that a mercury offset program is feasible for Dischargers subject to a NPDES permit, then this Order may be reopened to reevaluate the interim mercury mass loading limitation(s) and the need for a mercury offset program for the Discharger.

d. **Whole Effluent Toxicity.** As a result of a Toxicity Reduction Evaluation (TRE), this Order may be reopened to include a chronic toxicity limitation, a new acute toxicity limitation, and/or a limitation for a specific toxicant identified in the TRE. Additionally, if 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.

e. **Water Effects Ratios (WER) and Metal Translators.** A default WER of 1.0 has been used in this Order for calculating CTR criteria and Basin Plan objectives for applicable inorganic constituents. If the Discharger performs defensible water effects ratio studies to determine site-specific WERs (e.g. aluminum or ammonia) and/or additional site-specific dissolved-to-total metal translators to address critical conditions, this Order may be reopened to modify the effluent limitations for the applicable inorganic constituents. Also, should an independent scientific peer review of the Arid West Water Quality Research Project technical report, *Evaluation of the EPA Recalculation Procedure in the Arid West Technical Report,* produce defensible findings that update the national ambient water quality criteria for aluminum, this Order may be reopened to modify the effluent limitations for aluminum.

f. **Mixing Zone Study.** In accordance with Section 1.4.2.2, the Discharger conducted a mixing zone study, which was completed in May 2003; however, the Regional Water Board determined that results of the study did not adequately demonstrate that a mixing zone would not adversely impact aquatic life. Thus, the Discharger may elect to conduct additional mixing zone studies to better evaluate any available assimilative capacity in San Joaquin River and the associated tributary channel (commonly referred to as the side-channel). When

requested, the Regional Water Board will review such studies and if warranted, may reopen this Order to modify effluent limitations or include additional requirements.

g. **Ammonia Site-specific Objective Study.** In addition to the Discharger conducting a site-specific WER study that demonstrates a less stringent standard may be warranted and/or a mixing zone study that demonstrates a dilution credit may be considered (See sections VI.C.3.e and f of this Order), the Discharger may also provide dynamic modeling using site-specific effluent and receiving water monitoring values for effluent limitation calculations. When requested, the Regional Water Board will review such studies and dynamic modeling results and if warranted, may reopen this Order to modify effluent limitations or to extend the interim compliance period if compliance is not possible with the modified or unmodified final effluent limitations.

h. **Salinity (as Electrical Conductivity).** The Final effluent limitations for salinity (as Electrical Conductivity) are based on the salinity TMDL and Basin Plan Amendment which also includes a compliance schedule of sixteen to twenty years, and is not enforceable until that time. The TMDL recognizes that compliance with the final effluent limitation will require efforts beyond traditional treatment and control, including pollutant trading and supply water allocations. Therefore, this Order may be reopened to modify the effluent limitation based on new information (e.g. amendment of the Bay Delta Plan).

2. Special Studies, Technical Reports and Additional Monitoring Requirements

a. **Chronic Whole Effluent Toxicity.** For compliance with the Basin Plan's narrative toxicity objective, this Order requires the Discharger to conduct chronic whole effluent toxicity testing, as specified in the Monitoring and Reporting Program (Attachment E, 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 toxicity numeric monitoring trigger established in this Provision, the Discharger is required to initiate a Toxicity Reduction Evaluation (TRE), in accordance with an approved TRE Work Plan, and take actions to mitigate the impact of the discharge and prevent reoccurrence 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 requirements for the Discharger to develop and submit a TRE Work Plan and includes procedures for accelerated chronic toxicity monitoring and TRE initiation.

i. **Initial Investigative Toxicity Reduction Evaluation (TRE) Work Plan. Within 90 days of the effective date of this Order,** the Discharger shall submit to the Regional Water Board an Initial Investigative TRE Work Plan for

approval by the Executive Officer. This should be a one to two page document including, at minimum:

a) A description of the investigation and evaluation techniques that will be used to identify potential causes and sources of effluent toxicity, effluent variability, and treatment system efficiency;

b) A description of the facility's methods of maximizing in-house treatment efficiency and good housekeeping practices, and a list of all chemicals used in operation of the facility; and

c) A discussion of who will conduct the Toxicity Identification Evaluation, if necessary (i.e. an in-house expert or outside contractor).

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. WET testing results exceeding the monitoring trigger during accelerated monitoring demonstrates a pattern of toxicity and requires the Discharger to initiate a TRE to address the effluent toxicity.

iii. **Numeric Monitoring Trigger.** The numeric toxicity monitoring trigger shall be as follows in Table 9:

Table 10. Numeric Toxicity Monitoring Triggers

Discharge	Trigger
Seasonal Discharge	1 TUc[1]
Year-round Discharge	1 TUc[1]

[1] TUc = 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. If the Discharger performs a mixing zone/dilution study and the permit is reopened to allow dilution credits for acute and/or chronic aquatic life criteria, in accordance with Sections VI.C.3.f. and VI.C.3.g. of this Order, the numeric monitoring trigger may be adjusted accordingly.

iv. **Accelerated Monitoring Specifications.** If the monitoring trigger is exceeded during regular chronic toxicity testing, within 14-days of notification by the laboratory of the test results, the Discharger shall initiate accelerated monitoring. Accelerated monitoring shall consist of four (4) chronic toxicity tests 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 (4) consecutive accelerated monitoring tests do not exceed the monitoring trigger, the Discharger may cease accelerated monitoring and resume regular chronic toxicity monitoring. However, notwithstanding the accelerated monitoring results, if there is adequate evidence of a pattern of effluent toxicity, the Executive Officer may require that the Discharger initiate a TRE.

b) If the source(s) of the toxicity is easily identified (i.e. temporary plant upset), the Discharger shall make necessary corrections to the facility and shall continue accelerated monitoring until four (4) consecutive accelerated tests do not exceed the monitoring trigger. Upon confirmation that the effluent toxicity has been removed, the Discharger may cease accelerated monitoring and resume regular chronic toxicity monitoring.

c) If the result of any accelerated toxicity test exceeds the monitoring trigger, the Discharger shall cease accelerated monitoring and initiate 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 the test results exceeding the monitoring trigger during accelerated monitoring, the Discharger shall submit a TRE Action Plan to the Regional Water Board including, at minimum:

   1) Specific actions the Discharger will take to investigate and identify the cause(s) of toxicity, including TRE WET monitoring schedule;
   2) Specific actions the Discharger will take to mitigate the impact of the discharge and prevent the recurrence of toxicity; and
   3) A schedule for these actions.

   Within sixty (60) days of notification by the laboratory of the test results, the Discharger shall submit to the Regional Water Board a TRE Work Plan for approval by the Executive Officer. The TRE Work Plan shall outline the procedures for identifying the source(s) of, and reducing or eliminating effluent toxicity. The TRE Work Plan must be developed in accordance with EPA guidance[5].

3. Best Management Practices and Pollution Prevention

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a. **Salinity Source Control Program.** The Discharger shall continue to implement the Salinity Source Control Program and update as necessary. The Regional Water Board finds that an annual average salinity of the water supply EC + 500 µmhos/cm as electrical conductivity (EC) is a reasonable intermediate goal that can be achieved in this permit term. The Discharger shall provide annual reports demonstrating reasonable progress in the reduction of salinity in its discharge to the San Joaquin River and to meet this goal. The annual reports shall be

[5] See Attachment F (Fact Sheet) Section VII.B.2.a. for a list of EPA guidance documents that must be considered in development of the TRE Workplan.

submitted in accordance with the Monitoring and Reporting Program (Attachment E, Section X.D.1.). The Discharger shall also participate financially in the development of the Central Valley Salinity management Plan at a level commensurate with its contributions of Salinity to the Delta.

4. Construction, Operation and Maintenance Specifications- Not Applicable

5. Special Provisions for Municipal Facilities

a. **Pretreatment Requirements.**

i. The Discharger shall implement its approved pretreatment program and the program shall be an enforceable condition of this Order. If the Discharger fails to perform the pretreatment functions, the Regional Water Board, the State Water Board or the U.S. Environmental Protection Agency (U.S. EPA) may take enforcement actions against the Discharger as authorized by the CWA.

ii. The Discharger shall enforce the Pretreatment Standards promulgated under sections 307(b), 307(c), and 307(d) of the Clean Water Act. The Discharger shall perform the pretreatment functions required by 40 CFR Part 403 including, but not limited to:

a) Adopting the legal authority required by 40 CFR 403.8(f)(1);

b) Enforcing the Pretreatment Standards of 40 CFR 403.5 and 403.6;

c) Implementing procedures to ensure compliance as required by 40 CFR 403.8(f)(2); and

d) Providing funding and personnel for implementation and enforcement of the pretreatment program as required by 40 CFR 403.8(f)(3).

iii. The Discharger shall implement, as more completely set forth in 40 CFR 403.5, the necessary legal authorities, programs, and controls to ensure that the following incompatible wastes are not introduced to the treatment system, where incompatible wastes are:

a) Wastes which create a fire or explosion hazard in the treatment works;

b) Wastes which will cause corrosive structural damage to treatment works, but in no case wastes with a pH lower than 5.0, unless the works is specially designed to accommodate such wastes;

c) Solid or viscous wastes in amounts which cause obstruction to flow in sewers, or which cause other interference with proper operation or treatment works;

d) Any waste, including oxygen demanding pollutants (BOD, *etc.*), released in such volume or strength as to cause inhibition or disruption in the treatment works, and subsequent treatment process upset and loss of treatment efficiency;

e) Heat in amounts that inhibit or disrupt biological activity in the treatment works, or that raise influent temperatures above 40°C (104°F), unless the Regional Water Board approves alternate temperature limits;

f) Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

g) Pollutants which result in the presence of toxic gases, vapors, or fumes within the treatment works in a quantity that may cause acute worker health and safety problems; and:

h) Any trucked or hauled pollutants, except at points predesignated by the Discharger.

iv. The Discharger shall implement, as more completely set forth in 40 CFR 403.5, the legal authorities, programs, and controls necessary to ensure that indirect discharges do not introduce pollutants into the sewerage system that, either alone or in conjunction with a discharge or discharges from other sources:

a) Flow through the system to the receiving water in quantities or concentrations that cause a violation of this Order, or:

b) Inhibit or disrupt treatment processes, treatment system operations, or sludge processes, use, or disposal and either cause a violation of this Order or prevent sludge use or disposal in accordance with this Order.

b. **Collection System.** On 2 May 2006, the State Water Board adopted State Water Board Order 2006-0003, a Statewide General WDR for Sanitary Sewer Systems. The Discharger shall be subject to the requirements of Order 2006-0003 and any future revisions thereto. Order 2006-0003 requires that all public agencies that currently own or operate sanitary sewer systems apply for coverage under the General WDR. The Discharger has applied for and has been approved for coverage under State Water Board Order 2006-003 for operation of its wastewater collection system.

Regardless of the coverage obtained under Order 2006-0003, the Discharger's collection system is part of the treatment system that is subject to this Order. As such, pursuant to federal regulations, the Discharger must properly operate and maintain its collection system [40 CFR section 122.41(e)], report any non-compliance [40 CFR section 122.41(l)(6) and (7)], and mitigate any discharge from the collection system in violation of this Order [40 CFR. section 122.41(d)].

6. Other Special Provisions

a. The year-round advanced treatment discharge shall be oxidized, coagulated, filtered, and adequately disinfected pursuant to the DPH reclamation criteria, California Code of Regulations, Title 22, Division 4, Chapter 3, (Title 22), or equivalent.

b. 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 Regional 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 Regional 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 California Water Code. Transfer shall be approved or disapproved in writing by the Executive Officer.

7. Compliance Schedules

a. **Tertiary-level Treated Discharge, Phase 1A.** The Discharger has requested to be permitted to discharge up to 2.3 mgd year round to the San Joaquin River upon completion of the Phase 1A upgrade. The permitted discharge flow to the San Joaquin River is subject to compliance with the following conditions:

i. **Facility Improvements.** The Discharger shall have completed construction and startup of the Phase 1A upgrades, as identified in the Fact Sheet II.E, and shall provide evidence, certified by the plant design engineer, that the plant is operating properly.

ii. **Request for Year Round Discharge.** The Discharger shall notify the Executive Officer of its compliance with item i., above. The 2.3 mgd year round discharge shall not commence until the Executive Officer verifies compliance with Special Provisions VI.C.7.a.

b. **Tertiary-level Treated Discharge, Phase 1B.** The Discharger has requested to be permitted to discharge up to 4.8 mgd year round to the San Joaquin River upon completion of the Phase 1A and Phase 1B upgrades. The permitted discharge flow to the San Joaquin River is subject to compliance with the following conditions:

i. **Facility Improvements.** The Discharger shall have completed construction and startup of the Phase 1A and Phase 1B upgrades, as identified in the Fact Sheet, Section II.E, and shall provide evidence, certified by the plant design engineer, that the plant is operating properly.

ii. **Request for Year Round Discharge.** The Discharger shall notify the Executive Officer of its compliance with item i., above. The 4.8 mgd year round discharge shall not commence until the Executive Officer verifies compliance with Special Provisions VI.C.7.b.

c. **Compliance Schedules for Final Effluent Limitations for Ammonia, Dichlorobromomethane, and Chlorodibromomethane**

i. **By 18 May 2010,** the Discharger shall comply with the final effluent limitations for chlorodibromomethane and dichlorobromomethane; and **by 1 February 2016,** the Discharger shall comply with the ammonia final effluent limitations. On 25 March 2008, the Discharger submitted a compliance schedule justification for ammonia, chlorodibromomethane, and dichlorobromomethane. On 1 September 2009, the Discharger submitted an updated compliance schedule justification for ammonia. The compliance schedule justification included all items specified in Paragraph 3, items (a) through (d), of section 2.1 of the SIP. The Regional Water Board may extend the ammonia compliance period pending the results of any reopener studies submitted as part of Section VI.C.1.g. of this Order. As this compliance schedule is greater than one year, the Discharger shall submit semi-annual progress reports in accordance with the Monitoring and Reporting Program (Attachment E, Section X.D.1.)

ii. **Corrective Action Plan/Implementation Schedule.** To assure compliance with the final effluent limitations, the Discharger shall submit to the Regional Water Board a corrective action plan and implementation for ammonia, chlorodibromomethane, and dichlorobromomethane **within 6 months of the effective date of this Order**.

iii. **Treatment Feasibility Study.** The Discharger is required to perform an engineering treatment feasibility study examining the feasibility, costs and benefits of different treatment options that may be required to remove ammonia, chlorodibromomethane, and dichlorobromomethane from the discharge. A work plan and time schedule for preparation of the treatment feasibility study shall be completed and submitted to the Regional Water Board **within 4 months of the effective date of this Order** for approval by the Executive Officer. The treatment feasibility study shall be completed and

submitted to the Regional Water Board **within one (1) year following work plan approval by the Executive Officer**.

d. **Compliance Schedule for Final Effluent Limitations for Electrical Conductivity.** The Discharger shall comply with the following time schedule to ensure compliance with the final effluent limitations for Electrical Conductivity (Effluent Limitations IV.A.1.i. and IV.A.2.i.), in accordance with the Salinity and Boron TMDL:

Task	Date Due
Submit Method of Compliance Workplan/schedule	1 June 2009
Continue Implementation of Salinity Source Control Program[1]	Ongoing
Annual Progress Reports[2]	1 September, annually until final compliance
Full compliance with final electrical conductivity effluent limitations	28 July 2022[3] or 28 July 2026[4]

[1] See Section VI.C.3.a.

[2] The progress reports shall detail what steps have been implemented towards achieving compliance with waste discharge requirements, including studies, construction progress, evaluation of measures implemented, and recommendations for additional measures as necessary to achieve full compliance by the final date.

[3] For all water year types, except critically dry.

[4] For critically dry years, full compliance not required until 28 July 2026.

VII. COMPLIANCE DETERMINATION

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

A. BOD and TSS Effluent Limitations. Compliance with the final effluent limitations for BOD and TSS required in sections IV.A.1.a, and IV.A.2.a, shall be ascertained by 24-hour composite samples. Compliance with effluent limitations required in sections IV.A.1.b., and IV.A.2.b.for percent removal shall be calculated using the arithmetic mean of 20°C BOD (5-day) and total suspended solids in effluent samples collected over a monthly period as a percentage of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period.

B. Aluminum Effluent Limitations (Sections IV.A.1, and 2.). 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 US EPA'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.

C. **Total Mercury Mass Loading Effluent Limitations.** The procedures for calculating the annual mass loading of total mercury are as follows:

1. The total pollutant mass load for each year (January 1st – December 31st) shall be determined using an average of all concentration data collected during the year and the corresponding total annual discharge flow. All effluent river discharge monitoring data collected under the monitoring and reporting program, pretreatment program, and any special studies shall be used for these calculations.
2. In calculating compliance, the Discharger shall count all non-detect measures at one-half of the detection level. If compliance with the effluent limitation is not attained due to the non-detect contribution, the Discharger shall improve and implement available analytical capabilities and compliance shall be evaluated with consideration of the detection limits.

D. **Total Coliform Organisms Effluent Limitations (Section IV.A.1.e. and IV.A.2.d)**. For each day that an effluent sample is collected and analyzed for total coliform organisms, the 7-day median shall be determined by calculating the median concentration of total coliform bacteria in the effluent utilizing the bacteriological results of the last seven days for which analyses have been completed. If the 7-day median of total coliform organisms exceeds a most probable number (MPN) specified in the Effluent Limitations, the Discharger will be considered out of compliance for that parameter for that 1 day only within the reporting period.

E. **Total Residual Chlorine (Section IV.A.1.d.).** Continuous monitoring analyzers for chlorine residual or for dechlorination agent residual in the effluent are appropriate methods for compliance determination. A positive residual dechlorination agent in the effluent indicates that chlorine is not present in the discharge, which demonstrates compliance with the effluent limitations. This type of monitoring can also be used to prove that some chlorine residual exceedances are false positives. Continuous monitoring data showing either a positive dechlorination agent residual or a chlorine residual at or below the prescribed limit are sufficient to show compliance with the total residual chlorine effluent limitations, as long as the instruments are maintained and calibrated in accordance with the manufacturer's recommendations.

Any excursion above the 1-hour average or 4-day average total residual chlorine effluent limitations is a violation. If the Discharger conducts continuous monitoring and the Discharger can demonstrate, through data collected from a back-up monitoring system, that a chlorine spike recorded by the continuous monitor was not actually due to chlorine, then any excursion resulting from the recorded spike will not be considered an exceedance, but rather reported as a false positive.

F. **Mass Effluent Limitations.** Compliance with the mass effluent limitations will only be determined during average dry weather periods when groundwater is at or near normal and runoff is not occurring.

G. **Average Daily Discharge Flow Effluent Limitations**. The Average Daily Discharge Flow represents the daily average flow when groundwater is at or near normal and

runoff is not occurring. Compliance with the Average Daily Discharge Flow effluent limitations will be determined annually based on the average daily flow over three consecutive dry weather months (e.g. July, August, and September).

ATTACHMENT A – DEFINITIONS

Acute Toxic Unit (TU_a): the reciprocal of the effluent concentration that causes 50 percent of the organisms to die in an acute toxicity test ($TU_a = 100/LC_{50}$) (see LC_{50})

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.

Best Practicable Treatment or Control (BPTC): BPTC is a requirement of State Water Resources Control Board Resolution 68-16 – "Statement of Policy with Respect to Maintaining High Quality of Waters in California" (referred to as the "Antidegradation Policy"). BPTC is the treatment or control of a discharge necessary to assure that, *"(a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained."* Pollution is defined in CWC Section 13050(l). In general, an exceedance of a water quality objective in the Basin Plan constitutes "pollution".

Bioaccumulative pollutants are 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*) 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) are those sample results less than the RL, but greater than or equal to the laboratory's MDL.

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) 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).

Estimated Chemical Concentration is the estimated chemical concentration that results from the confirmed detection of the substance by the analytical method below the ML value.

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 include~~d~~, 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.

Inhibition Concentration (IC): a point estimate of the toxicant concentration that would cause a given percent reduction in a non-lethal biological measurement (e.g. reproduction or growth), calculated from a continuous model (e.g. Interpolation Method). IC_{25} is a point estimate of the toxicant concentration that would cause a 25 percent reduction in a non-lethal biological measurement.

Inland Surface Waters are 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).

LC_{50}, Lethal Concentration, 50 percent: the toxic or effluent concentration that would cause death in 50 percent of the test organisms over a specified period of time.

LOEC, Lowest Observed Effect Concentration: the lowest concentration of an effluent or toxicant that results in adverse effects on the test organism (i.e. where the values for the observed endpoints are statistically different from the control).

Maximum Daily Effluent Limitation (MDEL) means 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 is 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) 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 title 40 of the Code of Federal Regulations, Part 136 (revised as of 3 July 1999).

Minimum Level (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 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.

NOEC, No Observed Effect Concentration: the highest tested concentration of an effluent or test sample whose effect is not different from the control effect, according to the statistical test used (see LOEC). The NOEC is usually the highest tested concentration of an effluent or toxic that causes no observable effects on the test organisms (i.e. the highest concentration of toxicity at which the values for the observed responses do not statistically differ from the controls).

Not Detected (ND) are those sample results less than the laboratory's MDL.

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

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 or Regional Water Board.

Reporting Level (RL) is the ML (and its associated analytical method) chosen by the Discharger for reporting and compliance determination from the MLs included in this Order. The MLs included in this Order correspond to approved analytical methods for reporting a sample result that are selected by the Regional Water Board either from Appendix 4 of the SIP in accordance with section 2.4.2 of the SIP or established in accordance with section 2.4.3 of the SIP. The ML is based on the proper application of method-based analytical procedures for sample preparation and the absence of any matrix interferences. Other factors may be applied to the ML depending on the specific sample preparation steps employed. For example, the treatment typically applied in cases where there are matrix-effects is to dilute the sample or sample aliquot by a factor of ten. In such cases, this additional factor must be applied to the ML in the computation of the RL.

Satellite Collection System is 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 is any water designated as municipal or domestic supply (MUN) in a Regional Water Board Basin Plan.

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

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

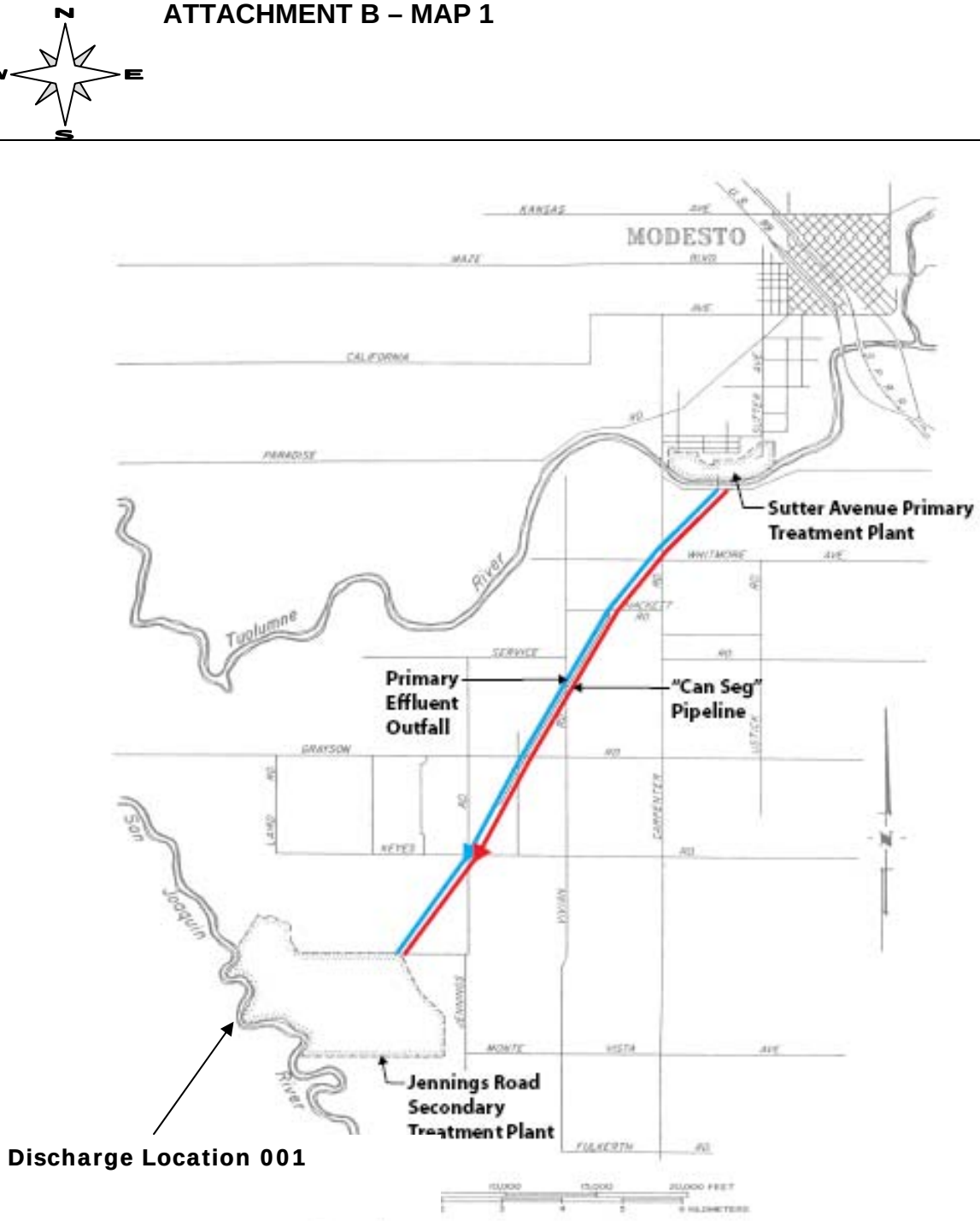
where:

x is the observed value;
μ is the arithmetic mean of the observed values; and
n is the number of samples.

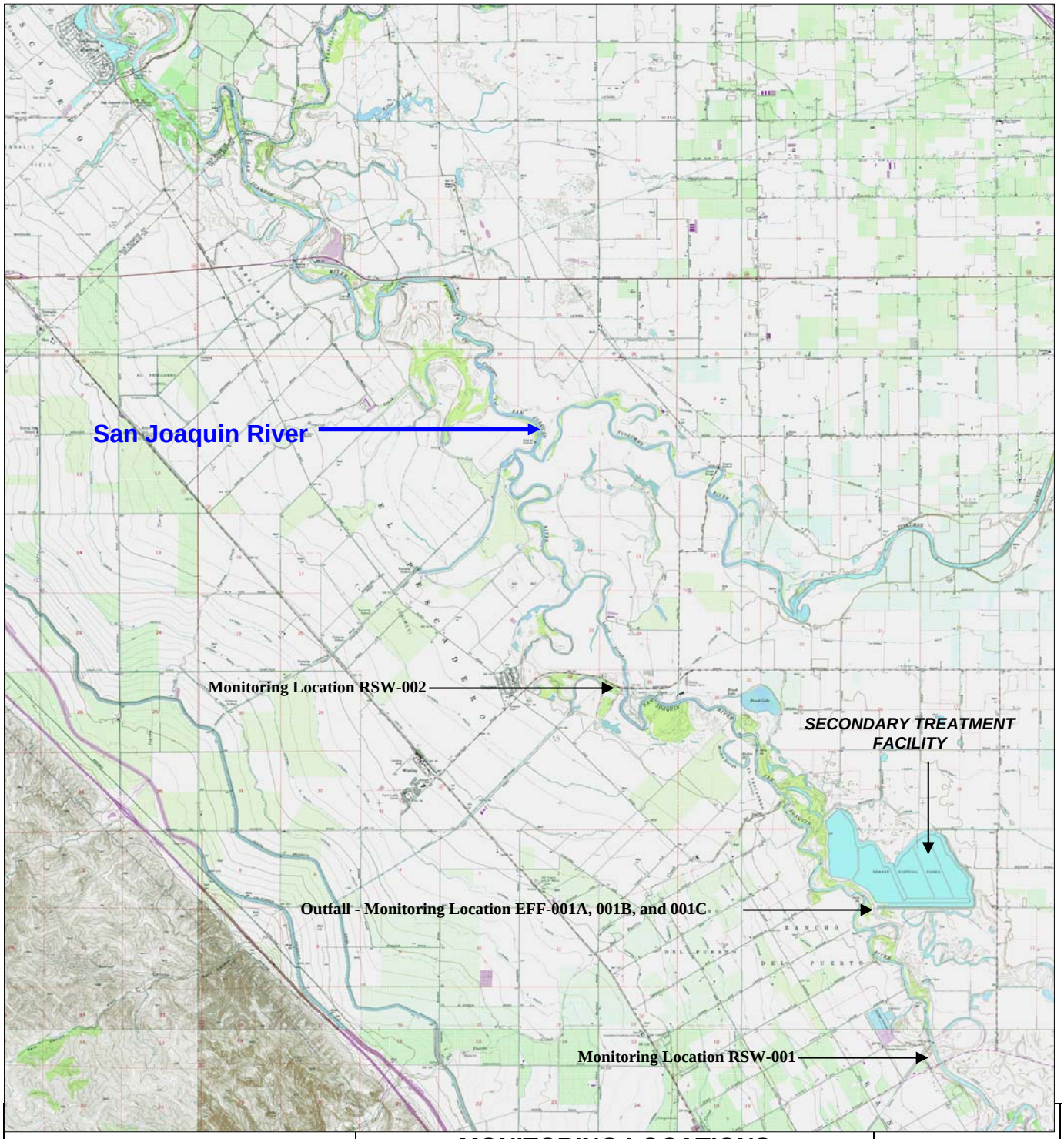
Toxicity Reduction Evaluation (TRE) is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps 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. A Toxicity Identification Evaluation (TIE) may be required as

part of the TRE, if appropriate. (A TIE is a set of procedures to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.)

ATTACHMENT B – MAP 1

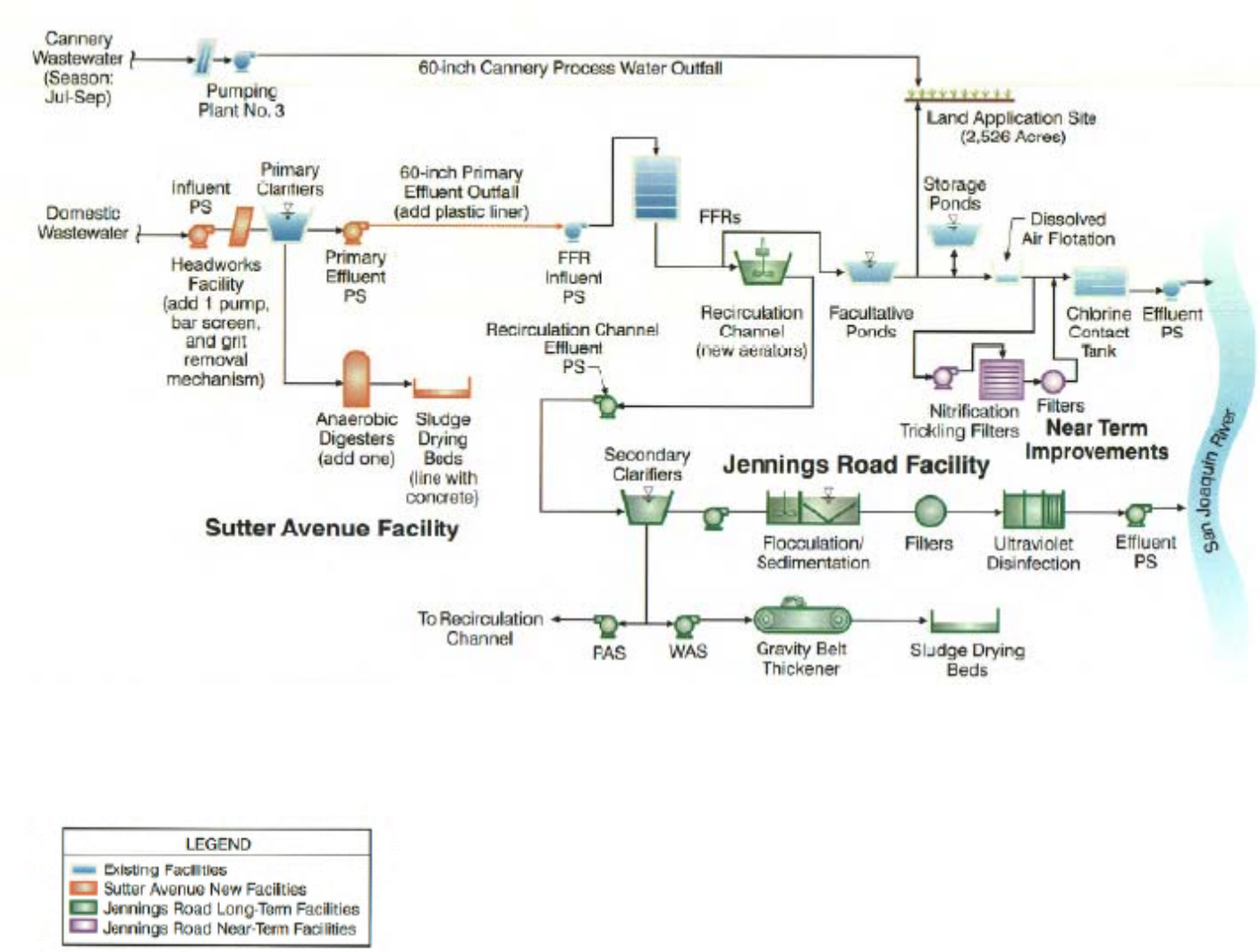


Drawing Reference: CITY OF MODESTO ENGINEER'S REPORT *Draft July 2006*	**SITE LOCATION MAP** CITY OF MODESTO WATER QUALITY CONTROL FACILITY STANISLAUS COUNTY	



ATTACHMENT B- MAP 2	**MONITORING LOCATIONS** CITY OF MODESTO WATER QUALITY CONTROL FACILITY STANISLAUS COUNTY	

ATTACHMENT C – FLOW SCHEMATIC



ATTACHMENT D –STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. (40 C.F.R. § 122.41(a).)

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 sludge 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 Regional Water Board, State Water Board, United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to (40 C.F.R. § 122.41(i); Wat. Code, § 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 (40 C.F.R. § 122.41(i)(1));

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order (40 C.F.R. § 122.41(i)(2));

3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order (40 C.F.R. § 122.41(i)(3)); 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. (40 C.F.R. § 122.41(i)(4).)

G. Bypass

1. Definitions

   a. “Bypass” means the intentional diversion of waste streams from any portion of a treatment facility. (40 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 Regional 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 Regional 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 Regional Water Board may approve an anticipated bypass, after considering its adverse effects, if the Regional Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above. (40 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 Regional Water Board. The Regional Water Board may require modification or revocation and reissuance of the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the 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 under Part 136 or, in the case of sludge use or disposal, approved under Part 136 unless otherwise specified in Part 503 unless other test procedures have been specified in this Order. (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 sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 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 Regional 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 Regional Water Board, State Water Board, or USEPA within a reasonable time, any information which the Regional Water Board, State Water Board, or USEPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the Regional Water Board, State Water Board, or USEPA copies of records required to be kept by this Order. (40 C.F.R. § 122.41(h); Wat. Code, § 13267.)

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the Regional Water Board, State Water Board, and/or USEPA shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, and V.B.5 below. (40 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 USEPA). (40 C.F.R. § 122.22(a)(3).).

3. All reports required by this Order and other information requested by the Regional Water Board, State Water Board, or USEPA shall be signed by a person described in 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 Regional 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 Regional 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. § 122.22(l)(4).)

2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Regional Water Board or State Water Board for reporting results of monitoring of sludge 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 Part 136 or, in the case of sludge use or disposal, approved under Part 136 unless otherwise specified in Part 503, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Regional 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 Regional Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours. (40 C.F.R. § 122.41(l)(6)(iii).)

F. Planned Changes

The Discharger shall give notice to the Regional Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when (40 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 not subject to effluent limitations in this Order. (40 C.F.R. § 122.41(l)(1)(ii).)

3. The alteration or addition results in a significant change in the Discharger's sludge 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 Regional Water Board or State Water Board of any planned changes in the permitted facility or activity that may result in noncompliance with General Order requirements. (40 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 Regional Water Board, State Water Board, or USEPA, the Discharger shall promptly submit such facts or information. (40 C.F.R. § 122.41(l)(8).)

VI. STANDARD PROVISIONS – ENFORCEMENT

A. The Regional 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.

VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS

A. Publicly-Owned Treatment Works (POTWs)

All POTWs shall provide adequate notice to the Regional Water Board of the following (40 C.F.R. § 122.42(b)):

1. Any new introduction of pollutants into the POTW from an indirect discharger that would be subject to sections 301 or 306 of the CWA if it were directly discharging those pollutants (40 C.F.R. § 122.42(b)(1)); and

2. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of adoption of the Order. (40 C.F.R. § 122.42(b)(2).)

3. Adequate notice shall include information on the quality and quantity of effluent introduced into the POTW as well as any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW. (40 C.F.R. § 122.42(b)(3).)

ATTACHMENT E – MONITORING AND REPORTING PROGRAM

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ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

The Code of Federal Regulations section 122.48 requires that all NPDES permits specify monitoring and reporting requirements. Water Code Sections 13267 and 13383 also authorize the Regional Water Quality Control Board (Regional Water Board) to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements, which implement the federal and state 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 this Regional Water Board.

B. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the California Department of Public Health. In the event a certified laboratory is not available to the Discharger, analyses performed by a non-certified laboratory will be accepted provided a Quality Assurance-Quality Control Program is instituted by the laboratory. A manual containing the steps followed in this program must be kept in the laboratory and shall be available for inspection by Regional Water Board staff. The Quality Assurance-Quality Control Program must conform to USEPA guidelines or to procedures approved by the Regional Water Board.

C. All analyses shall be performed in a laboratory certified to perform such analyses by the California Department of Public Health. Laboratories that perform sample analyses shall be identified in all monitoring reports.

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 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.

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
---	INF-001	**Influent to Primary Treatment Facility** 37º, 36', 37" N 121º, 00', 34" W
001	EFF-001A	**Effluent from Secondary Facility** (See Attach B, Map B-2)
001	EFF-001B	**Effluent from Tertiary-level Treatment Facility** (See Attach B, Map B-2)
001	EFF-001C	**Combined secondary- and tertiary-level treated effluent** (See Attach B, Map B-2)
---	RSW-001	**SJR Upstream at West Main Bridge** 37º, 29', 38" N 121º, 04', 50" W (See Attach B, Map B-2)
---	RSW-002	**SJR Downstream approximately 500 feet from Discharge Point 001**
---	RSW-003	**SJR Downstream approximately one mile from Discharge Point 001**
---	RSW-004	**SJR Downstream at Laird Park** 37º, 33', 43" N 121º, 09', 08" W (See Attach B, Map B-2)
---	SPL-001	**Municipal Water Supply**

III. INFLUENT MONITORING REQUIREMENTS

A. Monitoring Location INF-001

1. The Discharger shall monitor the influent to the Primary Treatment Facility at INF-001 as follows:

Table E-2. Influent Monitoring

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	mgd	Meter	Continuous	
BOD 5-day 20°C	mg/L	24-hr Composite[1]	1/day	
Suspended Solids	mg/L	24-hr Composite[1]	1/day	
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/week	
pH	Std. Units	Grab	1/week	
Ammonia	mg/L	Grab	1/month	
Aluminum, Total	µg/L	24-hr Composite[1]	1/month	
Copper, Total	µg/L	24-hr Composite[1]	1/month	

Iron, Total	µg/L	24-hr Composite[1]	1/month	
Mercury, Total	ng/L	24-hr Composite[1]	1/month	Method 1631[3]
Methylmercury	ng/L	24-hr Composite[1]	1/month	Method 1630[3]
Molybdenum, Total	µg/L	24-hr Composite[1]	1/month	
Selenium, Total	µg/L	24-hr Composite[1]	1/month	Method 7742, or later
Priority Pollutants[2]	µg/L	24-hr Composite[1]	2/year	

1 24-hour flow proportional composite.

2 Volatile samples shall be grab samples.

3 Unfiltered methylmercury 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 method detection limit of 0.02 ng/l for methylmercury and 0.2 ng/l for total mercury.

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Locations EFF-001A, EFF-001B, and EFF-001C

1. When discharging treated effluent from the Facility (e.g. either the secondary treatment facility or the tertiary-level treatment facility or a combination thereof) to the San Joaquin River, the Discharger shall monitor the final disinfected effluent at the applicable monitoring location, EFF-001A, EFF-001B, and/or EFF-001C 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-3. Effluent Monitoring

Parameter	Units	Sample Type	Minimum Sampling Frequency[9]	Required Analytical Test Method and (Minimum Level, units), respectively
Flow	mgd	Meter	Continuous	
Total Residual Chlorine[1]	mg/L	Meter	Continuous[11]	
Temperature[2]	°F	Meter	Continuous	
Dissolved Oxygen	mg/L	Meter	Continuous	
pH	Standard Units	Meter	Continuous	
BOD 5-day 20°C	mg/L	24-hr Composite[8]	1/day	
Total Suspended Solids	mg/L	24-hr Composite[8]	1/day	
Total Coliform Organisms	MPN/100 mL	Grab	1/day	
Settleable Solids	mL/L	Grab	1/week	
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/day	
Turbidity	NTU	Grab	1/week[12]	
Ammonia (as N) [3, 4]	mg/L	Grab	1/week	
Nitrate (as N)	mg/L	Grab	1/week	
Nitrite (as N)	mg/L	Grab	1/week	
Phosphorus	mg/L	Grab	1/week	

Total Dissolved Solids	mg/L	Grab	1/month	
Hardness (as $CaCO_3$)	mg/L	Grab	1/month	
Aluminum	µg/L	Grab	2/month	
Copper, Total[5]	µg/L	Grab	2/month	
Carbon Tetrachloride	µg/L	Grab	2/month	
Chloride	mg/L	Grab	2/month	
Iron, Total	µg/L	Grab	2/month	
Manganese	µg/L	Grab	2/month	
Mercury, Total	µg/L	Grab	1/month	Method 1631[10]
Methylmercury	µg/L	Grab	1/month	Method 1630[10]
Molybdenum, Total	µg/L	Grab	2/month	
Selenium, Total[5]	µg/L	Grab	2/month	Method 7742, or later
Bromoform[5]	µg/L	Grab	2/month	
Chloroform[5]	µg/L	Grab	2/month	
Chlorodibromomethane[5]	µg/L	Grab	2/month	
Dichlorobromomethane[5]	µg/L	Grab	2/month	
Boron	µg/L	Grab	1/month	
Oil and Grease	µg/L	Grab	1/month	
Total Organic Carbon	µg/L	Grab	1/month	
Chlorpyrifos	µg/L	Grab	2/year	Method 625M, Method 8141, or equivalent GC/MS method
Diazinon	µg/L	Grab	2/year	Method 625M, Method 8141, or equivalent GC/MS method
Standard Minerals[6]	mg/L	Grab	1/year	
Priority Pollutants[5, 7]	µg/L	Grab	1/year	

[1] Total chlorine residual must be monitored during discharges of secondary treated effluent with a method sensitive to and accurate at the permitted level of 0.01 mg/L.

[2] Effluent Temperature monitoring shall be at the Outfall location.

[3] Concurrent with biotoxicity monitoring.

[4] Report as total.

[5] For priority pollutant constituents with effluent limitations, detection limits shall be below the effluent limitations. If the lowest minimum level (ML) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Plan or SIP) is not below the effluent limitation, the detection limit shall be the lowest ML. For priority pollutant constituents without effluent limitations, the detection limits shall be equal to or less than the lowest ML published in Appendix 4 of the SIP.

[6] 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).

[7] Concurrent with receiving surface water sampling.

[8] 24-hour flow proportioned composite.

[9] If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all constituents listed above, except for those required to be monitored annually (i.e. Standard Minerals and Priority Pollutants), after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge. In no event shall the Discharger be required to monitor and record data more often than twice the frequencies listed in the schedule.

[10] Unfiltered methylmercury 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 method detection limit of 0.02 ng/l for methylmercury and 0.2 ng/l for total mercury.

[11] Total residual chlorine monitoring for year-round tertiary discharge (i.e. EFF-001B) shall be 1/day grab samples and is only required when chlorine is used for maintenance or other activities at the tertiary facility.

[12] Turbidity monitoring shall be continuous for year-round tertiary discharge (i.e. EFF-001B).

V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

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

1. *Monitoring Frequency* – the Discharger shall perform weekly acute toxicity testing, concurrent with effluent ammonia sampling.

2. *Sample Types* – For static non-renewal and static renewal testing, the samples shall be 24-hour flow proportional composites and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at the effluent monitoring location EFF-001A when discharging from the secondary facility orEFF-001B when discharging from the Tertiary-level Treatment facility, or EFF-001C when discharging combined effluent flows from the secondary- and tertiary-level treatment facilities.

3. *Test Species* – Test species shall be fathead minnows (*Pimephales promelas*).

4. *Methods* – The acute toxicity testing samples shall be analyzed using EPA-821-R-02-012, Fifth Edition. Temperature, total residual chlorine, 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.

6. *Ammonia Toxicity* – The acute toxicity testing may be modified to eliminate ammonia-related toxicity until **31 January 2016**, at which time the Discharger shall be required to implement the test without modifications to eliminate ammonia toxicity.

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

1. *Monitoring Frequency* – the Discharger shall perform monthly three species chronic toxicity testing.

2. *Sample Types* – Effluent samples shall be flow proportional 24-hour composites and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at the effluent monitoring location specified in the Monitoring and Reporting Program. The receiving water control shall be a grab sample obtained from the RSW-001 sampling location, as identified in the Monitoring and Reporting Program.

3. *Sample Volumes* – Adequate sample volumes shall be collected to provide renewal water to complete the test in the event that the discharge is intermittent.

4. *Test Species* – Chronic toxicity testing measures sublethal (e.g. reduced growth, reproduction) and/or lethal effects to test organisms exposed to an effluent compared to that of the control organisms. The Discharger shall conduct chronic toxicity tests with:

   - The cladoceran, water flea, *Ceriodaphnia dubia* (survival and reproduction test);
   - The fathead minnow, *Pimephales promelas* (larval survival and growth test); and
   - 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* – For regular chronic toxicity testing it is not necessary to perform the test using a dilution series. The test may be performed using 100% effluent. For accelerated and/or TRE monitoring, the chronic toxicity testing shall be performed

using the dilution series identified in Table E-4a or E-4b, below. The receiving water control shall be used as the diluent (unless the receiving water is toxic, in which case laboratory control water may be used. The receiving water must still be tested).

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 Special Provisions VI.C.2.c.iii)

9. *Ammonia Toxicity* – The chronic toxicity testing may be modified to eliminate ammonia-related toxicity until **31 January 2016**, at which time the Discharger shall be required to implement the test without modifications to eliminate ammonia toxicity.

Table E-4a. Chronic Toxicity Testing Dilution Series – Seasonal Discharge

Sample	Dilutions (%)					Controls	
	100	75	50	25	12.5	Receiving Water	Laboratory Water
% Effluent	100	75	50	25	12.5	0	0
% Receiving Water	0	25	50	75	87.5	100	0
% Laboratory Water	0	0	0	0	0	0	100

Table E-4b. Chronic Toxicity Testing Dilution Series – Year-Round Discharge

Sample	Dilutions (%)					Controls	
	100	75	50	25	12.5	Receiving Water	Laboratory Water
% Effluent	100	75	50	25	12.5	0	0
% Receiving Water	0	25	50	75	87.5	100	0
% Laboratory Water	0	0	0	0	0	0	100

C. **WET Testing Notification Requirements**. The Discharger shall notify the Regional Water Board within 24-hrs 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. At a minimum, whole effluent toxicity monitoring shall be reported as follows:

1. **Chronic WET Reporting.** Regular chronic toxicity monitoring results shall be reported to the Regional Water Board within 30 days following completion of the test, and shall contain, at minimum:

   a. The results expressed in TUc, measured as 100/NOEC, and also measured as $100/LC_{50}$, $100/EC_{25}$, $100/IC_{25}$, and $100/IC_{50}$, as appropriate.

   b. The statistical methods used to calculate endpoints;

   c. The statistical output page, which includes the calculation of the percent minimum significant difference (PMSD);

   d. The dates of sample collection and initiation of each toxicity test; and

   e. The results compared to the numeric toxicity monitoring trigger.

   Additionally, the monthly discharger 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 quarterly, monthly, accelerated, or TRE.

2. **Acute WET Reporting.** Acute toxicity test results shall be submitted with the monthly discharger self-monitoring reports and reported as percent survival.

3. **TRE Reporting.** Reports for Toxicity Reduction Evaluations shall be submitted in accordance with the schedule contained in the Discharger's approved TRE Work Plan.

4. **Quality Assurance (QA).** The Discharger must provide the following information for QA purposes:

   a. Results of the applicable reference toxicant data with the statistical output page giving the species, NOEC, LOEC, type of toxicant, dilution water used, concentrations used, PMSD, and dates tested.

   b. The reference toxicant control charts for each endpoint, which include summaries of reference toxicant tests performed by the contracting laboratory.

   c. Any information on deviations or problems encountered and how they were dealt with.

VI. LAND DISCHARGE MONITORING REQUIREMENTS- NOT APPLICABLE

VII. RECLAMATION MONITORING REQUIREMENTS – NOT APPLICABLE

VIII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER AND GROUNDWATER

A. Monitoring Locations

1. When discharging from either the secondary treatment facility or the tertiary-level treatment facility, the Discharger shall monitor the San Joaquin River as follows:

Table E-5. Receiving Water Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Monitoring Location
Flow Ratio SJR Flow: Effluent Flow		Calculation	1/day	RSW-001 EFF-001A, or EFF-001C
Dissolved Oxygen	mg/L	Grab	1/week	RSW-001 RSW-002 RSW-003 RSW-004
pH	Standard Units	Grab	1/week	RSW-001, 002
Temperature	°F (°C)	Grab	1/week	RSW-001 002
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/week	RSW-001 RSW-002 RSW-003 RSW-004
Turbidity	NTU	Grab	1/week	RSW-001, 002
Fecal Coliform Organisms	MPN/100 ml	Grab	1/month	RSW-001, 002
Ammonia (as N) [1]	Mg/L	Grab	1/month	RSW-001 RSW-002 RSW-003 RSW-004
Total Suspended Solids	mg/L	Grab	1/month	RSW-001, 002
Total Dissolved Solids	mg/L	Grab	1/month	RSW-001, 002
Hardness (as $CaCO_3$)	mg/L	Grab	1/month	RSW-001, 002
Aluminum, Total	µg/L	Grab	1/month	RSW-001, 002
Copper, Total[2]	µg/L	Grab	1/month	RSW-001, 002
Iron, Total	µg/L	Grab	1/month	RSW-001, 002
Mercury, Total[4]	µg/L	Grab	1/quarter	RSW-001, 002
Methylmercury[4]	ng/L	Grab	1/quarter	RSW-001, 002
Molybdenum, Total	µg/L	Grab	1/month	RSW-001, 002
Selenium, Total[2,5]	µg/L	Grab	1/month	RSW-001, 002

Trihalomethanes[2, 3]	µg/L	Grab	1/month	RSW-001, 002
BOD_5 @ 20°C	mg/L	Grab	1/month	RSW-001, 002
Nitrate	mg/L	Grab	1/quarter	RSW-001, 002
Phosphorus	mg/L	Grab	1/quarter	RSW-001, 002
Standard Minerals[6]	mg/L	Grab	1/year	RSW-001, 002
Priority Pollutants[2,7]	µg/L	Grab	1/year	RSW-001, 002

[1] Temperature and pH shall be determined at the time of sample collection.

[2] For priority pollutant constituents with effluent limitations, detection limits shall be below the effluent limitations. If the lowest minimum level (ML) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Plan or SIP) is not below the effluent limitation, the detection limit shall be the lowest ML. For priority pollutant constituents without effluent limitations, the detection limits shall be equal to or less than the lowest ML published in Appendix 4 of the SIP.

[3] Trihalomethanes include bromoform, chloroform, dichlorobromomethane, and chlorodibromomethane. Concentrations of each constituent shall be separately monitored and reported.

[4] Unfiltered methylmercury 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 method detection limit of 0.02 ng/l for methylmercury and 0.2 ng/l for total mercury.

[5] Use Method 7742, or later, for Selenium.

[6] 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) .

[7] Concurrent with effluent sampling.

B. Groundwater Monitoring – Not Applicable

IX. OTHER MONITORING REQUIREMENTS

A. Municipal Water Supply

1. Monitoring Location SPL-001

The Discharger shall monitor the Municipal Water Supply at SPL-001 as follows. A sampling station shall be established where a representative sample of the municipal water supply can be obtained (see Table E-6 regarding weighted average of multiple locations and sources).

Table E-6. Municipal Water Supply Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Total Dissolved Solids[1]	mg/L	Grab	1/quarter	
Electrical Conductivity @ 25°C[1]	µmhos/cm	Grab	1/quarter	
Standard Minerals[2]	mg/L	Grab	1/year	

[1] If the water supply is from more than one source, the EC/TDS shall be reported as a weighted average and include copies of supporting calculations.

[2] 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).

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

4. The Discharger shall report to the Regional 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.

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

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

   a. Sample results greater than or equal to the RL shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).

   b. Sample results less than the RL, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

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

c. Sample results less than the laboratory's MDL shall be reported as "Not Detected," or ND.

d. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from *extrapolation* beyond the lowest point of the calibration curve.

6. **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.

B. Self Monitoring Reports (SMRs)

1. At any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). Until such notification is given, the Discharger shall submit hard copy SMRs. The CIWQS Web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

2. Monitoring results shall be submitted to the Regional Water Board by the **first day** of the second month following sample collection. Quarterly and annual monitoring results shall be submitted by the **first day of the second month following each calendar quarter, semi-annual period, and year**, respectively.

3. In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the discharge complies with waste discharge requirements. The highest daily maximum for the month, monthly and weekly averages, and medians, and

removal efficiencies (%) for BOD and Total Suspended Solids, shall be determined and recorded as needed to demonstrate compliance.

4. With the exception of flow, all constituents monitored on a continuous basis (metered), shall be reported as daily maximums, daily minimums, and daily averages; flow shall be reported as the total volume discharged per day for each day of discharge.

5. If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the discharge monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.

6. A letter transmitting the self-monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions.

7. SMRs must be submitted to the Regional Water Board, signed and certified as required by the Standard Provisions (Attachment D), to the address listed below:

   Regional Water Quality Control Board
   Central Valley Region
   11020 Sun Center Dr., Suite #200
   Rancho Cordova, CA 95670-6114

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

Table E-7. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On…	Monitoring Period	SMR Due Date
Continuous	**First day of calendar month following effective date of this Order**	**All**	Submit with monthly SMR
Hourly	**First day of calendar month following effective date of this Order**	**Hourly**	Submit with monthly SMR
Daily	**First day of calendar month following effective date of this Order**	**(Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.**	Submit with monthly SMR

Weekly	**First Sunday following first day of calendar month following permit effective date**	**Sunday through Saturday**	Submit with monthly SMR
Monthly	**First day of calendar month following permit effective date**	**1st day of calendar month through last day of calendar month**	First day of second calendar month following month of sampling
Quarterly	**Closest of January 1, April 1, July 1, or October 1 following (or on) permit effective date**	**January 1 through March 31** **April 1 through June 30** **July 1 through September 30** **October 1 through December 31**	May 1 of the same year August 1 of the same year November 1 of the same year February 1 of the next year
Semiannually	**Closest of January 1 or July 1 following (or on) permit effective date**	**January 1 through June 30** **July 1 through December 31**	August 1 of the same year February 1 of the next year
Annually	**January 1 following (or on) permit effective date**	**January 1 through December 31**	February 1 of the next year

C. Discharge Monitoring Reports (DMRs)

1. As described in Section X.B.1 above, at any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit SMRs that will satisfy federal requirements for submittal of Discharge Monitoring Reports (DMRs). Until such notification is given, the Discharger shall submit DMRs in accordance with the requirements described below.

2. DMRs must be signed and certified as required by the standard provisions (Attachment D). The Discharge shall submit the original DMR and one copy of the DMR to the address listed below:

   State Water Resources Control Board
   Discharge Monitoring Report Processing Center
   Post Office Box 671
   Sacramento, CA 95812

3. All discharge monitoring results must be reported on the official USEPA pre-printed DMR forms (EPA Form 3320-1). Forms that are self-generated or modified cannot be accepted.

D. Other Reports

1. **Progress Reports.** As specified in the compliance time schedules required in Special Provisions VI.C.7.c, progress reports shall be submitted in accordance with the following reporting requirements. At minimum, the progress reports shall include a discussion of the status of final compliance, whether the Discharger is on schedule to meet the final compliance date, and the remaining tasks to meet the final compliance date.

Table E-8. Reporting Requirements for Special Provisions Progress Reports

Special Provision	Reporting Requirements
Compliance Schedules for Final Effluent Limitations for ammonia, chlorodibromomethane, and dichlorobromomethane compliance with final effluent limitations. (section VI.C.7.c.)	**1 September**, annually, until final compliance
Salinity Source Control Program and Goal (section VI.C.3.a.)	**1 September, annually**

2. Within **60 days** of permit adoption, the Discharger shall submit a report outlining minimum levels, method detection limits, and analytical methods for approval, with a goal to achieve detection levels below applicable water quality criteria. At a minimum, the Discharger shall comply with the monitoring requirements for CTR constituents as outlined in Section 2.3 and 2.4 of the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*, adopted 2 March 2000 by the State Water Resources Control Board.

3. The Discharger's sanitary sewer system collects wastewater using sewers, pipes, pumps, and/or other conveyance systems and directs the raw sewage to the wastewater treatment plant. A "sanitary sewer overflow" is defined as a discharge to ground or surface water from the sanitary sewer system at any point upstream of the wastewater treatment plant. Sanitary sewer overflows are prohibited by this Order. All violations must be reported as required in Standard Provisions. Facilities (such as wet wells, regulated impoundments, tanks, highlines, *etc.*) may be part of a sanitary sewer system and discharges to these facilities are not considered sanitary sewer overflows, provided that the waste is fully contained within these temporary storage facilities.

4. **Annual Operations Report**. By **30 January** of each year, the Discharger shall submit a written report to the Executive Officer containing the following:

   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 Regional Water Board with both tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the compliance record. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

5. **Annual Pretreatment Reporting Requirements.** The Discharger shall submit annually a report to the Regional Water Board, with copies to US EPA Region 9 and the State Water Board, describing the Discharger's pretreatment activities over the previous 12 months. In the event that the Discharger is not in compliance with any conditions or requirements of this Order, including noncompliance with pretreatment audit/compliance inspection requirements, then the Discharger shall also include the reasons for noncompliance and state how and when the Discharger shall comply with such conditions and requirements.

   An annual report shall be submitted by **28 February** and include at least the following items:

   a. A summary of analytical results from representative, flow proportioned, 24-hour composite sampling of the POTW's influent and effluent for those pollutants EPA has identified under Section 307(a) of the CWA which are known or suspected to be discharged by industrial users.

      Sludge shall be sampled during the same 24-hour period and analyzed for the same pollutants as the influent and effluent sampling and analysis. The sludge analyzed shall be a composite sample of a minimum of 12 discrete samples taken at equal time intervals over the 24-hour period. Wastewater and sludge sampling and analysis shall be performed at least annually. The discharger shall also provide any influent, effluent or sludge monitoring data for nonpriority pollutants which may be causing or contributing to Interference, Pass-Through or adversely impacting sludge quality. Sampling and analysis shall be performed in accordance with the techniques prescribed in 40 CFR 136 and amendments thereto.

   b. A discussion of Upset, Interference, or Pass-Through incidents, if any, at the treatment plant, which the Discharger knows or suspects were caused by industrial users of the POTW. The discussion shall include the reasons why the

incidents occurred, the corrective actions taken and, if known, the name and address of, the industrial user(s) responsible. The discussion shall also include a review of the applicable pollutant limitations to determine whether any additional limitations, or changes to existing requirements, may be necessary to prevent Pass-Through, Interference, or noncompliance with sludge disposal requirements.

c. The cumulative number of industrial users that the Discharger has notified regarding Baseline Monitoring Reports and the cumulative number of industrial user responses.

d. An updated list of the Discharger's industrial users including their names and addresses, or a list of deletions and additions keyed to a previously submitted list. The Discharger shall provide a brief explanation for each deletion. The list shall identify the industrial users subject to federal categorical standards by specifying which set(s) of standards are applicable. The list shall indicate which categorical industries, or specific pollutants from each industry, are subject to local limitations that are more stringent than the federal categorical standards. The Discharger shall also list the noncategorical industrial users that are subject only to local discharge limitations. The Discharger shall characterize the compliance status through the year of record of each industrial user by employing the following descriptions:

   i. complied with baseline monitoring report requirements (where applicable);
   ii. consistently achieved compliance;
   iii. inconsistently achieved compliance;
   iv. significantly violated applicable pretreatment requirements as defined by 40 CFR 403.8(f)(2)(vii);
   v. complied with schedule to achieve compliance (include the date final compliance is required);
   vi. did not achieve compliance and not on a compliance schedule; and
   vii. compliance status unknown.

   A report describing the compliance status of each industrial user characterized by the descriptions in items iii. through vii. above shall be submitted for each calendar quarter **within 21 days of the end of the quarter**. The report shall identify the specific compliance status of each such industrial user and shall also identify the compliance status of the POTW with regards to audit/pretreatment compliance inspection requirements. If none of the aforementioned conditions exist, at a minimum, a letter indicating that all industries are in compliance and no violations or changes to the pretreatment program have occurred during the quarter must be submitted. The information required in the fourth quarter report shall be included as part of the annual report. This quarterly reporting requirement shall commence upon issuance of this Order.

e. A summary of the inspection and sampling activities conducted by the Discharger during the past year to gather information and data regarding the industrial users. The summary shall include:

i. the names and addresses of the industrial users subjected to surveillance and an explanation of whether they were inspected, sampled, or both and the frequency of these activities at each user; and
ii. the conclusions or results from the inspection or sampling of each industrial user.

f. A summary of the compliance and enforcement activities during the past year. The summary shall include the names and addresses of the industrial users affected by the following actions:

i. Warning letters or notices of violation regarding the industrial users' apparent noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the apparent violation concerned the federal categorical standards or local discharge limitations.
ii. Administrative orders regarding the industrial users noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations.
iii. Civil actions regarding the industrial users' noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations.
iv. Criminal actions regarding the industrial users noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations.
v. Assessment of monetary penalties. For each industrial user identify the amount of the penalties.
vi. Restriction of flow to the POTW.
vii. Disconnection from discharge to the POTW.

g. A description of any significant changes in operating the pretreatment program which differ from the information in the Discharger's approved Pretreatment Program including, but not limited to, changes concerning: the program's administrative structure, local industrial discharge limitations, monitoring program or monitoring frequencies, legal authority or enforcement policy, funding mechanisms, resource requirements, or staffing levels.

h. A summary of the annual pretreatment budget, including the cost of pretreatment program functions and equipment purchases.

Duplicate signed copies of these Pretreatment Program reports shall be submitted to the Regional Water Board and the:

State Water Resources Control Board
Division of Water Quality
P.O. Box 944213

Sacramento, CA 94244-2130

and the

Regional Administrator
U.S. Environmental Protection Agency W-5
75 Hawthorne Street
San Francisco, CA 94105

ATTACHMENT F – FACT SHEET

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ATTACHMENT F – FACT SHEET

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

This Order 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	**5C500102001**
Discharger	City of Modesto
Name of Facility	City of Modesto Water Quality Control Facility
Facility Address	1221 Sutter Ave Modesto, CA 95351 Stanislaus
Facility Contact, Title and Phone	Gary DeJesus, Deputy Director, Public Works (209) 577-6300
Authorized Person to Sign and Submit Reports	Gary DeJesus, Deputy Director, Public Works (209) 577-6300
Mailing Address	SAME
Billing Address	SAME
Type of Facility	Publicly-Owned Domestic Wastewater Treatment Works
Major or Minor Facility	Major
Threat to Water Quality	1
Complexity	A
Pretreatment Program	Yes
Reclamation Requirements	Regulated under waste discharge requirements, Order No. 99-112
Facility Permitted Flow	70 million gallons per day (mgd), Disinfected Secondary Treated Wastewater (Discharge permitted only during the period from 1 Oct through 30 May) 4.8 mgd, Title 22 Tertiary-level (or Equivalent) Treated Wastewater
Facility Design Flow	70 mgd Secondary treatment capacity 4.8 mgd Tertiary treatment capacity
Watershed	San Joaquin River Watershed
Receiving Water	San Joaquin River
Receiving Water Type	Inland surface water tributary to Sacramento-San Joaquin Delta

A. The City of Modesto (hereinafter Discharger) owns and operates the City of Modesto Water Quality Control Facility (hereinafter Facility), a Publicly-Owned Domestic Wastewater Treatment Works.

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 Facility discharges wastewater to the San Joaquin River, a water of the United States (hereinafter SJR), and is currently regulated by Order No. 5-01-120 which was adopted on 11 May 2001, and expired on 1 May 2006. The terms and conditions of Order No. 5-01-120 have been automatically continued and remain in effect until new Waste Discharge Requirements and NPDES permit are adopted pursuant to this Order.

C. The Discharger filed a report of waste discharge and submitted an application for renewal of its Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permit on 10 November 2005. On 4 April 2006, the Discharger submitted an amendment to the Report of Waste Discharge requesting a year-round discharge of up to 10 mgd of Title 22 tertiary (or equivalent) treated wastewater from the Facility to the SJR. The application was deemed complete on 21 April 2006. Subsequent communications from the Discharger, including a letter dated 8 November 2006, and the June 2007 antidegradation analysis included only a 4.8 mgd total year-round tertiary discharge.

II. FACILITY DESCRIPTION

The Discharger provides sewerage service for the City of Modesto, the community of Empire, and a portion of the City of Ceres, serving a population of approximately 224,000. In addition to domestic wastewater, the Discharger operates a pretreatment program that has issued seventeen liquid waste hauler permits, two groundwater clean-up permits, and fifty industrial wastewater permits. The Discharger's collection system consist of approximately 525 miles of sewer lines, which collect and convey an average dry weather flow of 26.6 million gallons per day to the Facility.

The collection system is regulated under State Water Board Order 2006-003. However, limited portions of the wastewater collection system are outside of the Discharger's service area, and therefore the Discharger established requirements for these collection system users to assure protection of the entire collection system.

The Facility consists of separate primary and secondary treatment facilities. The primary treatment facility, located at 1221 Sutter Avenue, provides primary treatment of the raw wastewater, and then transfers the treated effluent to the secondary treatment facility, located approximately 6.5 miles to the southwest at 7007 Jennings Road.

A. Description of Wastewater and Biosolids Treatment or Controls

The primary treatment plant influent pump station and headworks structures provide pumping, screening, grit removal, and flow measurement of the influent. The primary treatment facility has a design treatment capacity of 62.5 mgd, and a design hydraulic capacity of 80 mgd. Wastewater is pumped into the headworks by constant-speed screw pumps. From the pumps, wastewater passes through four climber-type mechanical bar screens. Screenings are dropped to a continuous conveyor for transfer to a compactor for additional dewatering. Wastewater flow from the screens passes to one of three grit chambers, where the separated grit slurry is pumped to cyclone separators for additional dewatering. Once through the grit chambers, wastewater flow is measured by parshall flumes and then distributed to one of two primary clarifiers. Sludge from the clarifiers is transferred to thickeners, then processed and stabilized through digesters. Digested sludge is transferred to holding tanks where it is periodically drawn to unlined drying beds, with supernatant flows routed to the septage disposal station for blending with influent wastewater. The Discharger applies the stabilized sludge as a soil amendment on the City's 2,526 agricultural fields, which is regulated by separate waste discharge requirements, Order No. 94-030.

After clarification, primary effluent is directed to the secondary treatment facility, where approximately half of the primary effluent receives treatment with fixed film reactors (FFR's) and then is combined with primary effluent in an aerated recirculation channel. Flow in the recirculation channel is then distributed to three parallel facultative ponds for further treatment, and then transferred to one of two storage ponds until it can be discharged to the SJR (1 Oct – 31 May, with 20:1 flow ratio, receiving water: effluent) or applied to the City's 2,526 acre ranch at agronomic rates. Prior to discharge to the SJR, the secondary-level treated effluent is disinfected with chlorine in a contact basin, then dechlorinated with sulfur dioxide. The secondary treatment facility has a peak hydraulic treatment capacity of 70 mgd. Attachment C provides a flow schematic of the Facility. The Discharger is proposing to construct Phase 1A and Phase 1B of a new advanced treatment facility capable of discharging up to 4.8 mgd of tertiary (or equivalent) treated wastewater year-round from the Discharge Point 001.

Since 1999, the City has been separating cannery wastes from the domestic wastewater. A separate 60-inch outfall transports cannery wastewaters to the ranch land located next to the secondary-level treatment facility. The cannery wastewater is applied directly to the ranch land at agronomic rates during the canning season (July – September). Land application of cannery and secondary wastewaters to the ranch land are regulated by separate waste discharge requirements, Order No. 99-112.

B. Discharge Points and Receiving Waters

1. Both the primary and secondary facilities are in Section 4, T5S, R8E, MDB&M, as shown in Attachment B (Figure B-1).

2. From 1 Oct through 31 May, up to 70 mgd of secondary-level treated, disinfected effluent may be discharged under conditions of a minimum 20 to 1 flow ratio (receiving water: effluent) from Discharge Point 001 (see table on cover page) to the

SJR, a water of the United States, in the reach between the mouth of the Merced River and Vernalis, within Hydrologic Unit 535/541, at a point Latitude 37º, 31', 20" N and longitude 121º, 05', 47" W. Attachment B provides a map of the area surrounding the Facility.

3. The SJR is a major tributary to the Sacramento-San Joaquin Delta that drains approximately 8.7 million acres in California's Central Valley. The SJR watershed is bounded by the Sierra Nevada Mountains on the east, the Coast Ranges on the west, the Delta to the north, and the Tulare Lake Basin to the south. From its source in the Sierra Nevada Mountains, the SJR flows southwesterly until it reaches Friant Dam. Below Friant Dam, the SJR flows westerly to the center of the San Joaquin Valley near Mendota, where it turns northwesterly to eventually join the Sacramento River in the Delta. The main stem of the entire SJR is about 300 miles long and drains approximately 13,500 square miles. Most of the valley floor is agricultural land, with an agricultural history dating to the 1870's. Prior to major water developments, the SJR supported a superlative Chinook salmon fishery (SWRCB, 1987). The SJR is also an important drinking water source for the state, as SJR flows account for approximately 15% of the total flows in the Delta.

   The hydrology of the SJR is complex and highly managed through the operation of dams, diversions, and supply conveyances. Water development has fragmented the watershed and greatly altered the natural hydrograph of the river. Runoff from the Sierra Nevada and foothills is regulated and stored in a series of reservoirs on the east side of the SJR. There are fifty-seven major reservoirs in the basin that have the capacity to store one thousand acre-feet (taf) of water. Operation of these reservoirs greatly influence the water quantity and quality of the SJR.

   Most of the natural flows from the Upper SJR and its headwaters are diverted at the Friant Dam to irrigate crops outside the SJR basin. Water is imported to the basin from the southern Delta via the Delta Mendota Canal (DMC) to replace flows that are diverted out of the basin to the south. Some water in the DMC is delivered directly to the west side of the SJR for agricultural supply, but the majority of DMC water is delivered to the Mendota Pool. Storage in the Mendota Pool is augmented by groundwater pumping from the adjacent aquifer and from incidental upstream releases from Millerton Lake. Water from the Mendota Pool is released to the Lower SJR, and various agricultural users divert water between the Mendota Pool and Sack Dam. Most or all of the remaining flow in the SJR is diverted at Sack Dam. As a result, the SJR downstream of the Sack Dam and upstream of Bear Creek frequently has little or no flow except during flood flows. During non-flood flow periods, this reach of the SJR flows intermittently and is composed of groundwater accretions and agricultural return flows. The SJR downstream of Bear Creek once again becomes a permanent stream that flows all year.

   The mean annual flow for the SJR Basin, as measured at a gaging station near Vernalis, was a little over 3 million acre-feet per year (maf/yr) between 1930 and 1998. The lowest annual flow, of approximately 400 thousand acre-feet per year (taf), occurred in 1977, and the highest annual flow, of over 15 maf occurred in 1983. The fifteen-year moving average of the mean annual flow is used by various

agencies to identify the long-term trends that may be obscured by the annual variability of the flow. The moving average in the 1950's decreased significantly following the completion of Friant Dam, and in the late 1990's, the moving average was approximately 800 taf/yr.

C. Summary of Existing Requirements and Self-Monitoring Report (SMR) Data

Effluent limitations contained in the existing Order for discharges from Discharge Point 001 (Monitoring Location EFF-001) and representative monitoring data from the term of the previous Order are as follows:

Table F-2. Historic Effluent Limitations and Monitoring Data

Parameter	Units	Effluent Limitation			Monitoring Data (Dec 01 – Oct 05)	
		Average Monthly	**Average Weekly**	**Maximum Daily**	Average Monthly	Maximum Daily
BOD	mg/L	30	45	90	9.6	48
TSS	mg/L	45	60	105	17	70
Settleable Solids	ml/L	0.1	---	0.2	< 0.1	<0.1
Ammonia	mg/L	(1)	---	(1)	5.5	27
Chlorine Residual	mg/L	---	---	0.02	< 0.02	3.3 (19 min)
Total Coliform	MPN/ 100mL	23 (Median)	---	500	< 2.2 (median)	≥ 1600 MPN/100 mL
Selenium	µg/L	4.1	---	8.2	0.9	6.0
Copper	µg/L	(2)	---	(2)	2.6	11
Molybdenum	µg/L	10	---	21	10.9	21

(1) Dependent on pH
(2) Dependent on receiving water hardness

D. Compliance Summary

The Discharger reported the following effluent limitation violations for the period of January 2001 through March 2006:

Date	Constituent	Reported Result	Effluent Limitation
3 May 02	Total Coliform	≥ 1600 MPN/100 mL	500 MPN/100 mL (Daily Maximum)
9 May 02	Chlorine Residual	3.3 mg/L, 19 min	0.02 mg/L Daily Maximum
8 Mar 05	Total Coliform	900 MPN/100 mL	500 MPN/100 mL (Daily Maximum)
30 Mar 05	Total Coliform	1600 MPN/100 mL	500 MPN/100 mL (Daily Maximum)

Notice of Violation letters regarding these instances were sent to the Discharger on 13 May 2003, and on 29 July 2005.

E. Planned Changes

The Discharger has evaluated an advanced treatment process that would accommodate a year-round surface water discharge. The proposed advanced treatment process is a biological nutrient removal (BNR) process followed by filtration and ultra violet (UV) light disinfection. The Discharger is proposing construction of the BNR/tertiary-level treatment facilities in four phases. Phase 1A would be a year-round advanced treatment 2.3 mgd discharge expansion to meet the current gap in dry water year disposal capacity and to meet the needs of growth through 2011. Phase 1B would be a 2.5 mgd expansion to satisfy projected growth needs from 2011 to 2016. The 2.3 mgd Phase 1A and 2.5 mgd Phase 1B advanced-level treatment year-round discharge are considered in this Order. The Discharger has planned for future potential requirements that all discharges to the river, including winter discharges, must receive BNR/tertiary-level treatment by 2016. Therefore Phase 2 and Phase 3 would include upgrade of the existing secondary effluent flows to a year-round full tertiary treatment process capable of discharging 20 mgd.

Until then, the Discharger has planned improvements to the current treatment processes. During the months of October, November, and May, the Facility storage ponds often experience increased algal growth, which causes difficulty in meeting the effluent limitations for total suspended solids and total coliform organisms. As a result, the treated water is retained in the Facility storage ponds until it can meet the effluent limitations. To facilitate discharge during these periods, the Discharger is planning to add a dissolved air flotation thickener to remove algae.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in this Order are based on the applicable plans, policies, and regulations identified in section II of the Limitations and Discharge Requirements (Findings). This section provides supplemental information, where appropriate, for the plans, policies, and regulations relevant to the discharge.

A. Legal Authority

See Limitations and Discharge Requirements - Findings, Section II.C.

B. California Environmental Quality Act (CEQA)

See Limitations and Discharge Requirements - Findings, Section II.E.

C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plans**. The Regional Water Board adopted a *Water Quality Control Plan, Fourth Edition (Revised September 2004), for the Sacramento and San Joaquin River Basins* (Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. In addition, State Water Board Resolution No. 88-63 requires that, with certain exceptions, the

Regional Water Board assign the municipal and domestic supply use to water bodies that do not have beneficial uses listed in the Basin Plan. The existing beneficial uses of the SJR, from the mouth of the Merced River to Vernalis, as identified in Table II-1 of the Basin Plan include; agricultural supply (AGR) including both irrigation and stock watering, industrial process supply (PRO), body contact recreation, canoeing and rafting, (REC-1), and other non-body contact recreation (REC-2), warm freshwater aquatic habitat (WARM), migration of aquatic organisms (MIGR) both warm and cold habitats, warm habitat spawning, reproduction, and/or early development (SPWN), and wildlife habitat (WILD). Municipal and domestic supply (MUN) is identified as a potential beneficial use.

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. Section 131.3(e), 40 CFR, defines existing beneficial uses as those uses actually attained after 28 November 1975, whether or not they are included in the water quality standards. Federal Regulation, 40 CFR 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.

This Order contains Effluent Limitations requiring a tertiary level of treatment, or equivalent, which is necessary to protect the beneficial uses of the receiving water. The Regional Water Board has considered the factors listed in CWC section 13241 in establishing these requirements.

2. **Antidegradation Policy.** 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 No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. As discussed in detail in the Fact Sheet (Attachment F,

Section IV.D.4.) the discharge is consistent with the antidegradation provisions of 40 CFR section 131.12 and State Water Board Resolution 68-16.

3. **Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at title 40, Code of Federal Regulations section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed. Compliance with the Anti-Backsliding requirements is discussed in Section IV.D.3.

4. **Emergency Planning and Community Right to Know Act**. Section 13263.6(a), California Water Code, requires that "*the Regional Water Board shall prescribe effluent limitations as part of the waste discharge requirements of a POTW for all substances that the most recent toxic chemical release data reported to the state emergency response commission pursuant to Section 313 of the Emergency Planning and Community Right to Know Act of 1986 (42 U.S.C. Sec. 11023) (EPCRKA) indicate as discharged into the POTW, for which the State Water Board or the Regional Water Board has established numeric water quality objectives, and has determined that the discharge is or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to, an excursion above any numeric water quality objective*".

   The Regional Water Board has adopted numeric receiving water objectives for selenium and molybdenum for the SJR in the Basin Plan. As detailed elsewhere in this Permit, available effluent quality data indicate that effluent concentrations of selenium and molybdenum do have a reasonable potential to cause or contribute to an excursion above the numeric water quality objectives for these constituents included within the Basin Plan. The EPCRKA Section 313 toxic chemical release data report indicates that the selenium and molybdenum are discharged into the Discharger's collection system. Effluent limitations for selenium and molybdenum are included in this permit pursuant to CWC Section 13263.6(a).

5. **Stormwater Requirements.** USEPA promulgated Federal Regulations for storm water on 16 November 1990 in 40 CFR Parts 122, 123, and 124. The NPDES Industrial Storm Water Program regulates the storm water discharges from the City of Modesto. Wastewater treatment plants are applicable industries under the stormwater program and are obligated to comply with the Federal Regulations.

6. **Endangered Species Act.** 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 sections 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. sections 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.

7. **Water Reuse Policy.** The Basin Plan's Water Reuse Policy states, "*The Regional Water Board encourages the reclamation and reuse of wastewater…and requires as part of a Report of Waste Discharge an evaluation of reuse and land disposal options as alternative disposal methods. Reuse options should include consideration of the following, where appropriate, based on the quality of the wastewater and the required quality for the specific reuses: industrial and municipal supply, crop irrigation, landscape irrigation, ground water recharge, and wetland restoration*." The purpose of the Water Reuse Policy is to evaluate alternative methods of disposal to prevent unnecessary discharges to surface water.

   Through an engineering study[1], master planning[2], and the Water Reclamation Feasibility Study[3], the Discharger determined that, based upon existing treatment standards, the secondary treatment facility has sufficient capacity to treat projected flows at build-out. However, there is insufficient capacity to dispose of treated effluent during periods of low river flows. Currently, the Discharger disposes of treated secondary effluent in two ways: by discharging to the river during permitted periods, or through irrigation of 2,526 acres of ranch land. The Discharger currently disposes of approximately 60 percent of the annual flow via irrigation, and the remaining 40 percent is discharged to the river. Since 1999, the Discharger also accepts cannery wastes through a segregated wastewater pipeline, which is applied to directly to the ranch land at agronomic rates during the canning season (July – September). The discharge of cannery and secondary wastewaters to the ranch are regulated by separate waste discharge requirements, Order No. 99-112.

   The volume of secondary-level treated effluent that can be discharged to the river is affected by river flow. In general, less treated effluent can be discharged to the river in dry years, and it is possible that the difference may not be made up through increased irrigation during sustained drought years. The Discharger has evaluated various disposal options including both increased land reclamation area and a more advanced treatment process that would accommodate a year-round surface water discharge (See section E. Planned Changes in this Fact Sheet).

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

1. Under Section 303(d) of the 1972 Clean Water Act, 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 25 July 2003 USEPA gave final approval to California's 2002 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*

[1] Engineer's Report – Justification and Cost Allocation for Proposed Wastewater Collection System and Treatment Plant Improvements. Prepared by Carollo Engineers for the City of Modesto. August 2006.

[2] Wastewater Master Plan Phase 2 Update – Master Plan Report. Prepared by Carollo Engineers for the City of Modesto. March 2007.

[3] Northern San Joaquin Valley Water Reclamation Project. Feasibility Study Report. Prepared by RMC for the City of Modesto. June 2005.

not expected to meet) water quality standards even after the application of appropriate limitations for point sources (40 CFR 130, et seq.)." The Basin Plan also states, "*Additional treatment beyond minimum federal standards will be imposed on dischargers to [WQLSs]. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment.*" Pollutants identified on the California 303(d) List as impairing the SJR include boron, selenium, electrical conductivity, chlorpyrifos, diazinon, DDT, Group A pesticides, and unknown toxicity. With the exception of unknown toxicity, agriculture is identified as the primary source of pollutants on the California 303(d) List impairing the SJR.

2. **Total Maximum Daily Loads.** The USEPA requires the Regional Water Board to develop total maximum daily loads (TMDLs) for each 303(d) listed pollutant and water body combination. The status of each TMDL and applicable effluent limitations are discussed in further detail below for each specific pollutant.

E. Other Plans, Polices and Regulations

1. The discharge authorized herein and the treatment and storage facilities associated with the discharge of treated municipal wastewater, except for discharges of residual sludge and solid waste, are exempt from the requirements of Title 27, California Code of Regulations (CCR), section 20005 *et seq*. (hereafter Title 27). The exemption, pursuant to Title 27 CCR section 20090(a), is based on the following:

   a. The waste consists primarily of domestic sewage and treated effluent;

   b. The waste discharge requirements are consistent with water quality objectives; and

   c. The treatment and storage facilities described herein are associated with a municipal wastewater treatment plant.

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

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

The Federal CWA mandates the implementation of effluent limitations that are as stringent as necessary to meet water quality standards established pursuant to state or federal law [33 U.S.C., § 1311(b)(1)(C); 40 CFR, § 122.44(d)(1)]. NPDES permits must incorporate discharge limits necessary to ensure that water quality standards are met. This requirement applies to narrative criteria as well as to criteria specifying maximum amounts of particular pollutants. Pursuant to Federal Regulations, 40 CFR Section 122.44(d)(1)(i), NPDES permits must contain limits that control all pollutants that "*are or may be discharged at a level which will cause, have the reasonable potential to cause,*

or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality." Federal Regulations, 40 CFR, §122.44(d)(1)(vi), further provide that "[w]*here a state has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority must establish effluent limits.*"

The CWA requires point source discharges to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations: 40 CFR §122.44(a) requires that permits include applicable technology-based limitations and standards, and 40 CFR §122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water where numeric water quality objectives have not been established. The Regional Water Board's Basin Plan, page IV-17.00, contains an implementation policy ("Policy for Application of Water Quality Objectives") that specifies that the Regional Water Board "*will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives*." This Policy complies with 40 CFR §122.44(d)(1). With respect to narrative objectives, the Regional Water Board must establish effluent limitations using one or more of three specified sources, including (1) EPA's published water quality criteria, (2) a proposed state criterion (*i.e*., water quality objective) or an explicit state policy interpreting its narrative water quality criteria (*i.e*., the Regional Water Board's "Policy for Application of Water Quality Objectives")(40 CFR 122.44(d)(1)(vi) (A), (B) or (C)), or (3) an indicator parameter. The Basin Plan contains a narrative objective requiring that: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life*" (narrative toxicity objective). The Basin Plan requires the application of the water quality objective necessary to ensure that surface water and groundwater do not contain chemical constituents, discoloration, toxic substances, radionuclides, or taste and odor producing substances that adversely affect beneficial uses. The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. The Basin Plan also limits chemical constituents in concentrations that adversely affect surface water beneficial uses. For waters designated as municipal, the Basin Plan specifies that, at a minimum, waters shall not contain concentrations of constituents that exceed Maximum Contaminant Levels (MCL) of CCR Title 22. The Basin Plan further states that, to protect all beneficial uses, the Regional Water Board may apply limits more stringent than MCLs.

A. Discharge Prohibitions

1. *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 CFR 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 CFR 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 CFR 122.41(m), as allowing bypass only for essential maintenance to assure efficient operation.

B. Technology-Based Effluent Limitations

1. Scope and Authority

Technology-based treatment requirements under section 301(b) of the CWA represent the minimum level of control that must be imposed in a permit issued under section 402 of the CWA. Regulations promulgated at 40 CFR 122.44 (a) require technology-based effluent limitations to be placed in NPDES permits based on national effluent limitations guidelines and standards, best professional judgment (BPJ), or a combination of the two. 40 CFR Part 133 provides information on the level of effluent quality attainable through the application of secondary or equivalent treatment.

Following publication of the secondary treatment regulations, legislative history indicates that Congress was concerned that USEPA had not "sanctioned" the use of certain biological treatment techniques that were effective in achieving significant reductions in BOD_5 and TSS for secondary treatment. Therefore to prevent unnecessary construction of costly new facilities, Congress included language in the 1981 amendment to the Construction Grants statues [Section 23 of Pub. L. 97-147] that required USEPA to provide allowance for alternative biological treatment technologies such as trickling filters or waste stabilization ponds. In response to this requirement, definition of secondary treatment was modified on 20 September 1984 and 3 June 1985, and published in the revised secondary treatment regulations contained in section 133.105. These regulations allow alternative limitations for facilities using trickling filters and waste stabilization ponds that meet the requirements for "equivalent to secondary treatment." These "equivalent to secondary treatment" limitations are *up to* 45 mg/L (monthly average) and *up to* 65 mg/L (weekly average) for BOD_5 and TSS.

2. Applicable Technology-Based Effluent Limitations

a. **BOD_5 and TSS, Disinfected Secondary-level Treated Discharge.** 40 CFR Part 133.103 and 133.105 describe the minimum level of effluent quality attainable by facilities eligible for treatment equivalent to secondary treatment, including waste stabilization ponds, in terms of the parameters for biochemical oxygen demand (BOD), suspended solids (SS), and pH. The Facility uses stabilization ponds as the means of secondary treatment of influent wastewater. Previous Orders have established effluent limitations for conventional pollutants using primarily these minimum levels of effluent quality established in 40 CFR Part 133.105. These minimum levels of treatment are retained in this Order. In addition to the average weekly and average monthly effluent limitations, a daily maximum effluent

b. **Flow**. The Facility was designed to provide a secondary level of treatment for up to a design flow of 70 mgd. Therefore, this Order contains an Average Daily Discharge Flow limit for the seasonal secondary-level treated effluent of 70 mgd (1 Oct – 31 May). When the Facility's expansion projects, tertiary-level treatment facility Phase 1A and Phase 1B, are complete, this Order allows an additional year round Average Daily Discharge Flow limit for tertiary-level treated effluent of 4.8 mgd.

c. **BOD_5 and TSS, Year-round Tertiary-level Treated Discharge .** Federal Regulations, 40 CFR, Part 133, establish the minimum weekly and monthly average level of effluent quality attainable by secondary treatment for BOD_5 and TSS. For the year-round discharge, tertiary treatment is necessary to protect the beneficial uses of the SJR, and therefore, the final effluent limitations for BOD_5 and TSS are based on the technical capability of the tertiary-level treatment process. BOD_5 is a measure of the amount of oxygen used in the biochemical oxidation of organic matter. The secondary- and tertiary-levels treatment standards for BOD_5 and TSS are indicators of the effectiveness of the treatment processes. The principal design parameter for wastewater treatment plants is the daily BOD_5 and TSS loading rates and the corresponding removal rate of the system. In applying 40 CFR Part 133 for weekly and monthly average BOD_5 and TSS limitations, the application of tertiary-level treatment processes results in the ability to achieve lower levels for BOD_5 and TSS than the secondary standards currently prescribed; the 30-day average BOD_5 and TSS limitations have been revised to 10 mg/L, which is technically based on the capability of a tertiary-level treatment system. In addition to the average weekly and average monthly effluent limitations, a daily maximum effluent limitation for BOD_5 and TSS is included in this Order to ensure that the treatment works are not organically overloaded and operate in accordance with design capabilities (See Tables F-3a and F-3b for final technology-based effluent limitations required by this Order.). In addition, 40 CFR 133.102, in describing the minimum level of effluent quality attainable by secondary-level treatment, states that the 30-day average percent removal shall not be less than 85 percent. If 85 percent removal of BOD_5 and TSS must be achieved by a secondary-level treatment plant, then it must also be achieved by a tertiary-level (i.e., treatment beyond secondary level) treatment plant. Therefore, for the year-round discharge this Order also contains a limitation requiring an average of 85 percent removal of BOD_5 and TSS over each calendar month.

Summary of Technology-based Effluent Limitations

Table F-3a. Summary of Technology-based Effluent Limitations - Seasonal Secondary-level Treated Discharge, Discharge Point 001

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
5-Day BOD @ 20 °C	mg/L	30	45	90	---	---
Total Suspended Solids	mg/L	45	60	105	---	---
Flow	mgd	--	--	70[1]	--	--

[1] Average daily discharge flow

Table F-3b. Summary of Technology-based Effluent Limitations – Year-round Tertiary-level Treated Discharge, Discharge Point 001

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
5-Day BOD @ 20 °C	mg/L	10	15	20	---	---
Total Suspended Solids	mg/L	10	15	20	---	---
Flow	mgd	--	--	4.8[1]	--	--

[1] Average daily discharge flow

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

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

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

a. **Beneficial Uses.** The existing beneficial uses of the SJR, from the mouth of the Merced River to Vernalis, as identified in Table II-1 of the Basin Plan include; agricultural supply (AGR) including both irrigation and stock watering, industrial process supply (PRO), body contact recreation, canoeing and rafting, (REC-1),

and other non-body contact recreation (REC-2), warm freshwater aquatic habitat (WARM), migration of aquatic organisms (MIGR) both warm and cold habitats, warm habitat spawning, reproduction, and/or early development (SPWN), and wildlife habitat (WILD). Municipal and domestic supply (MUN) is identified as a potential beneficial use.

b. **Dilution Credits/Mixing Zone.**

i. **Regulatory Guidance for Dilution Credits and Mixing Zones.** The CWA directs states to adopt water quality standards to protect the quality of its waters. USEPA's current water quality standards regulation authorizes states to adopt general policies, such as mixing zones, to implement state water quality standards (40 CFR section 122.44 and section 122.45). The USEPA allows states to have broad flexibility in designing its mixing zone policies. Primary policy and guidance on determining mixing zone and dilution credits is provided by the USEPA Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001) (TSD), the Basin Plan, and the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California (State Implementation Policy or SIP).

The TSD notes at Section 2.2.2: "*It is not always necessary to meet all water quality criteria within the discharge pipe to protect the integrity of the waterbody as a whole. Sometimes it is appropriate to allow for ambient concentrations above the criteria in small areas near outfalls. These areas are called mixing zones. Since these areas of impact, if disproportionately large, could potentially adversely impact the productivity of the waterbody, and have unanticipated ecological consequences, they should be carefully evaluated and appropriately limited in size. As our understanding of pollutant impacts on ecological systems evolves, there may be cases identified where no mixing zone is appropriate.*"

The Basin Plan, Policy for Application of Water Quality Objectives, which states in part, "*In conjunction with the issuance of NPDES and storm water permits, the Regional Board may designate mixing zones within which water quality objectives will not apply provided the discharger has demonstrated to the satisfaction of the Regional Board that the mixing zone will not adversely impact beneficial uses. If allowed, different mixing zones may be designated for different types of objectives, including, but not limited to, acute aquatic life objectives, chronic aquatic life objectives, human health objectives, and acute and chronic whole effluent toxicity objectives, depending in part on the averaging period over which the objectives apply. In determining the size of such mixing zones, the Regional Board will consider the applicable procedures and guidelines in the EPA's Water Quality Standards Handbook and the [TSD]. Pursuant to EPA guidelines, mixing zones designated for acute aquatic life objectives will generally be limited to a small zone of initial dilution in the immediate vicinity of the discharge.*"

The 1994 USEPA Water Quality Handbook defines the *mixing zone* as *"an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented."* A *mixing zone* is further defined *"as a limited area or volume where initial dilution of a discharge takes place,"* In this document, USEPA recommends that *"water quality standards are met at the edge of the regulatory mixing zone",* and that "*the area or volume of an individual mixing zone or group of zones must be limited to an area or volume as small as practicable that will not interfere with the designated uses or with the established community of aquatic life in the segment for which the uses are designated*." USEPA further contends that the shape "*should be a simple configuration that is easy to locate in the body of water and that avoids impingement on biologically important areas"…and* emphasizes that *"'shore hugging' plumes should be avoided in all water bodies*."

The SIP, Section 1.4.2, states, in part, "…*the Regional Board may grant mixing zones and dilution credits to dischargers in accordance with the provisions of this section... The applicable priority pollutant criteria and objectives are to be met throughout a water body except within any mixing zone granted by the Regional Board. The allowance of mixing zones is discretionary and shall be determined on a discharge-by-discharge basis.*"

The SIP lists conditions that must be met in allowing a mixing zone, and states that the Regional Water Board "*shall deny or significantly limit a mixing zone and dilution credit as necessary to protect beneficial uses, meet the conditions of this Policy, or comply with other regulatory requirements.*"

"The approach to making a mixing zone determination also depends on whether a discharge is completely-mixed or incompletely-mixed with the receiving water.. "

A completely mixed discharge condition is defined by the SIP as: "… *not more than a 5 percent difference, accounting for analytical variability, in the concentration of a pollutant exists across a transect of the water body at a point within two stream/river widths from the discharge point*."

For incompletely mixed discharges, the SIP provides that: "*Dilution credits and mixing zones for incompletely-mixed discharges shall be considered by the RWQCB only after the discharger has completed an independent mixing zone study and demonstrated to the satisfaction of the RWQCB that a dilution credit is appropriate*."

ii. **Monitoring and Field Studies and Resultant Critical/Design Flows.** The CA Department of Water Resources (DWR) operates monitoring stations at various locations along the SJR. Information on real-time and historical SJR flows upstream of the discharge is available from the DWR San Joaquin River Patterson Station (SJP), which is approximately 2 miles upstream from the point of discharge. The mean of daily river flow values recorded upstream at the SJP station from 1 January 2001, to 1 June 2006, was approximately

1,564 cfs (1011 mgd), and the daily flows ranged from 222 cfs (144 mgd) to 27,232 cfs (17,603 mgd) (considering 1,945 observations).

In the vicinity of the discharge, the river is relatively shallow, and the field studies conducted by the Discharger indicated that at 310 cfs the river depth at the point of discharge was routinely less than 2 feet.

In the document, Technical Guidance Manual for Performing Wasteload Allocation, Book IV: Design Conditions, Chapter 1, USEPA discusses and recommends two methods for determining design flows, 1) the hydrologically-based method and 2) the biologically-based method, and the flows that should be used for both the CCC and CMC. For toxic wasteload allocation studies in which the hydrologically-based method is used, USEPA recommends the use of the 1Q10 flow as the design flow for the CMC and the 7Q10 as the design flow for the CCC. The 1Q10 and 7Q10 are both hydrologically-based design flows. The 1Q10 is the lowest 1-day average flow that occurs (on average) once every 10 years. The 7Q10 is the lowest 7-day average flow that occurs (on average) once every 10 years. USEPA recommend the long-term harmonic mean flow of the receiving water be used when considering permitting for human health criteria for carcinogenic pollutants. SJR flows from 1980 through 2006 (9,861 days) were analyzed for critical conditions using the USEPA's DFLOW 3.0 program, resulting in the following design flows:

Design Flow	SJR @ Patterson (cfs)	SJR @ Patterson (mgd)
1Q10	229	148
7Q10	238	154
Harmonic Mean	799	516

However, because discharges to the receiving water are only allowed when the river to effluent ratio flow is at a minimum 20:1, and since the Facility pumps operate at a minimum flow rate of 15.5 cubic feet per second (cfs), the minimum SJR flow rate at which secondary effluent can be discharged calculates to 310 cfs. Thus, it is reasonable to use 310 cfs as the representative 7Q10 critical flow of the river.

iii. **Dilution/Mixing Zone Study Results.** The previous permit required the Discharger to conduct a Dilution/Mixing Zone Study (The Study) to address requirements of the SIP, Section 1.4.2. In response, the Discharger collected data for The Study between December 2001 and March 2003, to evaluate the extent of the effluent-influenced river volume and mixing conditions at the point the effluent flows into the river. Since background electrical conductivity (EC) levels in the river are generally 50% greater than the effluent, the Discharger collected EC measurements at a series of transects across the river, at each incremental longitudinal location along the river, to locate and identify the plume. In addition, on 17 April 2003, the Discharger performed stage measurements with a laser level beacon, which indicated that the SJR is approximately 62 meters wide at the point where the Facility discharge enters the river. Field measurements recorded during The Study indicate EC

levels vary by greater than 5% at the 125 meter transect, and therefore, the discharge is not completely mixed in the receiving water as defined by the SIP.

In accordance with Section 4.4 of the TSD, "*If completely mixed conditions do not occur within a short distance of the outfall, the…study should rely on mixing zone monitoring and modeling.*", the Discharger used field measurements and monitoring results, and the CORMIX (Cornell Mixing Zone Expert System) software system to evaluate the mixing conditions.

The Regional Water Board has considered The Study and subsequent modeling predictions and finds that the Discharger has not satisfactorily demonstrated that a mixing zone allowance for acute and chronic aquatic life criteria will not adversely impact ecological systems or comply with other regulatory requirements. The following factors, in part, summarize the Regional Water Board's findings.

1) **Tributary Channel:** A mixing zone can be thought of as a limited area or volume where the initial dilution of a discharge occurs; and therefore, mixing zone allowances adversely impact immobile species, such as benthic communities, in the immediate vicinity of the outfall. The discharge outfall is located in an earthen vegetated tributary channel that carries effluent discharge flows approximately 100 feet to the SJR. USEPA recommends that it be determined whether the assimilative capacity of the receiving system can safely accommodate the discharge, and that the assessment should consider the life history and behavior of organisms in the receiving system before defining the mixing zone. USEPA further states that mixing zones should not be permitted where they may endanger critical areas such as breeding grounds or areas with sensitive biota, and recommends a multi-step data collection and analysis and identification of all water bodies and the ecological data pertaining to them, the assessment of the relative environmental value, and level of protection needed. The Study does not assess impacts from the discharge to the tributary channel, a water of the State that must be considered.

   Moreover, the Discharger's model's input variable for the tributary channel were determined "by evaluating the river morphometry measurements and comparing model run outputs with measured mixing data. The effective discharge [tributary] channel width was determined by matching predicted downstream plume width to measured field data. (p.26, The Study) " This model's inputs for the tributary channel width and depth were 2.5 feet and 0.81 feet respectively. The Regional Water Board believes that quantifying accurately the physical system being modeled is important in the modeling process; otherwise, the model may produce erroneous results. Upon a site-inspection, Regional Water Board staff observed the tributary channel to be at least 8 feet wide at the point of discharge, which leads to conclude that the model may yield unrealistic results.

2) **Initial Conditions:** The Regional Water Board recognizes that for river systems, specifying realistic initial water flow and water quality variables in the model domain may not be feasible or possible, and that this case presents additional challenges because the effluent is discharged into a tributary channel at an angle (approximately 90 degrees), and then the tributary channel directs the effluent flows into the river system at another angle (approximately 45 degree). Because CORMIX, the Discharger's selected modeling system, requires that the actual cross section of the ambient water body be described by an equivalent rectangular channel, the initial conditions, that is the near-field region where the initial jet momentum, buoyancy flux, and outfall characteristics control the mixing process, is represented in this model at the point the tributary flow mixes with the river (referred to as the cumulative discharge), not at the effluent discharge point. Thus, the model predicts a jet momentum 100 feet from the point of discharge into the river, which may also be unrealistic results.

   The Regional Water Board believes that additional monitoring data and field studies are required to provide initial conditions, and adequately characterize this complex system. The Study did not include the tributary channel flow data to determine if the initial condition was realistically represented in modeling, and only seven of the sampling events collected data one meter from where the tributary channel converges with the river. Furthermore, the location of the transect samples in these seven sampling events are unclear. As recorded in The Study's spreadsheets (Appendix A), samples were either taken starting 14-15 feet from shore, or starting at the shoreline, and if the sampling results were obtained at the shoreline, then the results indicate that the plume is hugging the river shoreline and therefore a mixing zone is not allowed (see previous section, Regulatory Guidance for Dilution Credits and Mixing Zones). Conversely, if the monitoring locations started approximately 15 feet from the shoreline, then additional monitoring is need to determine if the plume hugs the shoreline.

3) **Calibration and Validation:** Calibration is the process of selecting model parameters to "fit" the model to the system and validation is testing those parameters on an independent data set. The previous discussions in this Fact Sheet conveyed concerns regarding the calibration of the model resulting in unrealistic predictions. CORMIX disclaimer states "The user must take note that HYDRODYNAMIC MODELING by any known technique is NOT AN EXACT SCIENCE. Extensive comparison with field and laboratory data has shown that the CORMIX predictions on dilutions and concentrations (with associated plume geometries) are reliable for the majority of cases and are accurate to within about +-50%." The Study attempts to fit a complex effluent/river system into a steady-state simplified modeling system, in this case CORMIX. For any modeling system, performance is usually examined by comparing simulated results with field observations, as well as analyzing the difference between simulated

results and field observations. In the Results and Discussion section of The Study it states "It is interesting that the minimum dilution of the side channel effluent with the ambient river flow occurs under relatively high ambient flow rates." Yet The Study does not provide an analysis as to why this prediction may be realistic, nor validate the modeling predictions with field observations. For a mixing zone to be allowed, the Discharger should adequately demonstrate that all requirements for a mixing zone are met; however, The Study does not include any modeling validation such as additional field sampling and dye studies to prove that the model did not over predict the dilution.

Therefore, a mixing zone for acute and chronic aquatic life criteria is not allowed because The Study's recommendations may not protect the aquatic life beneficial uses and meet the conditions of the SIP, as required by Section 1.4.2 for incompletely mixed discharges.

iv. **Evaluation of Available Dilution for Acute and Chronic Aquatic Life Criteria.** For the acute and chronic aquatic life criteria, the discharge is considered to be incompletely mixed. For incompletely mixed discharges, the SIP provides that: "*Dilution credits and mixing zones for incompletely-mixed discharges shall be considered by the RWQCB only after the discharger has completed an independent mixing zone study and demonstrated to the satisfaction of the RWQCB that a dilution credit is appropriate*." As discussed above, due to deficiencies in the Discharger's dilution/mixing zone study, the Discharger has not adequately demonstrated that dilution credits for the acute and chronic aquatic life criteria are appropriate. Therefore, this Order does not allow any dilution credits in the calculation of the water quality-based effluent limitations based on acute and chronic aquatic life criteria. The Discharger must meet end-or-pipe effluent limitations for these criteria.

v. **Evaluation of Available Dilution for Priority Pollutant Human Health Criteria.** Section 1.4.2.2 of the SIP, provides that mixing zones should not be allowed at or near drinking water intakes. Furthermore, regarding the application of a mixing zone for protection of human health, the TSD states that," …*the presence of mixing zones should not result in significant health risks, when evaluated using reasonable assumptions about exposure pathways. Thus, where drinking water contaminants are a concern, mixing zones should not encroach on drinking water intakes.*". There are no known drinking water intakes in the vicinity of the discharge.

For constituents where water quality criteria are based on human health objectives, critical environmental impacts are expected to occur far downstream from the source such that complete mixing is a valid assumption. With regard to completely mixed discharges the SIP states, "*For completely-mixed discharges…the amount of receiving water available to dilute the effluent shall be determined by calculating the dilution ratio (i.e. the critical receiving water flow divided by the effluent flow)…*" Therefore, for purposes

of establishing WQBELs in this Order, dilution credits may be granted based on the critical flows of the receiving water and effluent discharge.

a) **Seasonal disinfected secondary discharge (70 mgd).** For human health criteria the SIP recommends using the harmonic mean receiving water flow and the long-term arithmetic mean to calculate a dilution credit (SIP at Section 1.4.2.1). Based on the SJR harmonic flow of 516 mgd (see b.ii. Critical/design flows in this section for further details) and a long-term arithmetic mean disinfected secondary discharge of 25.5 mgd (2005-2007), a dilution credit of up to 20.2:1 may be allowed for the seasonal disinfected secondary discharge. The long-term dilution for the season disinfected secondary discharge is 20:1, because this Order only allows the discharge of disinfected secondary-level treated effluent from October 1 through May 31 and when river flows provide a minimum flow ratio of 20:1 (receiving water to effluent). Therefore, this Order grants a 20:1 dilution credit applicable to the human health criteria for the seasonal disinfected secondary discharge.

b) **Year-round Tertiary-level treated discharge (4.8 mgd).** Using the permitted flow of 4.8 mgd for the year-round tertiary discharge, a dilution credit of up to 107:1 may be allowed for the year-round tertiary discharge.

vi. **Evaluation of Available Dilution for Agricultural Water Quality Objectives.** For constituents where water quality criteria are based on agricultural water quality objectives, critical environmental impacts are expected to occur far downstream from the source such that complete mixing is a valid assumption. With regard to completely mixed discharges the SIP states, "*For completely-mixed discharges…the amount of receiving water available to dilute the effluent shall be determined by calculating the dilution ratio (i.e. the critical receiving water flow divided by the effluent flow)…*" Therefore, for purposes of establishing WQBELs in this Order, dilution credits may be granted based on the critical flows of the receiving water and effluent discharge.

a) **Seasonal disinfected secondary discharge (70 mgd).** This Order only allows the discharge of disinfected secondary-level treated effluent from October 1 through May 31 and when river flows provide a minimum flow ratio of 20:1 (receiving water to effluent). Therefore, the minimum long-term dilution is 20:1. Consequently, this Order grants a 20:1 dilution credit applicable to the water quality objectives protective of the agricultural supply beneficial use for the seasonal disinfected secondary discharge.

b) **Year-round Tertiary-level treated discharge (4.8 mgd).** For the year-round tertiary discharge, a conservative approach for developing dilution credits for water quality objectives protective of the agricultural supply beneficial use is to use the 1Q10 flow and the maximum permitted effluent flow. Based on the 1Q10 SJR flow of 148 mgd (see b.ii. Critical/design flows in this section for further details) and the permitted year-round

discharge flow of 4.8 mgd, a dilution credit of up to 30.8:1 may be allowed for the year-round tertiary discharge.

c. **Hardness**. While no effluent limitation for hardness is necessary in this Order, hardness is critical to the assessment of the need for, and the development of, Water Quality Based Effluent Limitations for certain metals. As described in the CTR, freshwater aquatic life criteria for certain trace metals are expressed as a function of hardness, since hardness, and/or water quality characteristics that are usually correlated with hardness, can reduce or increase the toxicities of some metals. Hardness is used as a surrogate for a number of water quality characteristics which affect the toxicity of metals in a variety of ways. The California Toxics Rule, at (c)(4), states the following:

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

The *California Toxics Rule* and the *National Toxics Rule* 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 hardness-dependent metals include cadmium, copper, chromium III, lead, nickel, silver, and zinc. The equation describing the total recoverable regulatory criterion is as follows:

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

Where:

WER = water-effect ratio (default of 1.0 used in this Order)

m = criterion-specific constant

H = Hardness

b = criterion-specific constant

The constants "m" and "b" are specific to both the metal under consideration, and the type of total recoverable criterion (i.e. acute or chronic).

Effluent limitations for the discharge must be set to protect the beneficial uses of the receiving water for all discharge conditions. In the absence of the option of including condition-dependent, "floating" effluent limitations that are reflective of actual conditions at the time of discharge, effluent limitations must be set using a reasonable worst-case condition in order to protect beneficial uses for all discharge conditions. Recent studies indicate that using the receiving water lowest hardness for establishing water quality criteria is not the most protective for the receiving water. The Regional Water Board has evaluated these studies and concurs that for some parameters the beneficial uses of the receiving water are best protected using the lowest hardness value of the effluent, while for some

parameters, the use of both the lowest hardness value of the receiving water and the lowest hardness value of the effluent is the most protective, provided sufficient hardness data for the effluent and receiving water are available.

Because of the non-linearity of the Total Recoverable CTR Criterion equation, the relationship can be either concave downward or concave upward depending on the criterion-specific constants. For those contaminants whereby the regulatory criteria exhibit a concave downward relationship as a function of hardness (e.g. acute and chronic copper, chromium III, nickel, and zinc, and chronic cadmium), use of the lowest recorded effluent hardness for establishment of water quality objectives is fully protective of all beneficial uses regardless of whether the effluent or receiving water hardness is higher.

For those metals where the regulatory criteria exhibit a concave upward relationship as a function of hardness (i.e. acute cadmium, acute and chronic lead, and acute silver), a water quality objective based on either the effluent hardness or the receiving water hardness would not be protective under all mixing scenarios. Rather, a water quality objective that accounts for both the hardness of the receiving water and the effluent is required. The following equations provide fully protective water quality criteria for these metals that exhibit a concave upward relationship.

$$\text{Total Recoverable CTR Criterion} = \left(\frac{m\left(H_e - H_{rw}\right)\left(e^{m\{\ln(H_{rw})\}+b}\right)}{H_{rw}} \right) + e^{m\{\ln(H_{rw})\}+b} \quad \text{(Equation 2)}$$

Where:

H_e = Lowest recorded effluent hardness

H_{rw} = Highest, or lowest, recorded receiving water hardness, whichever leads to the development of more restrictive water quality criteria.

m = criterion-specific constant

b = criterion-specific constant.

Effluent limitations for the discharge must be set to protect the beneficial uses of the receiving water for all discharge conditions. For purposes of establishing water quality criteria for hardness-dependent metal criteria with a concave downward relationship (i.e. acute and chronic copper, chromium III, nickel, and zinc, and chronic cadmium), Equation 1, above, was used with a lowest reported effluent hardness value of 130 mg/L as $CaCO_3$ (March 2003), based on 67 samples from December 2001 through November 2006. For establishing water quality criteria for hardness-dependent metal criteria with a concave upward relationship (i.e. acute cadmium, acute and chronic lead, and acute silver), Equation 2, above, was used with either lowest reported effluent hardness and a maximum allowable receiving water hardness of 400 mg/L as $CaCO_3$, or the minimum recorded receiving water hardness value of 88 mg/L as $CaCO_3$.

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3. Determining the Need for WQBELs

a. CWA section 301 (b)(1) requires NPDES permits to include effluent limitations that achieve technology-based standards and any more stringent limitations necessary to meet water quality standards. Water quality standards include Regional Water Board Basin Plan beneficial uses and narrative and numeric water quality objectives, State Water Board-adopted standards, and federal standards, including the CTR and NTR. The Basin Plan includes numeric site-specific water quality objectives and narrative objectives for toxicity, chemical constituents, 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.) With regards to the narrative chemical constituents objective, the Basin Plan 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 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.*"

b. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs, the Regional Water Board finds that the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for aluminum, ammonia, chloride, carbon tetrachloride, chlorodibromomethane, dichlorobromomethane, electrical conductivity, iron, manganese, mercury, molybdenum, nitrate, nitrite, selenium, turbidity and pathogens. Effluent limitations for these constituents are included in this Order. A detailed discussion of each constituent is provided below.

c. The Regional Water Board conducted the RPA in accordance with Section 1.3 of the SIP. Although the SIP applies directly to the control of CTR priority pollutants, the State Water Board has held that the Regional Water Board may use the SIP as guidance for water quality-based toxics control.[4] The SIP states in its introduction "*The goal of this Policy is to establish a standardized approach for permitting discharges of toxic pollutants to non-ocean surface waters in a manner that promotes statewide consistency."* Therefore, in this Order the RPA procedures from the SIP were used to evaluate reasonable potential for both CTR and non-CTR constituents.

[4] See, Order WQO 2001-16 (Napa) and Order WQO 2004-0013 (Yuba City)

d. Water quality-based effluent limitations were calculated in accordance with section 1.4 of the SIP. , as described in Section IV.C.4. of this Fact Sheet.

e. **Aluminum.** The Secondary MCL for aluminum for the protection of the MUN beneficial use is 200 µg/L. In addition, USEPA developed National Recommended Ambient Water Quality Criteria (NAWQC) for protection of freshwater aquatic life for aluminum. The recommended four-day average (chronic) and one-hour average (acute) criteria for aluminum are 87 µg/L and 750 µg/L, respectively. The MEC for aluminum (total) was 210 µg/L, based on 40 samples collected between December 2001 and April 2005, while the maximum observed upstream receiving water aluminum concentration was 2,900 µg/L, based on 30 samples collected between May 2003 and August 2005. Therefore, aluminum in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a level necessary to protect aquatic life and MUN beneficial uses.

Information contained in the footnotes to the NAWQC indicate that the development of the chronic criterion was based on specific receiving water conditions where there is low pH (below 6.5) and low hardness levels (below 50 mg/L as CaCO3). SJR monitoring data obtained from October 2000 through October 2005, exhibited hardness at a minimum value of 50 mg/L as $CaCO_3$, a maximum value of 700 mg/L as $CaCO_3$, and a mean value of 272 mg/L as $CaCO_3$. Because the hardness values in the SJR are higher (which decreases the toxic effects to aquatic life) than the water hardness values in which the criterion was developed, USEPA advises that a water effects ratio might be appropriate to better reflect the actual toxicity of aluminum to aquatic organisms.

In April 2005, the Discharger completed a Phase I Water-Effects Ratio Study (WER) for aluminum, and on 11 November 2005, submitted the results in its *Aluminum Water-Effect Ratio Study Plan*. The Phase 1 WER study consisted of range-finding toxicity tests, in which the species *Daphnia magna, Ceriodaphnia dubia, and Rainbow Trout* were evaluated. In addition, on 12 April 2007, the City of Manteca completed a Phase II aluminum WER study for the SJR near its discharge point, which is downstream of the City of Modesto. The Modesto Phase I WER study is not adequate to calculate a WER, but results suggested that a WER greater than 1.0 may be appropriate. The Manteca Phase II WER study, which may be used to calculate a WER for the City of Manteca's discharge, indicated that a WER of 22.7 can be applied to the chronic criterion for aluminum. Since the characteristics of the river (e.g. hardness and pH) near Manteca are similar to those near Modesto, the results of the Manteca WER study put into question the applicability of the stringent CCC recommended by the NAWQC for aluminum.

Additionally, in May 2006, the Arid West Water Quality Research Project produced a research report, *Evaluation of the EPA Recalculation Procedure in the Arid West Technical Report*, to update NAWQC based on more recent data, and to recalculate those NAWQC to reflect the resident species observed in arid West receiving waters. This research report states that "*speciation and/or*

complexation of aluminum is highly dependent on ambient water quality characteristics and ultimately determines the mechanism of toxicity. [Increased] Concentrations of calcium in the water was shown to decrease toxic effects to fish." Based on the Arid West Technical Report, the Chronic Aluminum (total) Criterion Value is calculated as 1954 µg/L for a mean hardness value of 272 mg/L as $CaCO_3$, which is similar to the value calculated in Manteca's Phase II WER Study. However, this report has not been approved by the EPA nor has it received independent scientific peer review. Therefore, it is not appropriate to use this report at this time.

Based on the above information, using the chronic criterion recommended in the NAWQC (87 µg/L), is not appropriate for the receiving water. Therefore, this Order contains final Average Monthly Effluent Limitations (AMEL) and Maximum Daily Effluent Limitations (MDEL) for aluminum of 373 µg/L and 750 µg/L, respectively, based on the acute criterion recommended in USEPA's NAWQC for the protection of freshwater aquatic life (See Attachment F, Table F-9 for WQBEL calculations). This Order also includes an annual average effluent limitation of 200 µg/L, based on the Secondary MCL, for protection of the MUN beneficial uses.

f. **Ammonia.** Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrite and nitrite to nitrate. Denitrification is a process that converts nitrate to nitrite or nitric oxide and then to nitrous oxide or nitrogen gas, which is then released to the atmosphere. The Discharger does not currently utilize a controlled nitrification process to remove ammonia from the waste stream. Inadequate or incomplete nitrification may result in the discharge of elevated levels of ammonia to the receiving water. Ammonia can be toxic to aquatic organisms in surface waters. Discharges of ammonia would violate the Basin Plan narrative toxicity objective. Applying 40 CFR section 122.44(d)(1)(vi)(B), it is appropriate to use USEPA's Ambient National Water Quality Criteria for the Protection of Freshwater Aquatic Life for ammonia, which was developed to be protective of aquatic organisms.

USEPA's *Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life*, for total ammonia, recommends acute (1-hour average; criteria maximum concentration) standards based on pH, and chronic (30-day average, criteria continuous concentration) standards based on pH and temperature. It also recommends a maximum four-day average concentration of 2.5 times the criteria continuous concentration. USEPA found that as pH increased, both the acute and chronic toxicity of ammonia increased. Salmonids were more sensitive to acute toxicity effects than other species. However, while the acute toxicity of ammonia was not influenced by temperature, it was found that invertebrates and young fish experienced increasing chronic toxicity effects with increasing temperature. The beneficial uses of the SJR, from the mouth of the Merced River to Vernalis, include WARM freshwater habitat, and WARM freshwater spawning. The early life stages of fish are likely present during the permitted period of discharge, and anadromous King (Chinook) salmon occasionally run in reaches

of the SJR during wet years, therefore the recommended criteria for waters where salmonids and early life stages are present were used. USEPA's recommended criteria are shown below:

$$CCC_{30-day} = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right) \times MIN\left(2.85, 1.45 \cdot 10^{0.028(25-T)}\right), \text{ and}$$

$$CMC = \left(\frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}} \right),$$

where *T* is in degrees Celsius

An acute ammonia toxicity criterion was calculated using the maximum permitted effluent pH value of 8.5 pH units and the CMC equation based on salmonids present. The resulting CMC for ammonia is 2.14 mg/L.

The chronic criteria were calculated using the CCC equation based on early life stages present. USEPA recommends that "if samples are obtained from a receiving water over a period of time during which pH and/or temperature is not constant, the pH, temperature, and the concentration of total ammonia in each sample should be determined." (p.85, 1999 Update of Ambient Water Quality Criteria for Ammonia, December 1999, EPA/822/R-99-014). From February 2000 through December 2007 (considering 225 sampling events), the maximum observed pH value in the SJR upstream of the discharge was reported as 8.7 pH units and the average of the pH values was 7.7 pH units. The highest average monthly water temperature obtained in the SJR upstream of the discharge during this same period was 21.4°C, and the minimum value was 8.5°C. Since both the pH and temperature varied during this period, the chronic criterion was calculated using a 30-day average of the pH and of the temperature in the CCC equation for each sample pH and temperature pair, as recommended by USEPA. To be protective of freshwater aquatic life, USEPA further recommends that total ammonia nitrogen concentrations should not exceed this 30-day CCC more than once every three years on the average, and that the highest 4-day average within the 30-day period should not exceed 2.5 times the CCC. Based on this guidance, the 1/10th percentile of all the calculated pairs was determined as the 30-day average CCC at 1.8 mg/L, and the highest 4-day average CCC is calculated at 4.5 mg/L.

In order to develop the acute and chronic long-term averages (LTAs) and effluent limitations using the procedures in the TSD, the coefficient of variation must be calculated. Five years of effluent monitoring data (2003 – 2007) were used to estimate the CV in order to increase the statistical power of the method of calculation. Based on 537 samples, the average concentration of ammonia is 6.47 mg/L, and the standard deviation is 5.55 mg/L. Thus the CV is 0.86, and the LTA_{acute}, $LTA_{chronic4\text{-}day}$, and $LTA_{chronic30\text{-}day}$ are 0.50, 1.26, and 1.87 mg/L, respectively.

Results of daily effluent monitoring during periods of discharge from January 2003 through December 2007 indicate the MEC of ammonia was 24 mg/L (April 2004). Therefore, the discharge has the reasonable potential to exceed the acute water quality ammonia criterion for the protection of fresh water aquatic life at the point of discharge to the SJR. The concentrations of ammonia observed in the SJR ranged from less than 0.02 mg/L to 2.7 mg/L (as N), and the average ammonia concentration was 0.2 mg/L (as N). Based on this information, the SJR does not have assimilative capacity for ammonia, and therefore, a dilution credit is not granted.

The previous Order contained a daily maximum effluent limitation for ammonia calculated using the recorded pH value obtained at the time of the effluent discharge and based upon USEPA's ambient water quality acute toxicity criterion with salmonids present. Instead of this final "floating" ammonia limitation, this Order contains final Average Monthly Effluent Limitations (AMEL) and Maximum Daily Effluent Limitations (MDEL) for ammonia of 0.9 mg/L and 2.1 mg/L, respectively, based on the maximum allowable pH effluent discharge value of 8.5 pH units and the acute LTA (See Table F-4 in this Fact Sheet for WQBEL calculations).

Based on the effluent sample analytical results, it appears that the Discharger may be in immediate non-compliance upon issuance of the permit. 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. The Basin Plan for the Sacramento and San Joaquin River Basins includes a provision that authorizes the use of compliance schedules in NPDES permits for water quality objectives adopted after 25 September 1995 (See Basin Plan at page IV-16). The water quality-based effluent limitations for ammonia are based on a new interpretation of the narrative standard for protection of receiving water beneficial uses. Therefore, a compliance schedule for compliance with the ammonia effluent limitations is established in the Order.

An interim performance-based maximum daily limitation of 24 mg/L was calculated using the statistical methods for calculating interim effluent limitations described in Attachment F, Section IV.E.3. However, this performance-based effluent limitation is less stringent than the final "floating" maximum daily effluent limitation for ammonia from the previous Order. Therefore, the "floating" ammonia effluent limitation was established as the interim limitation in this Order, as described in Attachment F, Section IV.E.3., and is in effect until **1 February 2016.** As part of the compliance schedule, this Order requires the Discharger to submit a corrective action plan and implementation schedule to assure compliance with the final ammonia effluent limitations. In addition, the Discharger shall submit an engineering treatment feasibility study.

g. **Dissolved Oxygen.** On 27 January 2005, the Regional Water Board adopted *Resolution No. R5-2005-0005 Amending the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control Program for*

Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel.

Resolution No. R5-2005-0005 added a new paragraph item #7 to page IV-26 of the Basin Plan which states in part: "*Any increase in the discharge of oxygen demanding substances or their precursors into waters tributary to the DWSC portion of the San Joaquin River is prohibited after 28 January 2005. These prohibitions do not apply if the discharge is regulated by … individual or general waste discharge requirements or NPDES permits, which implement the Control Program…*

"The Regional Water Board establishes the following waste load allocations:

a) The waste load allocations of oxygen demanding substances and their pre-cursors for all NPDES-permitted discharges are initially set at the corresponding effluent limitations applicable on 28 January 2005.

b) Waste load allocations and permit conditions for new or expanded point source discharges in the SJR Basin upstream of the DWSC, including NPDES and stormwater, will be based upon the discharger demonstrating that the discharge will have no reasonable potential to cause or contribute to a negative impact on the dissolved oxygen impairment in the DWSC."

In accordance with the previous permit (Order No. 5-01-120) requirement to evaluate the impacts of the discharge on the dissolved oxygen levels of the lower SJR and the Delta, the Discharger submitted the final May 2004 report, *San Joaquin River Dissolved Oxygen Study*, to the Regional Water Board. In addition to the required effluent and receiving water monitoring, the Discharger monitored dissolved oxygen levels in the SJR upstream at Patterson, and downstream at Laird Park, the Maze Road Bridge, and at the Durham Ferry Bridge weekly during periods of discharge. To assess the dissolved oxygen levels of the lower SJR and the Delta, the Discharger used Qual2E model, which was calibrated and its results validated. The study results indicate that the effluent discharge has negligible impacts on the dissolved oxygen levels in the lower SJR and the Delta.

Additionally, the Discharger conducted and submitted an antidegradation analysis, *June 2007 Antidegradation Analysis for Proposed Wastewater Quality Control Facility Discharge Modification*, for purposes of this permit. The Antidegradation Analysis far-field water quality impact assessments also shows that the discharge to the SJR will have very negligible impacts on the water quality of the SJR and the Delta. The analysis specifically assessed the dissolved oxygen concentrations in the SJR and the Stockton Deep-water Ship Channel, and the subsequent modeling results show that the BOD and nutrient loading from the effluent discharge does not pose significant risk to the attainment of the dissolved oxygen water quality objectives in DWSC.

Consistent with Resolution No. R5-2005-0005, this Order retains the BOD and TSS limits from the previous permit, and contains more stringent effluent

limitations for ammonia that will result in an overall reduction in oxygen demand. This Order does allow an increase discharge of high quality tertiary flow; however, modeling results show that during critical dissolved oxygen periods in the DWSC, this flow would act to further reduce detention times and likely promote an increase in dissolved oxygen concentrations in the DWSC. This Order also retains the surface water receiving water limitation that the discharge shall not cause the dissolved oxygen of the SJR to fall below 7.0 mg/l, in support of the SPWN beneficial use and associated Basin Plan objective (see Section V.A.1.e. of this Fact Sheet).

h. **Boron. (see Subsection z. Salinity)**

i. **Carbon Tetrachloride.** The CTR includes a carbon tetrachloride criterion of 0.25 µg/L for the protection of human health and is based on a one-in-a-million cancer risk for waters from which both water and organisms are consumed. The MEC for carbon tetrachloride was 2.2 µg/L, based on 21 samples collected between December 2001, and April 2005; therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criterion for carbon tetrachloride.

No carbon tetrachloride has been detected in the ambient receiving water, based on 38 samples collected between January 2002, and March 2007. Section 1.4.3.2 of the SIP states that the arithmetic mean shall be calculated using the reported detection limits for samples that are reported below detection limits. The minimum method detection level for the receiving water carbon tetrachloride samples was 0.04 µg/L, and therefore, the arithmetic mean concentration is 0.04 µg/L. An AMEL and MDEL for carbon tetrachloride of 4.5 µg/L and 8.9 µg/L, respectively, are included in this Order for the Seasonal Discharge based on the CTR criterion for the protection of human health (See Attachment F, Table F-8 for WQBEL calculations). Since carbon tetrachloride has not been measured in the influent and is known to be formed during the chlorination process, it is not necessary to include a final effluent limitation for carbon tetrachloride for the year-round tertiary discharge, due to the use of UV disinfection.

j. **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. The recommended agricultural water quality goal for chloride that would apply the narrative chemical constituent objective is 106 mg/L as a long-term average based on Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985). The 106 mg/L water quality goal is intended to protect against adverse effects on sensitive crops when irrigated via sprinklers.

USEPA developed National Recommended Ambient Water Quality Criteria for protection of freshwater aquatic life for chloride. The recommended four-day average (chronic) and one-hour average (acute) criteria for chloride are 230 mg/L and 860 mg/L, respectively. USEPA recommends that the ambient criteria are protective of the aquatic beneficial uses of receiving waters in lieu of site-specific criteria.

Chloride concentrations in the effluent ranged from 110 mg/L to 210 mg/L, with an average of 155 mg/L, for 15 samples collected by the Discharger from January 2002 through January 2003. Background concentrations in SJR ranged from 100 mg/L to 270 mg/L, with an average of 195 mg/L, for 13 samples collected by the Discharger during this same period. Both the receiving water and the effluent exceed the agricultural water quality goal of 106 mg/L, and the receiving water exceeds the USEPA National Recommended Ambient Water Quality Criteria for protection of freshwater aquatic life for chloride of 230 mg/L. Therefore, chloride in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a level necessary to protect aquatic life resulting in a violation of the Basin Plan's narrative toxicity objective. This Order contains final Average Monthly Effluent Limitations (AMEL) and Maximum Daily Effluent Limitations (MDEL) for chloride of 216 mg/L and 282 mg/L, respectively, based on USEPA's National Ambient Water Quality Criteria for the protection of freshwater aquatic life (See Attachment F, Table F-5 for WQBEL calculations). The Discharger can immediately comply with these effluent limitations for chloride.

k. **Chlorine Residual.** For the seasonal discharge of secondary-level treated effluent, the Discharger uses chlorine for disinfection, and subsequently, a sulfur dioxide process to dechlorinate the effluent prior to discharge to the SJR. Due to the existing chlorine use and the potential for chlorine to be discharged, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative toxicity objective.

   The TSD contains statistical methods for converting chronic (four-day) and acute (one-hour) aquatic life criteria to average monthly and maximum daily effluent limitations based on the variability of the existing data and the expected frequency of monitoring. However, because chlorine is an acutely toxic constituent that can and will be monitored continuously, an average one-hour limitation is considered more appropriate than an average daily limitation. Average one-hour and four-day limitations for chlorine, based on these criteria, are included in this Order. These limitations are applied at the point of discharge to the SJR. The Discharger can immediately comply with these effluent limitations for chlorine residual.

   For the year-round discharge, the tertiary treated effluent will be disinfected using UV disinfection, not chlorination, and any maintenance activity waters will be sent to the recirculation channel for process. Based on this information, the tertiary-level treated effluent does not have reasonable potential to discharge chlorine to SJR. Therefore, this Order does not contain chlorine effluent limitations for the year-round tertiary-level treated effluent discharge.

l. **Copper.** The CTR includes hardness-dependent criteria for the protection of freshwater aquatic life for copper. These criteria for copper are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. The SIP, section 1.4.1, allows

the discharger to complete a defensible site-specific translator study, and propose a dissolved to total recoverable translator. The Discharger conducted a copper translator study, and submitted the final results and recommendations to the Regional Water Board on May 2003, "City of Modesto Mixing Zone – Dilution & Copper Translator Study." The study report was updated in June 2007 to consider twenty sampling events. Based on EPA and SIP guidance, that report recommends a chronic translator of 0.5 and an acute translator of 0.70.

The copper water quality objective/criteria most protective under all mixing scenarios should account for the hardness of the effluent, and therefore, the conversion factor for copper in freshwater that provides fully protective water quality criteria is $e^{m[\ln(H)]+b}$, where m = 0.9422 and b = -1.7 for acute, or m = 0.8545 and b = -1.702 for chronic. Using the worst-case measured hardness from the effluent (128 mg/L), the applicable chronic criterion (maximum four-day average concentration) is 11 µg/L, as total recoverable, and the applicable acute criterion (maximum one-hour average concentration) is 18 µg/L, as total recoverable.

The MEC for copper (total) was 11 µg/L, based on 63 samples collected between December 2001 and April 2005, while the maximum observed upstream receiving water copper concentration was also 11 µg/L, based on 34 samples collected between December 2001 and August 2005. Previous Order No. 5-01-120 established final average monthly and maximum daily effluent limitations for total copper effective 1 April 2006; however, because copper effluent and receiving water maximum detected values do not exceed the most stringent water quality criterion as total recoverable, this Order does not contain effluent limitations. This removal of the copper effluent limitation is consistent with the anti-backsliding requirements of the CWA and Federal regulations.

m. **Chlorodibromomethane.** The CTR includes a chlorodibromomethane criterion of 0.41 µg/L for the protection of human health and is based on a one-in-a-million cancer risk for waters from which both water and organisms are consumed. The MEC for chlorodibromomethane was 16 µg/L, and the mean average concentration was 1.98 µg/L, based on 63 samples collected between December 2001 and April 2005. Chlorodibromomethane was not detected in the upstream receiving water, and the lowest reported detection level for chlorodibromomethane was <0.18 µg/L, and therefore, the arithmetic mean concentration was calculated as 0.18 µg/L based on 26 samples collected between February 2002 and August 2005 (Calculated in accordance with the SIP section 1.4.3.2). Therefore, the seasonal disinfected secondary discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criterion for chlorodibromomethane. However, since chlorodibromomethane is a disinfection byproduct caused by the use of chlorine, and the year-round tertiary treated effluent will be disinfected using UV disinfection, not chlorination, the year-round tertiary treated effluent is not expected to contain chlorodibromomethane. Therefore, there is no reasonable potential for the year-round tertiary treated effluent to cause or contribute to an in-stream excursion above the CTR criterion for chlorodibromomethane.

Results of ambient monitoring indicate the SJR has assimilative capacity for chlorodibromomethane. Since there are no drinking water intakes in the vicinity of Discharge Point 001, and discharge of the secondary effluent can only occur when the river:flow ratio is 20:1, a dilution credit for chlorodibromomethane of up to 20:1 can be granted for the seasonal 70 mgd, based on the available human health dilution (see Attachment F, IV.C.2.b.). An AMEL and MDEL for chlorodibromomethane of 5.0 µg/L and 14.5 µg/L, respectively, are included in this Order for the secondary treated effluent discharge based on the CTR criterion for the protection of human health (See Attachment F, Table F-7 for WQBEL calculations). No effluent limitations are required for the year-round tertiary treated effluent.

The Discharger is unable to comply with these limitations. Section 2.1 of the SIP allows for compliance schedules within the permit for existing discharges where it is demonstrated that it is infeasible for a Discharger to achieve immediate compliance with a CTR criterion. Using the statistical methods for calculating interim effluent limitations described in Attachment F, Section IV.E.3., an interim performance-based maximum daily limitation of 16 µg/L was calculated.

Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.*" Section 2.1, further states that compliance schedules may be included in NPDES permits provided that the following justification has been submitted: …"*(a) documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream; (b) documentation of source control measures and/or pollution minimization measures efforts currently underway or completed; (c) a proposal for additional or future source control measures, pollutant minimization actions, or waste treatment (i.e., facility upgrades); and (d) a demonstration that the proposed schedule is as short as practicable*." On 25 March 2008, the Discharger submitted a request, and justification for compliance schedule for chlorodibromomethane. The compliance schedule justification included all items specified in Paragraph 3, items (a) through (d), of Section 2.1 of the SIP. The new water quality-based effluent limitations for chlorodibromomethane becomes effective on **18 May 2010**.

This Order requires the Discharger to submit a corrective action plan and implementation schedule to assure compliance with the final chlorodibromomethane effluent limitations. The interim limitation is in effect through **17 May 2010**. As part of the compliance schedule for chlorodibromomethane, the Discharger shall submit an engineering treatment feasibility study.

n. **Dichlorobromomethane.** The CTR includes a dichlorobromomethane criterion of 0.56 µg/L for the protection of human health and is based on a one-in-a-million cancer risk for waters from which both water and organisms are consumed. The

MEC for dichlorobromomethane was 27 µg/L, and the mean average concentration was 4.1 µg/L, based on 63 samples collected between December 2001 and April 2005, while the maximum observed upstream receiving water dichlorobromomethane concentration was 0.2 µg/L, based on 26 samples collected between February 2002 and August 2005. Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criterion for dichlorobromomethane. However, since dichlorobromomethane is a disinfection byproduct caused by the use of chlorine, and the year-round tertiary treated effluent will be disinfected using UV disinfection, not chlorination, the year-round tertiary treated effluent is not expected to contain dichlorobromomethane. Therefore, there is no reasonable potential for the year-round tertiary treated effluent to cause or contribute to an in-stream excursion above the CTR criterion for dichlorobromomethane.

The ambient monitoring demonstrates the receiving water has assimilative capacity for dichlorobromomethane. Since there are no drinking water intakes in the vicinity of Discharge Point 001, and discharge of the secondary effluent can only occur when the river:flow ratio is 20:1, a dilution credit for dichlorobromomethane of up to 20:1 can be granted for the seasonal 70 mgd, based on the available human health dilution (see Attachment F, IV.C.2.b.). An AMEL and MDEL for dichlorobromomethane of 6.4 µg/L and 17.1 µg/L, respectively, are included in this Order for the secondary treated effluent discharge based on the CTR criterion for the protection of human health (See Attachment F, Table F-6 for WQBEL calculations). No effluent limitations are required for the year-round tertiary treated effluent.

The Discharger is unable to comply with these limitations. Section 2.1 of the SIP allows for compliance schedules within the permit for existing discharges where it is demonstrated that it is infeasible for a Discharger to achieve immediate compliance with a CTR criterion. Using the statistical methods for calculating interim effluent limitations described in Attachment F, Section IV.E.3., an interim performance-based maximum daily limitation of 27 µg/L was calculated.

Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.*" Section 2.1, further states that compliance schedules may be included in NPDES permits provided that the following justification has been submitted: …"*(a) documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream; (b) documentation of source control measures and/or pollution minimization measures efforts currently underway or completed; (c) a proposal for additional or future source control measures, pollutant minimization actions, or waste treatment (i.e., facility upgrades); and (d) a demonstration that the proposed schedule is as short as practicable*." On 25 March 2008, the Discharger submitted a request, and justification for compliance schedule for dichlorobromomethane. The compliance schedule justification included all items

specified in Paragraph 3, items (a) through (d), of Section 2.1 of the SIP. The new water quality-based effluent limitations for dichlorobromomethane becomes effective on **18 May 2010**.

This Order requires the Discharger to submit a corrective action plan and implementation schedule to assure compliance with the final dichlorobromomethane effluent limitations. The interim limitation is in effect through **17 May 2010**. As part of the compliance schedule for dichlorobromomethane, the Discharger shall submit an engineering treatment feasibility study.

o. **Electrical Conductivity. (see Subsection z. Salinity)**

p. **Iron.** The Secondary MCL - Consumer Acceptance Limit for iron is 300 µg/L. The MEC for iron (total) was 360 µg/L, based on 35 samples collected between January 2002 and April 2005, while the maximum observed upstream receiving water iron concentration (total) was 4400 µg/L, and the average upstream receiving water iron concentration was 2,500 µg/L based on 27 samples collected between January 2002 and August 2005. Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Secondary MCL for iron. The SJR has exceeded the Secondary MCL for iron, therefore, no assimilative capacity is available in the receiving water for iron. An average annual effluent limitation (AAEL) of 300 µg/L for iron is included in this Order based on protection of the Basin Plan's narrative chemical constituents objective. Based on the sample results in the effluent, it appears the Discharger can meet this new limitation.

q. **Manganese.** The Secondary MCL - Consumer Acceptance Limit for manganese is 50 µg/L. The MEC for manganese was 30 µg/L, based on 23 samples collected between January 2002, and April 2005, while the maximum observed ambient receiving water manganese concentration was 640 µg/L, based on 27 samples collected between January 2002, and August 2005. Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Secondary MCL for manganese. The receiving water has exceeded the Secondary MCL for manganese. Therefore, no assimilative capacity is available in the receiving water for manganese. An AAEL of 50 µg/L for manganese is included in this Order based on protection of the Basin Plan's narrative chemical constituents objective. Based on the sample results in the effluent, it appears the Discharger can meet this new limitation.

r. **Mercury.** The current USEPA Ambient Water Quality Criteria for Protection of Freshwater Aquatic Life, continuous concentration, for mercury is 0.77 µg/L (30-day average, chronic criteria). The CTR contains a human health criterion 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 CFR 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.

From December 2001 through February 2006, the Discharger collected 43 effluent samples for total mercury. The maximum observed effluent mercury concentration was 19 ng/L (8 December 2004). The average of these 43 effluent samples was 4.0 ng/L. While these concentrations do not exceed the existing ambient water quality and human health criteria published by USEPA, the Sacramento-San Joaquin Delta has been listed as an impaired water body pursuant to Section 303(d) of the Clean Water Act for mercury, based on fish tissue concentration and not water column toxicity. The California DPH has issued health warnings regarding the consumption of fish from Delta waterways, and health advisories by the Cal/EPA Office of Environmental Health Hazard Assessment remain in effect for human consumption of fish in the Delta due to excessive concentrations of mercury in fish tissue. While the SJR is not identified as impaired for mercury on the California 303(d) list, additional loading resulting from the discharge from the Facility has the potential to cause or contribute to the impairment resulting from mercury bioaccumulation in the Delta.

The SIP recommends the Regional Water Board consider whether the mass loading of bioaccumulative pollutants should be limited in the interim to "*representative current levels*" pending development of applicable water quality standards or TMDL allocation. The intent is, at a minimum, to prevent further impairment while a TMDL for a particular bioaccumulative constituent is being developed. Any increase in loading of mercury to an already impaired water body would further degrade water quality.

Considering the observed 95th percentile effluent concentration of 8.2 ng/L and the permitted seasonal discharge of 70 mgd (243 days per year), the current annual mercury mass discharge from the facility would be 1.16 pounds. Therefore, an interim effluent mass limitations for mercury (total) of 1.16 pounds/year has been established in this Order to maintain the Discharger's current mercury loading to the SJR.

If the Regional Water Board determines that a mercury offset program is feasible for Dischargers subject to a NPDES permit, this Order may be reopened to reevaluate the interim mercury mass loading limitation(s) and the need for a mercury offset program.

s. **Molybdenum.** Molybdenum is a naturally occurring trace element, and one of 15 elements known to be essential to plant growth. While essential in trace concentrations, excess concentrations are known to bioaccumulate in certain plant species, causing molybdenosis in ruminants (especially cattle) grazing on forage containing concentrations above 10 parts per million (ppm). Studies indicate the impact of molybdenum contamination of forage depends on the quality and amount of irrigation water applied to the field, as well as on the type and leachability of the soil. Studies also indicate most soils irrigated with water containing more than 25 µg/l will eventually produce toxic forages (Vlek and Lindsey, 1977; R.S. Ayers and D.W. Westcot, Rome, 1985).

Table III-1 of the Basin Plan identifies objectives for molybdenum in the SJR, from the mouth of the Merced River to Vernalis. The maximum (total) concentration objective for molybdenum is identified as 15 µg/L, with a maximum monthly mean objective of 10 µg/L. These objectives were established considering irrigated agricultural water quality goals for molybdenum.
The previous Order No. 5-01-120 established final effluent limits for molybdenum of 15 µg/L as a maximum daily, and 10 µg/L as an average monthly effluent limitation. The Discharger could not comply with these final effluent limitations, and since the Basin Plan objective for molybdenum was established prior to 1995, a separate Cease and Desist Order No. 5-01-121 was issued to the Discharger.

The Discharger established an ongoing molybdenum pretreatment program that has resulted in local industries voluntarily reducing usage, including but not limited to acquiring reformulated chemical supplies. In addition, the Discharger, on 10 January 2006, established Headwork Local Limits for molybdenum (and other constituents of concern). All efforts have significantly reduced molybdenum concentrations in the final effluent discharge as evident by the most recent discharge season's monitoring results, obtained from December 2004, through May 2007, where the mean effluent concentration for molybdenum was 10.9 µg/L with a MEC of 21 µg/L (2 December 2004), and the standard deviation of these 67 samples was 3.7 µg/L. However, based on the MEC, the discharge has a reasonable potential to cause or contribute to an exceedance of the Basin Plan objective.

Results of monitoring for molybdenum in the SJR at the Patterson sampling station (upstream of the Facility outfall) indicate the SJR has assimilative capacity for molybdenum. During the period from December 2001 through May 2007, the maximum background concentration of molybdenum was reported as 8.0 µg/L (16 May 2007), and the mean concentration was reported as 4.6 µg/L considering 49 sampling events. As discussed in Section IV.C.2.b.vi. above, the effluent limitation calculation procedures in Section 1.4 of the SIP allow for the granting of a dilution credit for molybdenum based on the estimated flow of the SJR and the arithmetic mean flow of the effluent. A 20:1 dilution credit is allowed for the seasonal secondary discharge and a dilution credit of up to 38:1 may be allowed for the year-round tertiary discharge. Based on the allowable dilution credits, an AMEL and MDEL of 52 µg/L and 81 µg/L, is calculated respectively for the seasonal secondary discharge and an AMEL and MDEL of 90 µg/L and 142 µg/L, is calculated respectively for the year-round tertiary discharge. However, the Regional Water Board finds that granting of these dilution credits could allocate an unnecessarily large portion of the receiving water's assimilative capacity for molybdenum and could violate the Antidegradation Policy. For this reason, a performance-based effluent limitation is included in this Order that is calculated in the same way that interim limits are calculated (see Section IV.E.3 below). A MDEL for molybdenum of 23 µg/L is included in this Order for both the seasonal secondary discharge and the year-round tertiary discharge. The relaxation of the effluent limitations for molybdenum for the seasonal discharge is based on new information and is consistent with the anti-backsliding

requirements of the Clean Water Act and federal regulations. This change is also consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16. Any impact on existing water quality will be insignificant.

t. **Nitrite and Nitrate.** Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrite and nitrite to nitrate. Denitrification is a process that converts nitrate to nitrite or nitric oxide and then to nitrous oxide or nitrogen gas, which is then released to the atmosphere. Nitrate and nitrite are known to cause adverse health effects in humans. The California DPH has adopted Primary MCLs at Title 22 of the California Code of Regulations (CCR), Table 64431-A, for the protection of human health for nitrite and nitrate that are equal to 1 mg/L and 10 mg/L (measured as nitrogen), respectively. Title 22 CCR, Table 64431-A, also includes a primary MCL of 10,000 µg/L for the sum of nitrate and nitrite, measured as nitrogen.

USEPA has developed a primary MCL and an MCL goal of 1,000 µg/L for nitrite (as nitrogen). For nitrate, USEPA has developed Drinking Water Standards (10,000 µg/L as Primary Maximum Contaminant Level) and Ambient Water Quality Criteria for protection of human health (10,000 µg/L for non-cancer health effects). Recent toxicity studies have indicated a possibility that nitrate is toxic to aquatic organisms.

Inadequate or incomplete denitrification may result in the discharge of nitrate and/or nitrite to the receiving stream. The conversion of ammonia to nitrites and the conversion of nitrites to nitrates present a reasonable potential for the discharge to cause or contribute to an in-stream excursion above the Primary MCLs for nitrite and nitrate. Based on 81 samples collected from 1 January 2005, through 27 March 2002, the MEC for nitrite was 4.2 mg/L, and the MEC for nitrate was 11 mg/L, and therefore, the Seasonal discharge demonstrates reasonable potential to cause or contribute to an in-stream excursion above the MCLs. For the Seasonal Discharge, due to the 20:1 (River: Effluent) dilution requirement, and the fact that modeling and field observations have shown that complete mixing is assured prior to the nearest possible downstream drinking water intake, a dilution credit of 20:1 may be allowed in calculation of the WQBELs for nitrate and nitrite, resulting in AMELs for nitrate and nitrite of 102 mg/L and 13.6 mg/L, respectively. However, allocating the full assimilative capacity for these constituents is not consistent with the Antidegradation Policy (Resolution 68-16), and based on Facility performance, the Discharger can meet more stringent performance-based effluent limitations. Due to the requirement to remove ammonia (i.e. nitrify the wastewater) the current nitrate and nitrite levels are not representative of future levels after nitrification is required. The measure of Total Kjeldahl Nitrogen (TKN) provides the potential maximum concentrations of nitrate plus nitrite. Therefore, based on a MEC for TKN of 42 mg/L, an effluent limitation for nitrate plus nitrite of 42 mg/L is required in this Order.

The proposed Facility upgrades include nitrification/denitrification processes,

which should reduce nitrate and nitrite concentrations below the applicable water quality objectives. However, inadequate or incomplete denitrification may result in the discharge of elevated levels of nitrate and nitrite to the receiving water. Furthermore, the Discharger conducted an antidegradation analysis for the expanded discharge assuming a projected median nitrate concentration of 7.2 mg/L as N and projected median nitrite concentration of 0.8 mg/L a N. It is necessary to include effluent limitations for the year-round tertiary discharge to ensure protection of the beneficial uses of the receiving water and for compliance with the antidegradation policy (State Water Board Resolution 68-16). Thus, this Order contains AMELs for nitrite and nitrate of 1 mg/L and 10 mg/L, respectively, for the year-round tertiary discharge based on the MCLs. These effluent limitations are included in this Order to assure the treatment process adequately nitrifies and denitrifies the waste stream to protect the potential beneficial use of municipal and domestic supply.

u. **Oil and Grease.** The Basin Plan includes water quality objectives for oil and grease and floating material in surface waters, which states: "*Waters shall not contain oils, greases, waxes, or other materials 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*".

Based on information included in self-monitoring reports submitted by the Discharger, oil and grease concentrations in the effluent was non-detectable (minimum reported detection limit of <0.2 mg/L) in 8 of the 35 samples obtained during the period of December 2001 through May 2007. The maximum oil and grease effluent concentration was 8.3 mg/L, which was detected in the monitoring sample obtained on 5 May 2003, and the mean was 3.3 mg/L. Therefore, the discharge does not have a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative objectives for oil and grease and floating material. The previous permit, Order No. 5-01-120, did not include effluent limitations for oil and grease. This Order does not include effluent limitations for oil and grease because the discharge does not demonstrate a reasonable potential to exceed water quality objectives for oil and grease and floating material. However, this Order contains receiving water limitations for oil and grease, and floating materials as described further in section V.A. of this Fact Sheet.

v. **Organophosphorus (OP) Pesticides.** The SJR has been identified under the federal CWA Section 303(d) as an impaired waterbody due to elevated concentrations of diazinon and chlorpyrifos. Diazinon and chlorpyrifos are Organophosphorus (OP) Pesticides that have been used for the control of pests in both agricultural and urban settings. Recent changes to federal regulations have removed diazinon and chlorpyrifos from most urban uses. Currently the primary source of OP pesticide pollutant loading to the SJR is agricultural runoff. Studies conducted by Regional Water Board staff, the USGS, and the CA Department of Pesticide Registration (DPR) have shown that the most significant OP pesticide loading events occur in conjunction with heavy rainfall, during the orchard dormant spray season, and from irrigation runoff during the growing season.

The Regional Water Board completed a total maximum daily load (TMDL) for diazinon and chlorpyrifos in the Lower SJR and amended the Basin Plan to include water quality objectives and waste load allocations. The Basin Plan Amendment (Amendment) for the Control of Diazinon and Chlorpyrifos Runoff into the Lower SJR was adopted by the Regional Water Board on 21 October 2005, and was approved by the State Water Board on 2 May 2006. The Basin Plan Amendment was approved by the Office of Administrative Law on 30 June 2006, and is now state law. The amendment was approved by U.S. EPA and went into effect on 20 December 2006.

The Amendment "…*modifies the Basin Plan Chapter III (Water Quality Objectives) to establish site specific numeric objectives for chlorpyrifos and diazinon in the San Joaquin River, and identifies the requirement to meet the additive toxicity formula already in Basin Plan Chapter IV (Implementation), for the additive toxicity of diazinon and chlorpyrifos*."

The Amendment provides that: "*The Waste Load Allocations (WLA's) for all NPDES-permitted dischargers.. shall not exceed the sum (S) of one (1) as defined below.*

$$S = \left(\frac{Cd}{WQOd} + \frac{Cc}{WQOc} \right) \leq 1.0$$

where
Cd = diazinon concentration in µg/L of point source discharge for the WLA
Cc = chlorpyrifos concentration in µg/L of point source discharge for the WLA
WQOd = acute or chronic diazinon water quality objective in µg/L.
WQOc = acute or chronic chlorpyrifos water quality objective in µg/L.

Available samples collected within the applicable averaging period for the water quality objective will be used to determine compliance with the allocations and loading capacity. For purposes of calculating the sum (S) above, analytical results that are reported as "non-detectable" concentrations are considered to be zero."

Water Quality Objectives for diazinon and chlorpyrifos to be used in the additive toxicity WLA were included in the amendment and are incorporated into the Basin Plan as shown below:

TABLE III-2A SPECIFIC PESTICIDE OBJECTIVES		
PESTICIDE	**MAXIMUM CONCENTRATION AND AVERAGING PERIOD**	**APPLICABLE WATER BODIES**

Chlorpyrifos	0.025 µg/L; 1-hour average (acute)	San Joaquin River from Mendota Dam to Vernalis (Reaches include Mendota Dam to Sack Dam (70), Sack Dam to Mouth of Merced River (71), Mouth of Merced River to Vernalis (83))
	0.015 µg/L; 4-day average (chronic) Not to be exceeded more than once in a three year period.	
Diazinon	0.16 µg/L; 1-hour average (acute)	
	0.10 µg/L; 4-day average (chronic) Not to be exceeded more than once in a three year period.	

In terms of a schedule for compliance with the WLA the amendment provides that "*Compliance with applicable water quality objectives, load allocations, and waste load allocations for diazinon and chlorpyrifos in the San Joaquin River is required by December 1, 2010*."

Results of effluent monitoring conducted by the Discharger using Method EPA 614, from January 2002 through April 2005, indicate concentrations of diazinon and chlorpyrifos have been less than the analytical reporting limits, which have ranged from 0.2 µg/L to 0.02 µg/L. Diazinon and chlorpyrifos can now be analyzed using Method EPA 8141A, EPA Method 625M or equivalent GC/Ms method to reporting limits of 0.020 ug/L and 0.010 ug/L, respectively. Since diazinon and chlorpyrifos have not been detected in the effluent, this Order does not include effluent limitations for these pollutants. However, this Order includes new monitoring requirements that specify a lower reporting limit sufficient for comparison with the applicable diazinon and chlorpyrifos WQOs and for use in the additive toxicity calculation. If diazinon and/or chlorpyrifos are detected in the effluent at a level with the reasonable potential to exceed the WQOs, this Order may be reopened to include effluent limitations for diazinon and chlorpyrifos.

w. **Organochlorine Pesticides.** Alpha BHC (alpha-hexachlorocyclohexane), aldrin, beta endosulfan, beta BHC, heptachlor, lindane (gamma BHC), beta BHC, delta BHC, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, chlordane, dieldrin, endrin, endrin aldehyde, alpha endosulfan, endosulfan sulfate, heptachlor, heptachlor epoxide, and toxaphene are chlorinated hydrocarbon pesticides. DDT and Group A pesticides (aldrin, dieldrin, endrin, heptachlor, heptachlor epoxide, chlordane (total), hexachlorocyclohexane (total), endosulfan (total), and toxaphene) are identified on the California 303(d) List as pollutants of impairment of the SJR. DDT has been historically used as an insecticide, and the primary source of DDT noted in the 1998 303(d) List is agriculture. The source of Group A pesticides is also identified as agricultural use. Although banned from general use in 1972, scientific evidence suggests that DDT is both persistent and bioaccumulative in the environment. The Basin Plan requires that no individual pesticides shall be present in concentrations that adversely affect beneficial uses; discharges shall

not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses; total chlorinated hydrocarbon pesticides shall not be present in the water column at detectable concentrations; and pesticide concentrations shall not exceed those allowable by applicable antidegradation policies. The CTR contains numeric criteria for alpha BHC, aldrin, beta BHC, heptachlor, and lindane of 0.0039 µg/L, 0.00013 µg/L, 0.014 µg/L, 0.00021 µg/L, and 0.019 µg/L, respectively, for freshwaters from which both water and organisms are consumed. The CTR contains numeric criteria for beta endosulfan of 0.056 µg/L as a four-day average (chronic) and 0.22 µg/L as a one-hour average (acute) for the protection of freshwater aquatic life. The effluent was monitored for organo-chlorine pesticides, DDT, and PCBs on at least five occasions (monitoring sample frequency for individual constituents ranged from 5 to 8 occasions) during the period from January 2002, through February 2005. Results of effluent monitoring conducted by the Discharger indicate concentrations of Group A pesticides and DDT have been less than detectable levels, at laboratory minimum levels (ML's) specified by the SIP; therefore, this Order does not contain effluent limitations for these constituents.

x. **Pathogens**. Municipal and domestic supply is a potential beneficial use of the SJR, from the mouth of the Merced River to Vernalis, and water contact recreation, and agricultural irrigation supply, are existing beneficial uses. Considering the year round tertiary-level treated discharge and the lowest daily average flow since 1980 there is, at times, a possibility of less than 20:1 dilution. To protect these beneficial uses, the Regional Water Board finds that the year-round discharge must be disinfected and treated to a higher level to prevent disease. The principal infectious agents (pathogens) that may be present in raw sewage may be classified into three broad groups: bacteria, parasites, and viruses. Tertiary-level treatment, consisting of chemical coagulation, sedimentation, and filtration, has been found to remove approximately 99.5% of viruses. Filtration is an effective means of reducing viruses and parasites from the waste stream. The wastewater must be treated to tertiary standards (filtered), or equivalent, to protect contact recreational and food crop irrigation uses.

The California Department of Public Health (DPH) has developed reclamation criteria, CCR, Division 4, Chapter 3 (Title 22), for the reuse of wastewater. Title 22 requires that for spray irrigation of food crops, parks, playgrounds, schoolyards, and other areas of similar public access, wastewater must be adequately disinfected, oxidized, coagulated, clarified, and filtered so that the effluent total coliform levels do not exceed 2.2 MPN/100 m*l* as a 7-day median. As coliform organisms are living and mobile, it is impracticable to quantify an exact number of coliform organisms and to establish weekly average limitations. Instead, coliform organisms are measured as a most probable number and regulated based on a 7-day median limitation.

Title 22 also requires that recycled water used as a source of water supply for non-restricted recreational impoundments be disinfected tertiary recycled water that has been subjected to conventional treatment. A non-restricted recreational

impoundment is defined as "*…an impoundment of recycled water, in which no limitations are imposed on body-contact water recreational activities.*" Title 22 is not directly applicable to surface waters; however, the Regional Water Board finds that it is appropriate to apply an equivalent level of treatment to that required by California DPH's reclamation criteria because the receiving water is used for irrigation of agricultural land and for contact recreation purposes. To protect public health, California DPH recommends that when there is less than 20:1 dilution, discharges to receiving waters with contact recreation and food crop irrigation uses, shall be oxidized, coagulated, filtered and adequately disinfected to provide a median total coliform organisms concentration of 2.2 MPN/100 mL at some point in the treatment process. The stringent disinfection criteria of Title 22 are appropriate for the year-round discharge, since the receiving waters is used for contact recreation and food crop irrigation purposes, and at times does not provide a 20:1 receiving water to effluent dilution ratio. Coliform organisms are intended as an indicator of the effectiveness of the entire treatment train and the effectiveness of removing other pathogens. The method of treatment is not prescribed by this Order; however, wastewater must be treated to a level equivalent to that recommended by California DPH.

In addition to coliform testing, turbidity effluent limitations have been included as a second indicator of the effectiveness of the treatment process and to assure compliance with the required level of treatment. The tertiary treatment process, or equivalent, is capable of reliably meeting a turbidity limitation of 2 nephelometric turbidity units (NTU) as a daily average. Failure of the filtration system such that virus removal is impaired would normally result in increased particles in the effluent, which result in higher effluent turbidity. Turbidity has a major advantage for monitoring filter performance, allowing immediate detection of filter failure and rapid corrective action. Coliform testing, by comparison, is not conducted continuously and requires several hours, to days, to identify high coliform concentrations. Therefore, to ensure compliance with the California DPH recommended Title 22 disinfection criteria, weekly average effluent limitations are impracticable for turbidity.

For the year-round discharge, this Order contains effluent limitations and a tertiary level of treatment, or equivalent, necessary to protect the beneficial uses of the receiving water. In accordance with CWC section 13241, the Regional Water Board has considered the following:

i. The past, present and probable future beneficial uses of the SJR, from the mouth of the Merced River to Vernalis, include agricultural supply including both irrigation and stock watering, industrial process supply, body contact recreation, canoeing and rafting, and other non-body contact recreation, warm freshwater aquatic habitat, migration of aquatic organisms both warm and cold habitats, warm habitat spawning, reproduction, and/or early development, and wildlife habitat. Municipal and domestic supply (MUN) is identified as a potential beneficial use.

ii. The environmental characteristics of the hydrographic unit, including the quality of the available water, will be improved by the requirement to provide tertiary treatment for this wastewater discharge. Tertiary treatment will allow for the reuse of the undiluted wastewater for food crop irrigation and contact recreation activities that would otherwise be unsafe according to recommendations from the California DPH.

iii. Fishable and swimmable water quality conditions can be reasonably achieved through the coordinated control of all factors that affect water quality in the area.

iv. The economic impact of requiring an increased level of treatment has been considered. The Discharger estimates that capital improvements, including collection system and the Phase 1A and 1B wastewater treatment upgrades, will be $421 million. Operation and maintenance costs are projected to increase from $16 million in FY2007 to $20 million in FY2012. The Discharger currently has a monthly user charge of $14.26 that will increase to $35.72 by July 2011. The loss of beneficial uses within downstream waters, without the tertiary treatment requirement, which may include prohibiting the irrigation of food crops and prohibiting public access for contact recreational purposes, would have a detrimental economic impact. In addition to pathogen removal to protect irrigation and recreation, tertiary treatment may also aid in meeting discharge limitations for other pollutants, such as heavy metals, reducing the need for advanced treatment specific for those pollutants.

v. The requirement to provide tertiary treatment for this discharge will not adversely impact the need for housing in the area. The potential for developing housing in the area will be facilitated by improved water quality, which protects the contact recreation and irrigation uses of the receiving water. Any growth in the area will place greater demand on the available resources and will increase the potential for activities, such as contact recreation that needs an improved surface water quality. California DPH recommends that, in order to protect the public health, relatively undiluted wastewater effluent must be treated to a tertiary level for contact recreational and food crop irrigation uses. Without tertiary treatment, the downstream waters could not be safely utilized for contact recreation or the irrigation of food crops.

vi. It is the Regional Water Board's policy, (Basin Plan, page IV-12.00, Policy 2) to encourage the reuse of wastewater. The Regional Water Board requires dischargers to evaluate how reuse or land disposal of wastewater can be optimized. The need to develop and use recycled water is facilitated by providing a tertiary level of wastewater treatment that will allow for a greater variety of uses in accordance with CCR, Title 22.

vii. The Regional Water Board has considered the factors specified in CWC section 13263, including considering the provisions in CWC section 13241, in adopting the disinfection and filtration requirements under Title 22 criteria.

The Regional Water Board finds, on balance, that these requirements are necessary to protect the beneficial uses of the SJR, including water contact recreation and irrigation uses.

The establishment of tertiary limitations has not been previously required for this discharge. However, the Discharger is constructing new facilities that will be capable of meeting these new limitations for BOD, TSS, total coliform, and turbidity upon commencement of the year-round discharge. Therefore, a schedule for compliance with the tertiary treatment requirements is not included in this Order.

For the seasonal secondary discharge, coliform limits of 23 MPN/100 mL as a monthly median and 500 MPN/100 mL as a daily maximum have been imposed in previous Orders based upon site-specific recommendations from California DPH. In a letter to the Regional Water Board dated 8 April 1999, California DPH indicated that they would consider wastewater discharged to water bodies with identified beneficial uses of irrigation or contact recreation and where the wastewater receives dilution of more than 20:1 to be adequately disinfected if the effluent coliform concentration does not exceed 23 MPN/100 mL as a 7-day median and if the effluent coliform concentration does not exceed 240 MPN/100 mL more than once in any 30 day period. Therefore, this Order retains the requirement for 20:1 dilution for the secondary discharge, and includes new effluent limitations for total coliform which reflect the recommendations of California DPH.

y. **pH—**The Basin Plan includes a water quality objective for surface waters (except for Goose Lake) that the "…*pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses.*" Effluent Limitations for pH are included in this Order based on the Basin Plan objectives for pH.

z. **Salinity.** Salinity is a term used for the dissolved mineral concentration in water, typically measured as total dissolved solids (TDS), or electrical conductivity (EC). As noted previously, EC is identified on the California 303(d) List as a pollutant impairing the SJR. Salinity levels in the Lower SJR are affected by both the salt loads and the quantity of flow in the river. High salt loads result from a combination of upstream water diversions, discharges of saline drainage water, and subsurface accretions to the SJR from groundwater. Studies have indicated that non-point sources, primarily return flows from irrigated agriculture and wetland areas, contribute the majority of the controllable discharges of salt.

The Regional Water Board completed a total maximum daily load (TMDL) for Salt and Boron in the Lower SJR and amended the Basin Plan to include water quality objectives and waste load allocations. The Basin Plan Amendment for the Control of Salt and Boron Discharges into the Lower SJR (The BPA) was adopted by the Regional Water Board on 10 September 2004, by Resolution No. R5-2004-0108, and was approved by the State Water Board and by the Office of Administrative Law. The BPA is now state law, and went into effect on 28 July 2006. However, the compliance schedule was not originally approved by

U.S. EPA, because it was not specifically requested by the State Water Board. A request for approval of the compliance schedule was submitted later, which received U.S. EPA approval on 12 March 2008. According to the control program associated with the BPA, "*The salt and boron control program establishes salt load limits to achieve compliance at the Airport Way Bridge near Vernalis with salt and boron water quality objectives for the LSJR*.", and according to the TMDL report associated with the BPA, the two major NPDES permittees in this area (one of which is the Discharger) "*account for no more than two percent of the total salt load at Vernalis*." The control program establishes waste load allocations for point source discharges of salt in the basin, and the BPA includes compliance schedules to comply with the control program. The control program's goal *"is to achieve compliance with salt and boron water quality objectives without restricting the ability of dischargers to export salt out of the San Joaquin River basin…The Regional Board encourages real-time water quality management and pollutant trading of waste load allocations, load allocations, and supply water allocations as a means for attaining salt and boron water quality objectives while maximizing the export of salts out of the LSJR watershed*."

The Control Program provides that "*Existing NPDES point source dischargers are low priority and subject to the compliance schedules for low priority discharges in Table IV-6.. Low priority discharges have 16 years (Wet through Dry Water Year Types) and 20 years (Critical Water Year Types) from the effective date of the control program to comply with the TMDL allocations."*

The SWRCB 1995 Bay-Delta Plan contains salinity objectives for the SJR at Vernalis to protect agricultural and beneficial uses of water in the southern Delta. The existing salinity water quality objectives for the SJR at Vernalis are 1000 μS/cm between September 1 and March 31, and 700 μS/cm between April 1 and August 31.

The Discharger has no treatment facilities specific to salinity, and therefore, cannot currently comply with the final effluent limitations based on the control program waste load allocations. Results of monitoring conducted by the Discharger from November 2001 through May 2007 indicate average monthly EC effluent levels ranged from 987 μS/cm to 1265 μS/cm. EC levels in the SJR recorded at Patterson (CA DWR SJP Monitoring Station) during that same time period range from 148 μS/cm to 1829 μS/cm. Thus compliance with SWRCB 1995 Bay-Delta Plan salinity objectives for SJR at Vernalis could ultimately require use of reverse osmosis or similar salt removal technologies. The State Water Board has concluded that construction and operation of reverse osmosis facilities to treat discharges prior to implementation of other measures to reduce the salt load in SJR would be an unreasonable approach (Manteca Decision, WQ 2005-005, p. 14). However, the Regional Water Board recommends regulating discharges of salt to minimize increases in the Central Valley, and consideration of "*all possible interim approaches to continue controlling and regulating salts in a reasonable manner, and encourage all stakeholder groups that may be*

affected by the Regional Board's policy to actively participate in policy development."

Final water quality based effluent limitations for salinity have been established in this Order with full compliance required by 28 July 2022, or 28 July 2026, in accordance with the TMDL. Since the reduction in effluent salinity is a complex issue that may require the development of new lower salinity water supplies or other long-term solutions, the compliance schedule of 16-20 years is reasonable and necessary. Consistent with the Regional Water Board's recommendations, this Order requires the Discharger to develop and implement a salinity source control program that will identify and implement measures to reduce salinity in the discharge to the SJR, and to participate financially in the development of the Central Valley Salinity Management Plan at a level commensurate with its contributions of salinity to the SJR. This Order contains interim performance based effluent limitations for EC, and an EC goal based on the weighted average of the Discharger's water supply plus an increment of 500 μS/cm.

aa. **Selenium.** Selenium is a trace element which, under certain conditions, can be mobilized and cause both acute and chronic toxicity to fish and wildlife. Selenium is also an essential trace nutrient for many aquatic and terrestrial species. The SJR was placed on the California 303(d) List in 1988 because ambient water column concentrations exceeded the USEPA chronic freshwater criteria for selenium of 5 µg/l. Irrigation of soils composed, in part, of historical marine sediments results in the leaching of selenium and salt into the shallow groundwater, and subsurface agricultural drainage have been identified as primary sources of selenium loading to the SJR. In 1996 the Regional Water Board adopted a Basin Plan Amendment for the Regulation of Agricultural Subsurface Drainage, which contained selenium water quality objectives for the main stem of the SJR downstream of the Merced River. Table III-1of the Basin Plan contains water quality objectives for selenium in the SJR, from the mouth of the Merced River to Vernalis, as a maximum (total) concentration of 12 µg/l and a four-day maximum average objective of 5 µg/l. These water quality objectives were established for protection of aquatic life**.** USEPA also established CTR criteria for the protection of freshwater aquatic life for selenium. The CTR continuous concentration (four-day average) and the maximum concentration (one-hour average) criteria for selenium are 5.0 µg/l and 20 µg/l, respectively.

Results of monitoring from December 2001 and March 2006 indicate the MEC for selenium was 6.0 µg/L (15 December 2004), considering 65 effluent samples. The maximum observed upstream receiving water selenium concentration was 6.0 µg/L (13 February 2003), based on results of 30 samples, indicating that there is no assimilative capacity and dilution credits cannot be allowed. Based on the effluent and receiving water data, the discharge demonstrates reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan water quality objectives for selenium. Previous Order No. 5-01-120 contained final maximum daily and average monthly effluent limitations for selenium (total) of 8.2 µg/L and 4.1 µg/L respectively, based on the Basin Plan's water quality

objectives. This Order continues the effluent limitations required in previous Order No. 5-01-120.

bb. **Settleable Solids.** For inland surface waters, the Basin Plan states that "[w]ater shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses."
The previous permit, Order No. 5-01-120 required a daily maximum effluent limitation of 0.2 ml/L and a monthly average effluent limit of 0.1 ml/L for settleable solids. Analytical monitoring results obtained since issuance of the previous permit showed that settleable solids was never detected above 0.1 ml/L. Therefore, the discharge does not demonstrate a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative objectives for settleable solids. Based on this new information, this Order does not include effluent limitations for settleable solids; however, this Order requires effluent monitoring and contains a receiving water limitation for Settleable Substances to prevent deposition of material that causes nuisance or adversely affects beneficial uses as described further in section V.A. of this Fact Sheet.
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cc. **Toxicity.** See Section IV.C.5. of the Fact Sheet regarding whole effluent toxicity.

4. WQBEL Calculations

a. Effluent limitations for aluminum, ammonia, chloride, carbon tetrachloride, chlorodibromomethane, and dichlorobromomethane were calculated in accordance with section 1.4 of the SIP. The performance-based effluent limitation for molybdenum was calculated as the mean plus 3.3 standard deviations based on the most recent monitoring data (See previous section IV.C.3.s of this Fact Sheet). The nitrate and nitrite effluent limitations for the year-round discharge were established from California DPH's recommended Primary MCLs, and the performance-based nitrate plus nitrite effluent limitation for the seasonal discharge was based on a MEC for Total Kjeldahl Nitrogen of 42 mg/L. The effluent limitations for iron, and manganese were established from the secondary MCLs. The following paragraphs describe the methodology used in accordance with the SIP for calculating effluent limitations.

b. **Effluent Limitation Calculations.** In calculating maximum effluent limitations, the effluent concentration allowances were set equal to the criteria/standards/objectives.

$$ECA_{chronic} = CCC + \mathrm{D(CCC - B)} \qquad ECA_{acute} = CMC + \mathrm{D(CMC - B)}$$

For the human health, agriculture, or other long-term criterion/objective, a dilution credit can be applied. The ECA is calculated as follows:

$$ECA_{HH} = HH + D(HH - B)$$

<u>where:</u>

ECA_{acute} = effluent concentration allowance for acute (one-hour average) toxicity criterion

$ECA_{chronic}$ = effluent concentration allowance for chronic (four-day average) toxicity criterion

ECA_{HH} = effluent concentration allowance for human health, agriculture, or other long-term criterion/objective

CMC = criteria maximum concentration (one-hour average)

CCC = criteria continuous concentration (four-day average, unless otherwise noted)

HH = human health, agriculture, or other long-term criterion/objective

D = dilution credit

B = maximum receiving water concentration

Acute and chronic toxicity ECAs were then converted to equivalent long-term averages (LTA) using statistical multipliers and the lowest is used. Additional statistical multipliers were then used to calculate the maximum daily effluent limitation (MDEL) and the average monthly effluent limitation (AMEL).

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

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

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

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

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

Water quality-based effluent limitations were calculated for ammonia, chloride, carbon tetrachloride, dichlorobromomethane, and chlorodibromomethane, as follows in Tables F-4 through F-9, below.

Table F-4. WQBEL Calculations for Ammonia

	Annual CV[1] = 0.86		
	Acute	Chronic	
		30-day	4-day
Criteria (mg/L) [(2)]	2.14	1.78	4.46
Dilution Credit	No Dilution	No Dilution	No Dilution
ECA	2.14	1.78	4.46
ECA Multiplier	0.23	0.7 [(3)]	0.42
LTA	0.50	1.26	1.87
AMEL Multiplier (95th%)	1.81	[(4)]	[(4)]
AMEL (mg/L)	**0.9**	[(4)]	[(4)]
MDEL Multiplier (99th%)	4.27	[(4)]	[(4)]
MDEL (mg/L)	**2.1**	[(4)]	[(4)]

(1) Coefficient of Variation
(2) USEPA Ambient Water Quality Criteria
(3) Calculated based on the TSD modification presented in the 22 December 1999 Federal Register notice where $\sigma^2 = \ln(CV^2/30 + I)$
(4) Limitations based on acute LTA ($LTA_{acute} < LTA_{chronic}$)

Table F-5. WQBEL Calculations for Chloride

	Acute	Chronic
Criteria, dissolved (mg/L) [(1)]	860	230
Dilution Credit	No Dilution	No Dilution
Translator	N/A	N/A
ECA[(2)]	860	230
ECA Multiplier [(3)]	0.66	0.80
LTA	563	185
AMEL Multiplier (95th%) [(4)(5)]	[(7)]	1.16
AMEL (µg/L)	[(7)]	**216**
MDEL Multiplier (99th%) [(6)]	[(7)]	1.53
MDEL (µg/L)	[(7)]	**282**

(1) USEPA Ambient Water Quality Criteria for protection of aquatic life.
(2) ECA calculated per section 1.4.B, Step 2 of SIP.
(3) Acute and Chronic ECA Multiplier calculated at 99th percentile per section 1.4.B, Step 3 of SIP or per sections 5.4.1 and 5.5.4 of the TSD.
(4) Assumes sampling frequency n=>4.
(5) The probability basis for AMEL is 95th percentile per section 1.4.B, Step 5 of SIP or section 5.5.4 of the TSD.
(6) The probability basis for MDEL is 99th percentile per section 1.4.B, Step 5 of SIP or section 5.5.4 of the TSD.
(7) Limitations based on acute LTA (Acute LTA < Chronic LTA)

Table F-6. WQBEL Calculations for Dichlorobromomethane

	Human Health
Criteria (µg/L)	0.56
Dilution Credit	20:1
Background[(1)]	0.27
ECA	6.4
AMEL (µg/L) [(2)]	**6.4**
MDEL/AMEL Multiplier[(3)]	2.7

MDEL (µg/L)	**17.1**

(1) Arithmetic Mean per section 1.4.3.2 of SIP
(2) AMEL = ECA per section 1.4.B, Step 6 of SIP
(3) Assumes sampling frequency n<=4. Uses MDEL/AMEL multiplier from Table 2 of SIP.

Table F-7. WQBEL Calculations for Chlorodibromomethane

	Human Health
Criteria (µg/L)	0.41
Dilution Credit	20:1
Background(1)	0.18
ECA	5.0
AMEL (µg/L) (2)	**5.0**
MDEL/AMEL Multiplier(3)	2.89
MDEL (µg/L)	**14.5**

(1) Arithmetic Mean per section 1.4.3.2 of SIP
(2) AMEL = ECA per section 1.4.B, Step 6 of SIP
(3) Assumes sampling frequency n<=4. Uses MDEL/AMEL multiplier from Table 2 of SIP.

Table F-8. WQBEL Calculations for Carbon Tetrachloride

	Human Health
Criteria (µg/L)	0.25
Dilution Credit	20:1
Background(1)	0.04
ECA	0.25
AMEL (µg/L) (2)	**4.5**
MDEL/AMEL Multiplier(3)	2.0
MDEL (µg/L)	**8.9**

(1) Lowest of the reported detection levels per section 1.4.3.2 of SIP
(2) AMEL = ECA per section 1.4.B, Step 6 of SIP
(3) Assumes sampling frequency n<=4. Uses MDEL/AMEL multiplier from Table 2 of SIP.

Table F-9. WQBEL Calculations for Aluminum

	Acute	Chronic
Criteria (µg/L) (1)	750	750
Dilution Credit	No Dilution	No Dilution
ECA	750	750
ECA Multiplier	0.32	0.53
LTA	240	395
AMEL Multiplier (95th%)	1.6	(2)
AMEL (µg/L)	373	**(2)**
MDEL Multiplier (99th%)	3.1	(2)
MDEL (µg/L)	750	**(2)**

(1) USEPA Ambient Water Quality Criteria
(2) Limitations based on acute LTA (Acute LTA < Chronic LTA)

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 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 states that "…*effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate*…". Effluent limitations for acute toxicity have been included in this Order.

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 III-8.00). Adequate WET data is not available to determine if the discharge has reasonable potential to cause or contribute to an in-stream excursion above of the Basin Plan's narrative toxicity objective. Attachment E of this Order requires monthly chronic WET monitoring for demonstration of compliance with the narrative toxicity objective.

   In addition to WET monitoring, Special Provisions VI.C.2.a. requires the Discharger to submit to the Regional Water Board an Initial Investigative TRE Work Plan for approval by the Executive Officer, to ensure the Discharger has a plan to immediately move forward with the initial tiers of a TRE, in the event effluent toxicity is encountered in the future. The provision also includes a numeric toxicity monitoring trigger and requirements for accelerated monitoring, as well as, requirements for TRE initiation if a pattern of toxicity is demonstrated.

D. Final Effluent Limitations

1. Mass-based Effluent Limitations.

Title 40 CFR 122.45(f)(1) requires effluent limitations be expressed in terms of mass, with some exceptions, and 40 CFR 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 CFR 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 MCLs) and mass limitations are not necessary to protect the beneficial uses of the receiving water.

Mass-based effluent limitations were calculated based upon the permitted average daily discharge flow allowed in Section IV.A.1.f., and IV.A.2.g. of the Limitations and Discharge Requirements.

2. Averaging Periods for Effluent Limitations.

Title 40 CFR 122.45 (d) requires average weekly and average monthly discharge limitations for publicly owned treatment works (POTWs) unless impracticable. For some pollutants, the effluent limitations use different averaging periods in this Order, as explained below.

For toxic pollutants and pollutant parameters in water quality permitting, the US EPA recommends the use of a maximum daily effluent limitation in lieu of average weekly effluent limitations for two reasons. "*First, the basis for the 7-day average for POTWs derives from the secondary treatment requirements. This basis is not related to the need for assuring achievement of water quality standards. Second, a 7-day average, which could comprise up to seven or more daily samples, could average out peak toxic concentrations and therefore the discharge's potential for causing acute toxic effects would be missed.*" (TSD, pg. 96) This Order utilizes maximum daily effluent limitations in lieu of average weekly effluent limitations for ammonia, chlorine residual[5], chloride, carbon tetrachloride, dichlorobromomethane, chlorodibromomethane, selenium, and molybdenum as recommended by the TSD for the achievement of water quality standards and for the protection of the beneficial uses of the receiving stream. Furthermore, for BOD, TSS, pH, coliform, and turbidity, weekly average effluent limitations have been replaced or supplemented with effluent limitations utilizing shorter averaging periods. The rationale for using shorter averaging periods for these constituents is discussed in Attachment F, Section IV.C.3., above.

For effluent limitations based on Primary and Secondary MCLs, except nitrate and nitrite, this Order includes annual average effluent limitations. The Primary and

[5] This Order applies the USEPA National Ambient Water Quality Criteria for chlorine directly as effluent limitations (1 hour average, acute, and 4-day average, chronic). See Section IV.C.3.k, above, for rational regarding the chlorine residual effluent limitations.

Secondary MCLs are drinking water standards contained in Title 22 of the California Code of Regulations. Title 22 requires compliance with these standards on an annual average basis (except for nitrate and nitrite) when sampling at least quarterly. Since it is necessary to determine compliance on an annual average basis, it is impracticable to calculate average weekly and average monthly effluent limitations.

3. Satisfaction of Anti-Backsliding Requirements.

Some limitation in this Order are less stringent than those in the previous permit, Order No. 5-01-120. This relaxation of the effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations, as discussed in detail below.

Copper. Order No. 5-01-120 required effluent limitations for copper. However, recent studies show, and the Regional Water Board concurs, that for copper the lowest effluent hardness may be used for determining the applicable water quality criteria that is both reasonable and fully protective of the beneficial uses of the receiving water (See previous section IV.C.2.c.Hardness for detailed discussion). Copper concentrations in both the effluent and the receiving water monitoring results were detected below the hardness-dependent criteria for the protection of freshwater aquatic life, which is based upon this new information (For detailed discussion see previous section IV.C.3.l.). This Order removes the effluent limitations for copper because the discharge does not demonstrate a reasonable potential to cause or contribute to an in-stream excursion of the CTR criteria for copper.

Molybdenum. Order No. 5-01-120 required a daily maximum effluent limitation of 15 µg/L and a monthly average effluent limitation of 10 µg/L for molybdenum, which was based on the Basin Plan's water quality objectives for molybdenum in the SJR, established for protection of the agricultural supply beneficial use. The previous Order did not grant dilution because one ambient monitoring result obtained on 8 April 1994 was reported as 87 ug/L, which exceeds the Basin Plan's water quality objectives for molybedum. However, during the period from December 2001 through May 2007, 49 sampling events occurred that indicated the maximum background concentration of molybdenum as 8.0 µg/L (16 May 2007), and the mean concentration as 4.6 µg/L. Based on this new information, there is now dilution available in the receiving water; therefore, this Order grants a dilution credit for molybdenum. As discussed in Section IV.C.2.b.vi of this Fact Sheet, a 20:1 dilution credit is allowed for the seasonal secondary discharge and a dilution credit of up to 38:1 may be allowed for the year-round tertiary discharge. However, the Regional Water Board finds that granting of these dilution credits could allocate an unnecessarily large portion of the receiving water's assimilative capacity for molybdenum and could violate the Antidegradation Policy. To hold the discharge at current levels, this Order requires a daily maximum effluent limitation of 23 µg/L, which is calculated in the same way that interim limits are calculated (see Section IV.E.3 below). Based upon the new information (refer to previous section IV.C.3.s), this limit is protective of the beneficial uses of the receiving water.

Settleable Solids. Order No. 5-01-120 required a daily maximum effluent limitation of 0.2 ml/L and a monthly average effluent limitation of 0.1 ml/L for settleable solids. Analytical monitoring results obtained since issuance of the previous permit showed that settleable solids was never detected above 0.1 ml/L. Based on this new information, this Order does not contain the previously required effluent limitations for settleable solids because the discharge does not demonstrate a reasonable potential to cause or contribute to an in-stream excursion.

4. Satisfaction of Antidegradation Policy

The Discharger developed a report titled, *City of Modesto Antidegradation Analysis for Proposed Wastewater Quality Control Facility Discharge Modification,* June 2007, (Larry Walker & Associates) that provides a complete antidegradation analysis following the guidance provided by State Water Board APU 90-004. Pursuant to the guidelines, the Report evaluated whether changes in water quality resulting from the proposed capacity increase (4.8 mgd year-round tertiary treated discharge) are consistent with the maximum benefit to the people of the state, will not unreasonably affect beneficial uses, will not cause water quality to be less than water quality objectives, and that the discharge provides protection for existing in-stream uses and water quality necessary to protect those uses.

Based on the Antidegradation Analysis provided by the Discharger, the Regional Water Board finds that the permitted surface water discharge is consistent with the antidegradation provisions of CFR Part 131.12 and State Water Resources Control Board Resolution 68-16. This Order allows for an increase in the volume and mass of pollutants discharged to the SJR, by allowing an increased year-round discharge flow of 4.8 mgd. The increase in the discharge allows wastewater utility service necessary to accommodate housing and economic expansion in the area, and is considered to be a benefit to the people of the State. The discharge is a Title 22, or equivalent, tertiary-level treated wastewater, which is a high level of treatment of sewage waste that is considered best practicable treatment or control (BPTC) for most constituents in the wastewater and will result in attaining water quality standards applicable to the discharge.

5. Summary of Final Effluent Limitations

The final effluent limitations are summarized below in Tables F-10, and F-11

Table F-10. Final Effluent Limitations – Seasonal Discharge

Parameter	Units	Effluent Limitations					Basis
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
5-Day BOD @ 20 °C	mg/L	30	45	90	--	--	
	lbs/day	17,514[1]	26,271[1]	52,542[1]	--	--	
	%	85[2]	--	--	--	--	
Total Suspended Solids	mg/L	45	60	105	--	--	
	lbs/day	26,271[1]	35,028[1]	61,299[1]	--	--	
	%	85[2]	--	--	--	--	
pH	SU	--	--	--	6.5	8.5	BP
Ammonia	mg/L	0.9	--	2.1	--	--	
	lbs/day	525[1]	--	1,226[1]	--	--	
Aluminum (Total)	µg/L	373	200[8]	750	--	--	
Carbon Tetrachloride	µg/L	4.5	--	8.9	--	--	
Chloride	mg/L	216	--	282	--	--	
Chlorodibromomethane	µg/L	5.0	--	14.5	--	--	
Dichlorobromomethane	µg/L	9.6	--	25.7	--	--	
Electrical Conductivity[9]							
Iron (Total)	µg/L	300[8]	--	--	--	--	
Manganese	µg/L	50[8]	--	--	--	--	
Molybdenum (Total)	µg/L		--	23	--	--	
Selenium (Total)	µg/L	4.1	--	8.2	--	--	
Nitrate + Nitrite (as N)	mg/L	42	--	--	--	--	
	lbs/day	24,520	--	--	--	--	
Acute Toxicity	%	70[3]	--	90[3]	--	--	
Total Residual Chlorine	mg/L	0.01[4]	--	0.02[5]	--	--	
Total Coliform Organisms	MPN	--	23[6]	240[7]	--	--	
Flow		--	--	70[8]	--	--	

1 Based on a design flow of 70 mgd.
2 The average monthly percent removal of BOD 5-day 20C and total suspended solids shall not be less than 85 percent.
3 Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than; 1) 70% for any one bioassay, or 2) 90% median for any three consecutive bioassays.
4 4-day average
5 1-hour average
6 7-day median
7 Shall not be exceeded more than once in any 30-day period.
8 Annual Average
9 The discharge of electrical conductivity @ 25ºC during the periods from 1 October – 31 March shall not exceed 1000 µmhos/cm as a monthly average, and from 1 April – 31 May shall not 700 µmhos/cm as a monthly average. Compliance with these final effluent limitations is not required until 28 July 2022 or 28 July 2026.

Table F-11. Final Effluent Limitations – Year-Round Discharge

Parameter	Units	Effluent Limitations					Basis
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
5-Day BOD @ 20 °C	mg/L	10	15	20	--	--	
	lbs/day	400[1]	600[1]	800[1]	--	--	
	%	85[2]	--	--	--	--	
Total Suspended Solids	mg/L	10	15	20	--	--	
	lbs/day	400[1]	600[1]	800[1]	--	--	
	%	85[2]	--	--	--	--	
pH	SU	--	--	--	6.5	8.5	BP
Ammonia	mg/L	0.9	--	2.1	--	--	
	lbs/day	36[1]	--	84[1]	--	--	
Aluminum (Total)	µg/L	373	200[10]	750	--	--	
Chloride	mg/L	216	--	282	--	--	
Electrical Conductivity[11]							
Molybdenum (Total)	µg/L	10	--	15	--	--	
Nitrate (as N)	mg/L	10	--	--	--	--	
	lbs/day	400	--	--	--	--	
Nitrite (as N)	mg/L	1	--	--	--	--	
	lbs/day	40	--	--	--	--	
Selenium (Total)	µg/L	4.1	--	8.2	--	--	
Manganese	µg/L	50[10]	--	--	--	--	
Iron (Total)	µg/L	300[10]	--	--	--	--	
Acute Toxicity	%	70[3]	--	90[3]	--	--	
Total Residual Chlorine	mg/L	0.01[4]	--	0.02[5]	--	--	
Total Coliform Organisms	MPN	--	2.2[6]	23[7]	--	240[8]	
Turbidity[9]	NTU			2		10	
Flow		--	--	4.8[10]	--	--	

1 Based on a design flow of 4.8 mgd.
2 The average monthly percent removal of BOD 5-day 20C and total suspended solids shall not be less than 85 percent.
3 Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than; 1) 70% for any one bioassay, or 2) 90% median for any three consecutive bioassays.
4 4-day average
5 1-hour average
6 7-day median
7 Shall not be exceeded more than once in any 30-day period.
8 Shall not be exceeded at any time.
9 Effluent turbidity shall not exceed 2 NTU, as a daily average; 5 NTU, more than 5% of the time during a 24-hour period; and 10 NTU at any time.
10 Annual Average
11 The discharge of electrical conductivity @ 25ºC during the periods from 1 October – 31 March shall not exceed 1000 µmhos/cm as a monthly average, and from 1 April – 31 May shall not 700 µmhos/cm as a monthly average. Compliance with these final effluent limitations is not required until 28 July 2022 or 28 July 2026.

E. Interim Effluent Limitations

1. **Mercury.** See Section IV.C.3.r. for the rationale for the interim effluent limitations for mercury.

2. **Salinity.** The interim salinity limitations consist of an average monthly effluent limitation for EC derived using effluent data collected from December 2004 through May 2007. This Order includes an average monthly effluent limitation for EC of 1,341 µmhos/cm, and the derivation of these limitations is summarized below (for further details, refer to the following section IV.E.3. of this Fact Sheet):

Monthly Averages	EC (µmhos/cm)
Number of Observations	19
Minimum	1000
Observed Maximum	***1265***
Mean	1120
Standard Deviation	67
Projected Maximum	**1341 (µmhos/cm)**

3. **Ammonia, Chlorodibromomethane, and Dichlorobromomethane.** The SIP, section 2.2.1, requires that if a compliance schedule is granted for a CTR or NTR constituent, the Regional Water Board shall establish interim requirements and dates for their achievement in the NPDES permit. The interim limitations must be based on current treatment plant performance or existing permit limitations, whichever is more stringent. The State Water Board has held that the SIP may be used as guidance for non-CTR constituents; therefore, the SIP requirement for interim effluent limitations has been applied to both CTR and non-CTR constituents in this Order.

   The ammonia limitations from the previous Order were established as interim limits in this Order, because the final "floating" ammonia limitations (see IV.A.3.d. in the Limitations and Discharger Requirements section of this Order) are more stringent than a performance-based limit calculated as 24 mg/L. The interim limitations for chlorodibromomethane, and dichlorobromomethane in this Order are based on the current treatment plant performance. In developing these interim limitations, where there are ten sampling data points or more, sampling and laboratory variability is accounted for by establishing interim limits that are based on normally distributed data where 99.9% of the data points will lie within 3.3 standard deviations of the mean (*Basic Statistical Methods for Engineers and Scientists, Kennedy and Neville, Harper and Row*). Therefore, the interim limitations in this Order are established as the mean plus 3.3 standard deviations of the available data. In situations where the observed maximum effluent concentration (MEC) exceeds the 99.9%, the MEC is used as the interim limit.

   The Regional Water Board finds that the Discharger can undertake source control and treatment plant measures to maintain compliance with the interim limitations

included in this Order. Interim limitations are established when compliance with effluent limitations cannot be achieved by the existing discharge. Discharge of constituents in concentrations in excess of the final effluent limitations, but in compliance with the interim effluent limitations, can significantly degrade water quality and adversely affect the beneficial uses of the receiving stream on a long-term basis. The interim limitations, however, establish an enforceable ceiling concentration until compliance with the effluent limitation can be achieved.

Table F-12 summarizes the calculations of the interim effluent limitations for chlorodibromomethane and dichlorobromomethane:

Table F-12. Interim Effluent Limitation Calculation Summary

Parameter	MEC	Mean	Std. Dev.	# of Samples	Interim Limitation
Chlorodibromomethane	16	2.0	3.0	63	16
Dichlorobromomethane	27	4.0	3.5	63	27

[1] 87% were non-detects, interim limit calculated in accordance with Table 5-2 of the TSD.

F. Land Discharge Specifications – Not Applicable

G. Reclamation Specifications – Not Applicable

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

Basin Plan water quality objectives to protect the beneficial uses of surface water and groundwater include numeric objectives and narrative objectives, including objectives for chemical constituents, toxicity, and tastes and odors. The toxicity objective requires that surface water and groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, animals, or aquatic life. The chemical constituent objective requires that surface water and groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use or that exceed the maximum contaminant levels (MCLs) in Title 22, CCR. The tastes and odors objective states that surface water and groundwater shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. The Basin Plan requires the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, toxic substances, radionuclides, or taste and odor producing substances in concentrations that adversely affect domestic drinking water supply, agricultural supply, or any other beneficial use.

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 Regional 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 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 bacteria, biostimulatory substances, chemical constituents, color, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, sediment, settleable material, suspended material, tastes and odors, temperature, toxicity, and turbidity.

Numeric Basin Plan objectives for bacteria, dissolved oxygen, pH, temperature, and turbidity are applicable to this discharge and have been incorporated as Receiving Surface Water Limitations. Rational for these numeric receiving surface water limitations are as follows:

a. **Bacteria.** The Basin Plan includes a water quality objective that "*[I]n water designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 ml*." . Numeric Receiving Water Limitations for bacteria are included in this Order and are based on the Basin Plan objective.

b. **Biostimulatory Substances**. The Basin Plan includes a water quality objective that "*[W]ater shall not contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.".* Receiving Water Limitations for biostimulatory substances are included in this Order and are based on the Basin Plan objective.

c. **Color**. The Basin Plan includes a water quality objective that "*[W]ater shall be free of discoloration that causes nuisance or adversely affects beneficial uses."* Receiving Water Limitations for color are included in this Order and are based on the Basin Plan objective.

d. **Chemical Constituents**. The Basin Plan includes a water quality objective that *"[W]aters shall not contain chemical constituents in concentrations that adversely affect beneficial uses."* Receiving Water Limitations for chemical constituents are included in this Order and are based on the Basin Plan objective.

e. **Dissolved Oxygen.** The SJR, from the mouth of the Merced River to Vernalis, has been designated as having the beneficial use of spawning, reproduction, and/or early development (SPWN). For water bodies designated as having SPWN as a beneficial use, the Basin Plan includes a water quality objective of maintaining a minimum of 7.0 mg/L of dissolved oxygen. Since the beneficial use of SPWN does apply to the SJR, a receiving water limitation of 7.0 mg/L for dissolved oxygen was included in this Order.

   For surface water bodies outside of the Delta, the Basin Plan includes the water quality objective that "…*the monthly median of the mean daily dissolved oxygen (DO) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of*

saturation." This objective was included as a receiving water limitation in this Order.

f. **Floating Material**. The Basin Plan includes a water quality objective that *"[W]ater shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses."*. Receiving Water Limitations for floating material are included in this Order and are based on the Basin Plan objective.

g. **Oil and Grease**. The Basin Plan includes a water quality objective that *"[W]aters shall not contain oils, greases, waxes, or other materials 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."* Receiving Water Limitations for oil and grease are included in this Order and are based on the Basin Plan objective.

h. **pH.** The Basin Plan includes water quality objective that *"[T]he pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses*". This Order includes receiving water limitations for both pH range and pH change.

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

i. **Pesticides**. The Basin Plan includes a water quality objective for pesticides beginning on page III-6.00. Receiving Water Limitations for pesticides are included in this Order and are based on the Basin Plan objective.

j. **Radioactivity**. The Basin Plan includes a water quality objective that *"[R]adionuclides shall not be present in concentrations that are harmful to human, plant, animal or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or aquatic life."* The Basin Plan states further that *"[A]t a minimum, waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the maximum contaminant levels (MCLs) specified in Table 4 (MCL Radioactivity) of Section 64443 of Title 22 of the California Code of Regulations…"* Receiving Water Limitations for radioactivity are included in this Order and are based on the Basin Plan objective.

k. **Sediment.** The Basin Plan includes a water quality objective that *"[T]he 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"* Receiving Water Limitations for suspended sediments are included in this Order and are based on the Basin Plan objective.

l. **Settleable Material.** The Basin Plan includes a water quality objective that *"[W]aters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses."* Receiving Water Limitations for settleable material are included in this Order and are based on the Basin Plan objective.

m. **Suspended Material.** The Basin Plan includes a water quality objective that *"[W]aters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses."* Receiving Water Limitations for suspended material are included in this Order and are based on the Basin Plan objective.

n. **Taste and Odors**. The Basin Plan includes a water quality objective that *"[W]ater 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.".* Receiving Water Limitations for taste- or odor-producing substances are included in this Order and are based on the Basin Plan objective.

o. **Temperature.** The SJR, from the mouth of the Merced River to Vernalis, has the beneficial uses of SPWN, WARM, and COLD Migration. The Basin Plan includes the objective that "[a]*t no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5ºF above natural receiving water temperature*.". This Order includes a receiving water limitation based on this objective.

p. **Toxicity**. The Basin Plan includes a water quality objective that *"[A]ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life."* Receiving Water Limitations for toxicity are included in this Order and are based on the Basin Plan objective.

q. **Turbidity.** The Basin Plan includes a water quality objective that "*[I]ncreases in turbidity attributable to controllable water quality factors shall not exceed the following limits:*

- *Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.*
- *Where natural turbidity is between 5 and 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*."

A numeric Receiving Surface Water Limitation for turbidity is included in this Order and is based on the Basin Plan objective for turbidity.

B. Groundwater – Not Applicable

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

Section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorize the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program (MRP), Attachment E of this Order, establishes monitoring and reporting requirements to implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the MRP for this facility.

A. Influent Monitoring

1. Influent monitoring is required to collect data on the characteristics of the wastewater and to assess compliance with effluent limitations (*e.g.*, BOD and TSS reduction requirements) and to assess the effectiveness of the Discharger's pretreatment program.

B. Effluent Monitoring

1. Pursuant to the requirements of 40 CFR §122.44(i)(2) effluent monitoring is required for all constituents with effluent limitations. Effluent monitoring is necessary to assess compliance with effluent limitations, assess the effectiveness of the treatment process, and to assess the impacts of the discharge on the receiving water.

2. The SIP states that if "…*all reported detection limits of the pollutant in the effluent are greater than or equal to the C* [water quality criterion or objective] *value, the RWQCB* [Regional Water Board] *shall establish interim requirements…that require additional monitoring for the pollutant….*" All reported detection limits for some of the priority pollutants are greater than or equal to corresponding applicable water quality criteria or objectives. Monitoring for these constituents has been included in this Order in accordance with the SIP.

3. During this permit period, the Facility will be upgraded to discharge 4.8 mgd of tertiary-level treated effluent year-round in addition to the seasonal discharge of secondary-level treated effluent limited by 20:1 (river:effluent) dilution requirement. Therefore, two additional effluent monitoring locations, EFF-001B and EFF-001C, are established in this permit. Monitoring location EFF-001B is necessary to demonstrate compliance with DHS reclamation criteria (CCR Title 22, Division 4, Chapter 3, or equivalent) and Section IV.A.2 of this Order. EFF-001C is necessary to demonstrate that the combined discharge of secondary- and tertiary-level treated effluent complies with Section IV.A.1 of this Order.

C. Whole Effluent Toxicity Testing Requirements

1. **Acute Toxicity.** Weekly 96-hour bioassay testing is required to demonstrate compliance with the effluent limitation for acute toxicity.

2. **Chronic Toxicity.** Quarterly chronic whole effluent toxicity testing is required in order to demonstrate compliance with the Basin Plan's narrative toxicity objective.

D. Receiving Water Monitoring

1. **Surface Water.**

   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

1. **Water Supply Monitoring.** Water supply monitoring is required to evaluate the source of constituents in the wastewater.

VII. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with section 122.41, and additional conditions applicable to specified categories of permits in accordance with 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.

Section 122.41(a)(1) and (b) through (n) establish conditions that apply to all State-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. Section 123.25(a)(12) allows the state to omit or modify conditions to impose more stringent requirements. In accordance with section 123.25, this Order omits federal conditions that address enforcement authority specified in 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. **Special Provisions VI.C.1.a. & b.** These provisions are based on CFR Part 123 and allow future modification of this Order and its effluent limitations as necessary in response to updated WQOs that may be established in the future.

b. **Mercury.** This provision allows the Regional Water Board to reopen this Order in the event mercury a TMDL program is adopted. In addition, this Order shall be reopened if the Regional Water Board determines that a mercury offset program is feasible for dischargers subject to a NPDES permits.

c. **Whole Effluent Toxicity.** This Order requires the Discharger to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity through a Toxicity Reduction Evaluation (TRE). Accordingly, this Order may be reopened to include a chronic toxicity limitation, a new acute toxicity limitation, and/or a limitation for a specific toxicant identified in the TRE. Additionally, if 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.

d. **Water Effects Ratios (WER) and Metal Translators.** A default WER of 1.0 has been used in this Order for calculating water quality criteria for applicable inorganic constituents. This Order allows the Discharger to perform studies to determine site-specific WERs and/or dissolved-to-total metal translators. Accordingly, this provision allows the Regional Water Board to reopen this Order to modify the applicable effluent limitations in the event that the Discharger conducts and completes these studies, or based upon an independent scientific peer review's defensible findings that update the national ambient water quality criteria for aluminum.

e. **Mixing Zone Study.** . Section 1.4.2 of the SIP allows the Regional Water Board to grant dilution credit when the Discharger has demonstrated through studies to the Regional Water Board that the credit is appropriate. This Order allows the Discharger to perform receiving water mixing zone studies to evaluate any available assimilative capacity in SJR and the associated tributary channel (or side-channel). Accordingly, this provision allows the Regional Water Board to reopen this Order to modify the applicable effluent limitations in the event that the Discharger demonstrates to the satisfaction of the Regional Water Board that a dilution credit is appropriate.

f. **Ammonia Site-specific Objective Study.** The final daily maximum effluent limitations for ammonia are calculated based on worst case conditions (maximum effluent pH of 8.5), which may be highly conservative because past effluent pH monitoring values rarely exceed 8.0 standard units. The Regional Water Board has recently adopted permits that had ammonia limitations based on the 1/10th

percentile (which is consistent with the 1-in-3 year average frequency for criteria excursions recommended by the USEPA) downstream river pH values instead of the maximum effluent pH value of 8.5. Therefore, this Order allows the Discharger to conduct site specific studies to determine an ammonia water quality objective based on site-specific conditions as allowed by the SIP.

g. **Salinity (as Electrical Conductivity).** This provision allows the Regional Water Board to reopen this Order to modify the applicable effluent limitations based on new information provided by the TMDL program.

2. Special Studies, Technical Reports, and Additional Monitoring Requirements

a. **Chronic Whole Effluent Toxicity Requirements.** The Basin Plan contains a narrative toxicity objective that states, "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life." (Basin Plan at III-8.00.) Adequate WET data is not available to determine if the discharge has reasonable potential to cause or contribute to an in-stream excursion above of the Basin Plan's narrative toxicity objective. Attachment E of this Order requires Quarterly chronic WET monitoring for demonstration of compliance with the narrative toxicity objective.

In addition to WET monitoring, this provision requires the Discharger to submit to the Regional Water Board an Initial Investigative TRE Work Plan for approval by the Executive Officer, to ensure the Discharger has a plan to immediately move forward with the initial tiers of a TRE, in the event effluent toxicity is encountered in the future. The provision also includes a numeric toxicity monitoring trigger and requirements for accelerated monitoring, as well as, requirements for TRE initiation if a pattern of toxicity is demonstrated.

Monitoring Trigger. A numeric toxicity monitoring trigger of > 1 TUc (where TUc = 100/NOEC) is applied in the provision, because this Order does not allow any dilution for the chronic condition. Therefore, a TRE is triggered when the effluent exhibits a pattern of toxicity at 100% effluent. If the Discharger performs a mixing zone/dilution study and the permit is reopened to allow dilution credits for acute and/or chronic aquatic life criteria, in accordance with Sections VI.C.3.f. and VI.C.3.g. of this Order, the numeric monitoring trigger may be adjusted accordingly.

Accelerated Monitoring. The provision requires accelerated WET testing when a regular WET test result exceeds the monitoring trigger. The purpose of accelerated monitoring is to determine, in an expedient manner, whether there is a pattern of toxicity before requiring the implementation of a TRE. Due to possible seasonality of the toxicity, the accelerated monitoring should be performed in a timely manner, preferably taking no more than 2 to 3 months to complete.

The provision requires accelerated monitoring consisting of four chronic toxicity tests every two weeks using the species that exhibited toxicity. Guidance regarding accelerated monitoring and TRE initiation is provided in the *Technical Support Document for Water Quality-based Toxics Control, EPA/505/2-90-001, March 1991* (TSD). The TSD at page 118 states, "EPA recommends if toxicity is repeatedly or periodically present at levels above effluent limits more than 20 percent of the time, a TRE should be required." Therefore, four accelerated monitoring tests are required in this provision. If no toxicity is demonstrated in the four accelerated tests, then it demonstrates that toxicity is not present at levels above the monitoring trigger more than 20 percent of the time (only 1 of 5 tests are toxic, including the initial test). However, notwithstanding the accelerated monitoring results, if there is adequate evidence of a pattern of effluent toxicity (i.e. toxicity present exceeding the monitoring trigger more than 20 percent of the time), the Executive Officer may require that the Discharger initiate a TRE.

See the WET Accelerated Monitoring Flow Chart (Figure F-1), below, for further clarification of the accelerated monitoring requirements and for the decision points for determining the need for TRE initiation.

TRE Guidance. The Discharger is required to prepare a TRE Work Plan in accordance with USEPA guidance. Numerous guidance documents are available, as identified below:

- *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants,* (EPA/833B-99/002), August 1999.

- Generalized Methodology for Conducting Industrial TREs*, (EPA/600/2-88/070), April 1989.*

- *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures,* Second Edition, EPA 600/6-91/005F, February 1991.

- *Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I*, EPA 600/6-91/005F, May 1992.

- *Methods for Aquatic Toxicity Identification Evaluations: Phase II Toxicity Identification Procedures for Samples Exhibiting acute and Chronic Toxicity,* Second Edition, EPA 600/R-92/080, September 1993.

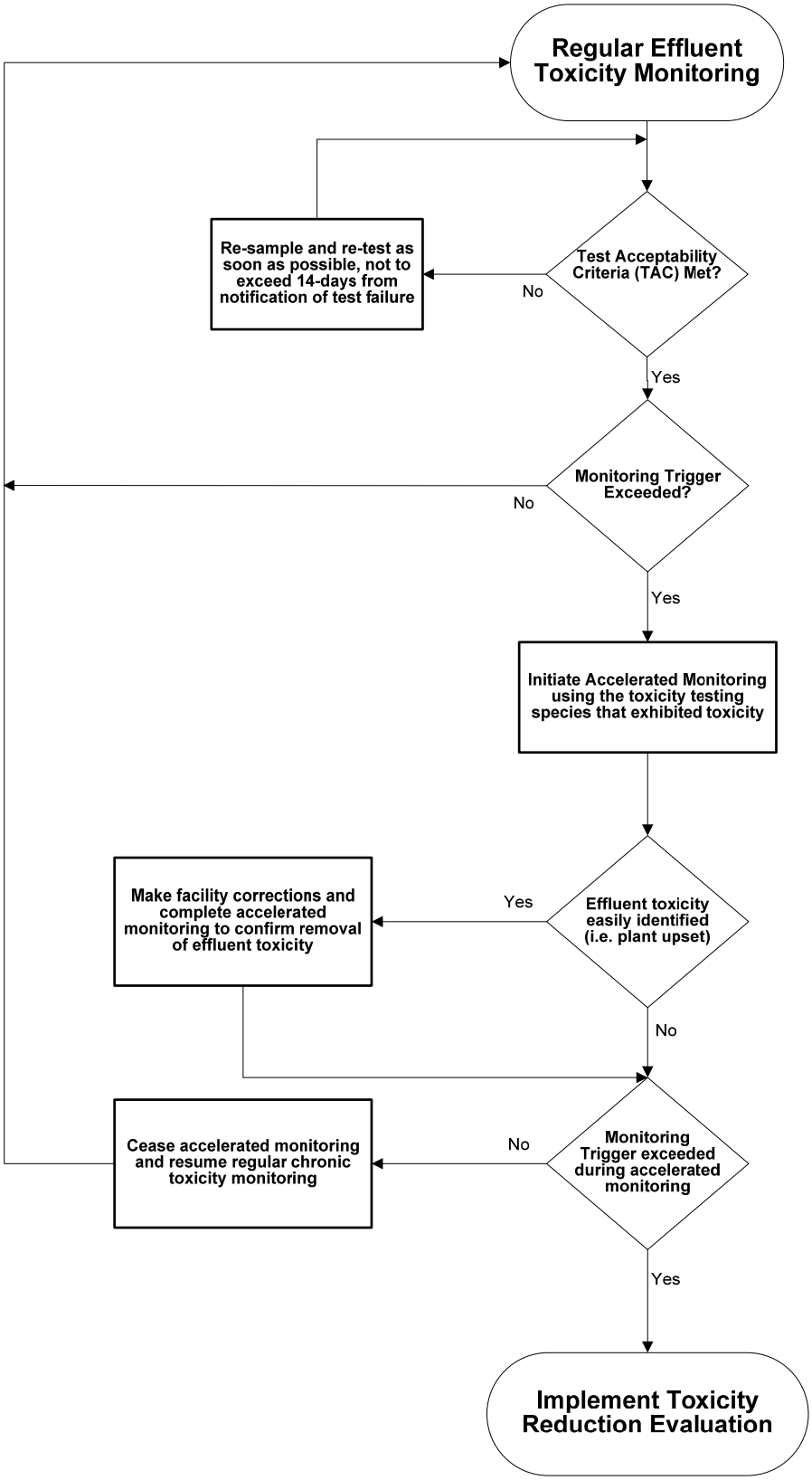
- *Methods for Aquatic Toxicity Identification Evaluations: Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity*, Second Edition, EPA 600/R-92/081, September 1993.

- *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, Fifth Edition, EPA-821-R-02-012, October 2002.

- *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, EPA-821-R-02-013, October 2002.

- *Technical Support Document for Water Quality-based Toxics Control, EPA/505/2-90-001, March 1991*

Figure F-1
WET Accelerated Monitoring Flow Chart



3. Best Management Practices and Pollution Prevention

a. **Salinity Reduction.** This provision requires the Discharger to provide annual reports demonstrating reasonable progress in the reduction of salinity in its discharge to the SJR, and is based on the Salinity Policy of the Sacramento-San Joaquin Rivers Basin Plan.

4. Construction, Operation, and Maintenance Specifications – Not Applicable

5. Special Provisions for Municipal Facilities (POTWs Only)

a. **Pretreatment Requirements.**

i. The Federal Clean Water Act, Section 307(b), and Federal Regulations, 40 CFR Part 403, require publicly owned treatment works to develop an acceptable industrial pretreatment program. A pretreatment program is required to prevent the introduction of pollutants, which will interfere with treatment plant operations or sludge disposal, and prevent pass through of pollutants that exceed water quality objectives, standards or permit limitations. Pretreatment requirements are imposed pursuant to 40 CFR Part 403.

ii. The Discharger shall implement and enforce its approved pretreatment program and is an enforceable condition of this Order. If the Discharger fails to perform the pretreatment functions, the Regional Water Board, the State Water Board or the U.S. EPA may take enforcement actions against the Discharger as authorized by the CWA.

b. **Collection System.** The Discharger's collection system is part of the treatment system that is subject to the Order 2006-0003, adopted by the State Water Board on May 2006. This Order is a Statewide General WDR for Sanitary Sewer Systems. Therefore, the Discharger shall be subject to the requirements of Order 2006-0003 and any future revisions thereto. Pursuant to federal regulations, the Discharger must properly operate and maintain its collection system [CFR Part 122.41(e)], report any non-compliance [CFR parts 122.41(l)(6) and (7)], and mitigate any discharge from the collection system in violation of this Order [CFR Part 122.41(d)].

6. Other Special Provisions

a. **Tertiary Treatment of Year-round 4.8 Discharge.** To protect public health and safety, the Discharger is to comply with DHS reclamation criteria, CCR Title 22, Division 4, Chapter 3, or equivalent.

b. **Ownership Change.** To maintain the accountability of the operation of the Facility, the Discharger is required to notify the succeeding owner or operator of the existence of this Order by letter if, and when, there is any change in control or

ownership of land or waste discharge facilities presently owned or controlled by the Discharger.

7. Compliance Schedules

a. **Tertiary-level Treated Discharge, Phase 1A and Phase 1B.** The Discharger has requested a total expansion of allowable flows to be discharged up to 4.8 mgd year round to SJR. These provisions are necessary to comply with the Antidegradation Policy; thus, the Discharger must comply with each provision before the permitted flow may be increased in each applicable phase.

b. **Ammonia, Dichlorobromomethane, and Chlorodibromomethane.** The use and location of compliances schedules in the permit depends on the Discharger's ability to comply and the source of the applied water quality criteria. On 25 March 2008, the Discharger submitted a request, and justification for compliance schedules for ammonia, dichlorobromomethane, and chlorodibromomethane. On 1 September 2009, the Discharger submitted an updated compliance schedule justification for ammonia. The compliance schedule justification included all items specified in Paragraph 3, items (a) through (d), of Section 2.1 of the SIP. This Order establishes a compliance schedule for the new, final, water quality-based effluent limitations for ammonia, dichlorobromomethane, and chlorodibromomethane. Full compliance is required no later than 18 May 2010 for dichlorobromomethane and chlorodibromomethane; and no later than **1 February 2016** for ammonia. Based on influent data provided by the Discharger, it is evident that chlorodibromomethane and dichlorobromomethane are not present in the influent. These constituents are chlorinated byproducts and are likely formed in the chlorination process. Therefore, pollution prevention plans are not necessary and are not included as a requirement of the compliance schedules. Furthermore, ammonia is a normal constituent in municipal wastewater and pollution prevention measures are not effective. Therefore, a pollution prevention plan is not required for ammonia.

c. **Compliance Schedule for Final Effluent Limitations for Electrical Conductivity.** The Discharger shall comply with a time schedule to ensure compliance with the final effluent limitations for Electrical Conductivity, in accordance with the Salinity and Boron TMDL. Final compliance is required by 28 July 2022, for wet through dry years and 28 July 2026 for critical years. Since the reduction in effluent salinity is a complex issue that may require the development of new lower salinity water supplies or other long-term solutions, the compliance schedule of 16-20 years is reasonable and necessary. Consistent with the Regional Water Board's recommendations, this Order requires the Discharger to develop and implement a salinity source control program that will identify and implement measures to reduce salinity in the discharge to the SJR, and to participate financially in the development of the Central Valley Salinity Management Plan at a level commensurate with its contributions of salinity to the SJR. This Order contains interim performance

based effluent limitations for EC, and an EC goal based on the weighted average of the Discharger's water supply plus an increment of 500 μS/cm.

VIII. PUBLIC PARTICIPATION

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

A. Notification of Interested Parties

The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Notification was provided through the Modesto Bee.

B. Written Comments

The staff determinations are tentative. Interested persons are invited to submit written comments concerning these tentative WDRs. Comments must be submitted either in person or by mail to the Executive Office at the Regional Water Board at the address above on the cover page of this Order.

To be fully responded to by staff and considered by the Regional Water Board, written comments should be received at the Regional Water Board offices by 5:00 p.m. on 25 March 2008.

C. Public Hearing

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

Date: **24/25 April 2008**
Time: 8:30 am
Location: Regional Water Quality Control Board, Central Valley Region
11020 Sun Center Dr., Suite #200
Rancho Cordova, CA 95670

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

Please be aware that dates and venues may change. Our Web address is http://www.waterboards.ca.gov/rwqcb5/ where you can access the current agenda for changes in dates and locations.

D. Waste Discharge Requirements Petitions

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

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

E. Information and Copying

The Report of Waste Discharge (RWD), related documents, tentative effluent limitations and special provisions, comments received, and other information are on file and may be inspected at the address above at any time between 8:30 a.m. and 4:45 p.m., Monday through Friday. Copying of documents may be arranged through the Regional Water Board by calling Ms. Gayleen Perreira at (916) 464-4824 or Mr. James Marshall at (916) 464-4772.
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F. Register of Interested Persons

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

G. Additional Information

Requests for additional information or questions regarding this order should be directed to Ms. Gayleen Perreira at (916) 464-4824.

ATTACHMENT G – REASONABLE POTENTIAL ANALYSIS

INORGANIC CONSTITUENTS

Constituent	CAS Number	CTR #	MEC	B	C	CMC	CCC	Human Health Criteria Water & Org	Human Health Criteria Org. Only	Basin Plan	MCL	Reasonable Potential?
Aluminum	7429905		**210.00**	**2900.00**	87	750.0 (1)	87.0 (1)				200	**Yes, MEC & B > C**
Antimony	7440360	1	**0.60**	**0.30**	6			14	4300		6	**No**
Arsenic	7440382	2	**5.00**	**5.80**	10	340.0	150.0			10	50	**No**
Asbestos	1332214	15	**0.94 (3)**	**2.79 (3)**	7.00 (3)						7.0 (2)	**No**
Barium	7440393		**46.00**	**100.00**	1000						1000	**No**
Beryllium	7440417	3	**< 0.06**	**0.07**	4						4	**No**
Cadmium	7440439	4	**0.40**	**0.10J**	2.99	5.03 (4)	2.99 (2)				5	**No**
Chromium (III)					105.49	2207.1 (2)	105.5 (2)					**No**
Chromium (VI)	18540299	5b	**2.60**	**0.70**	11	16.0	11.0					**No**
Chromium (total)	7440473	5a	**1.90**	**6.80**	50						50	**No**
Copper	7440508	6	**11.00**	**11.00**	11.52	17.66 (2)	11.52 (2)				1300	**No**
Cyanide	57125	14	**4.00**	**1.30**	5.2	22.0	5.2			10	200	**No**
Fluoride	7782414		**0.30**	**0.50**	2000						2000	**No**
Iron	7439896		**360.00**	**4.40**	300					300	300	**Yes, MEC > C**
Lead	7439921	7	**0.56**	**1.60**	2.50	64.07 (4)	2.50 (4)				15	**No**
Manganese	7439965		**30.00**	**640.00**	50					N/A	50	**Yes, B > C**
Mercury	7439976	8	**0.0190**	**0.0180**	0.05			0.05	0.051		2	**No**
Nickel	7440020	9	**7.10**	**10.00**	64.2780114	578.1 (2)	64.3 (2)				100	**No**
Selenium	7782492	10	**6.00**	**6.00**	5	20.0	5.0			5	50	**Yes, MEC & B > C**
Silver	7440224	11	**0.10**	**< 0.00**	5.80461688	5.8 (2)				10	100	**No**
Thallium	7440280	12	**0.10**	**0.20J**	2						2	**No**
Tributyltin	688733		**0.0121**	**< 0.001**	0.072	0.42	0.072					**No**
Zinc	7440666	13	**20.00**	**16.00**	100	147.7 (2)	147.7 (2)			100	5000	**No**
Molybdenum			**21**	**7.6**	10					10	10	**Yes, MEC > C**

General Notes:

All units µg/L unless otherwise noted.
B = Maximum Receiving Water Concentration
MEC = Projected Maximum Effluent Concentration (calculated using Table 3-1, TSD, for non-CTR, equals maximum observed effluent concentration for CTR)
C = Criteria (Used for reasonable potential analysis)
CMC = Criterion Maximum Concentration (CTR criteria unless otherwise noted)
CCC = Criterion Contiuous Concentration (CTR criteria unless otherwise noted)
MCL = Drinking Water Standards Maximum Contaminant Levels
Basin Plan = Numeric Site-specific Basin Plan Objective
(1) USEPA National Recommended Ambient Water Quality Criteria
(2) Calculated using an effluent hardness of 130 mg/L as CaCO3.
(3) Units in million fibers per liter (mfl)
(4) Calculated using an effluent hardness of 130 mg/L as CaCO3 and Receiving Water hardness of 4
(5) Calculated using an effluent hardness of 130 mg/L as CaCO3 and Receiving Water hardness of 8

SEMI-VOLATILE ORGANIC CONSTITUENTS

Constituent	CAS Number	CTR #	MEC	B	C	CMC	CCC	Human Health Criteria Water & Org	Human Health Criteria Org. Only	Basin Plan	MCL	Reasonable Potential?
1,2-Benzanthracene	56553	60	< 0.02	< 0.12	0.0044			0.0044	0.049			Inconclusive
1,2-Diphenylhydrazine	122667	85	< 0.30	< 0.30	0.04			0.04	0.54			Inconclusive
2-Chlorophenol	95578	45	< 0.40	< 0.40	120			120	400			No
2,4-Dichlorophenol	120832	46	< 0.30	< 0.30	93			93	790			No
2,4-Dimethylphenol	105679	47	< 0.30	< 0.30	540			540	2300			No
2,4-Dinitrophenol	51285	49	< 0.30	< 0.30	70			70	14000			No
2,4-Dinitrotoluene	121142	82	< 0.30	< 0.30	0.11			0.11	9.1			Inconclusive
2,4,6-Trichlorophenol	88062	55	0.30	< 0.20	2.1			2.1	6.5			No
2,6-Dinitrotoluene	606202	83	< 0.30	< 0.30								No
2-Nitrophenol	25154557	50	< 0.30	< 0.20								No
2-Chloronaphthalene	91587	71	< 0.30	< 0.30	1700			1700	4300			No
3,3'-Dichlorobenzidine	91941	78	< 0.30	< 0.30	0.04			0.04	0.077			Inconclusive
3,4-Benzofluoranthene	205992	62	< 0.03	< 0.11	0.0044			0.0044	0.049			Inconclusive
4-Chloro-3-methylphenol	59507	52	< 0.30	< 0.30								No
4,6-Dinitro-2-methylphenol	534521	48	< 0.40	< 0.40	13.4			13.4	765			No
4-Nitrophenol	100027	51	0.90	< 0.20								No
4-Bromophenyl phenyl ether	101553	69	< 0.40	< 0.40								No
4-Chlorophenyl phenyl ether	7005723	72	< 0.40	< 0.40								No
Acenaphthene	83329	56	< 0.03	< 0.17	1200			1200	2700			No
Acenaphthylene	208968	57	< 0.02	< 0.03								No
Anthracene	120127	58	< 0.03	< 0.16	9600			9600	110000			No
Benzidine	92875	59	< 0.30	< 0.30	0.00012			0.00012	0.00054			Inconclusive
Benzo(a)pyrene (3,4-Benzopyrene)	50328	61	< 0.02	< 0.09	0.0044			0.0044	0.049			Inconclusive
Benzo(g,h,i)perylene	191242	63	< 0.03	< 0.06								No
Benzo(k)fluoranthene	207089	64	< 0.04	< 0.16	0.0044			0.0044	0.049			Inconclusive
Bis(2-chloroethoxy) methane	111911	65	< 0.30	< 0.30								No
Bis(2-chloroethyl) ether	111444	66	< 0.30	< 0.30	0.031			0.031	1.4			Inconclusive
Bis(2-chloroisopropyl) ether	39638329	67	< 0.60	< 0.60	1400			1400	170000			No
Bis(2-ethylhexyl) phthalate	117817	68	0.90	0.80	1.8			1.8	5.9		4	No
Butyl benzyl phthalate	85687	70	< 0.40	< 0.40	3000			3000	5200			No
Chrysene	218019	73	< 0.04	< 0.14	0.0044			0.0044	0.049			Inconclusive
Di-n-butylphthalate	84742	81	2.00	< 0.40	2700			2700	12000			No
Di-n-octylphthalate	117840	84	< 0.40	< 0.40								No
Dibenzo(a,h)-anthracene	53703	74	< 0.03	< 0.04	0.0044			0.0044	0.049			Inconclusive
Diethyl phthalate	84662	79	8.00	< 0.40	23000			23000	120000			No
Dimethyl phthalate	131113	80	< 0.40	< 0.40	313000			313000	2900000			No
Fluoranthene	206440	86	< 0.03	< 0.03	300			300	370			No
Fluorene	86737	87	< 0.02	< 0.02	1300			1300	14000			No
Hexachlorocyclopentadiene	77474	90	< 0.10	< 0.10	240			240	17000			No
Indeno(1,2,3-c,d)pyrene	193395	92	< 0.03	< 0.04	0.0044			0.0044	0.049			Inconclusive
Isophorone	78591	93	< 0.30	< 0.30	8.4			8.4	600			No
N-Nitrosodiphenylamine	86306	98	< 0.40	< 0.40								No
N-Nitrosodimethylamine	62759	96	< 0.40	< 0.40	0.00069			0.00069	8.1			Inconclusive
N-Nitrosodi-n-propylamine	621647	97	< 0.30	< 0.30	0.005			0.005	1.4			Inconclusive
Nitrobenzene	98953	95	< 0.30	< 0.30	17			17	1900			No
Pentachlorophenol	87865	53	< 0.02	< 0.02	0.28	19	15	0.28	8.2			No
Phenanthrene	85018	99	< 0.03	< 0.03								No
Phenol	108952	54	0.60	< 0.20	21000			21000	4600000			No
Pyrene	129000	100	< 0.03	< 0.03	960			960	11000			No

General Notes:
All units µg/L unless otherwise noted.
MEC = Projected Maximum Effluent Concentration (calculated using Table 3-1, TSD,

CCC = Criterion Contiuous Concentration (CTR criteria unless otherwise noted)
MCL = Drinking Water Standards Maximum Contaminant Levels

VOLATILE ORGANIC CONSTITUENTS

Constituent	CAS Number	CTR #	MEC	B	C	CMC	CCC	Human Health Criteria Water & Org	Human Health Criteria Org. Only	Basin Plan	MCL	Reasonable Potential?
1,1-Dichloroethane	75343	28	< 0.05	< 0.28	5						5	No
1,1-Dichloroethene	75354	30	< 0.06	< 0.37	0.057			0.057	3.2			Inconclusive
1,1,1-Trichloroethane	71556	41	< 0.06	< 0.35	200						200	No
1,1,2-Trichloroethane	79005	42	< 0.07	< 0.27	0.6			0.6	42			No
1,1,2,2-Tetrachloroethane	79345	37	< 0.06	< 0.30	0.17			0.17	11			Inconclusive
1,2-Dichlorobenzene	95501	75	< 0.05	< 0.12	2700			2700	17000			No
1,2-Dichloroethane	107062	29	< 0.06	< 0.18	0.38			0.38	99			No
cis-1,2-Dichloroethene	156592		< 0.05	< 0.30	6						6	No
1,2-Dichloropropane	78875	31	< 0.05	< 0.20	0.52			0.52	39			No
1,2,4-Trichlorobenzene	120821	101	< 0.05	< 0.26	70			260	940		70	No
1,3-Dichlorobenzene	541731	76	< 0.07	< 0.16	400			400	2600			No
1,3-Dichloropropylene	542756	32	< 0.06	< 0.22	3100			3100	29000			No
1,4-Dichlorobenzene	106467	77	< 0.06	< 0.12	5			400	2600		5	No
Acrolein	107028	17	4.00	< 1.00	320			320	780			No
Acrylonitrile	107131	18	< 0.33	< 1.00	0.059			0.059	0.66			Inconclusive
Benzene	71432	19	< 0.06	< 0.27	1			1.2	71		1	No
Bromoform	75252	20	1.80	< 0.10	4.3			4.3	360			No
Bromomethane	74839	34	< 0.05	< 0.42	48			48	4000			No
Carbon tetrachloride	56235	21	2.20	< 0.42	0.25			0.25	4.4			Yes, MEC > C
hlorobenzene (mono chlorobenzene)	108907	22	< 0.06	< 0.19	680			680	21000			No
Chloroethane	75003	24	1.10	0.30 J								No
2- Chloroethyl vinyl ether	110758	25	< 0.10	< 0.31								No
Chloroform	67663	26	21.00	0.60	80						80.0	No
Chloromethane	74873	35	< 0.04	< 0.36								No
Dibromochloromethane	124481	23	16.00	< 0.18	0.41			0.41	34			Yes, MEC > C
Bromodichloromethane	75274	27	27.00	0.20 J	0.56			0.56	46			Yes, MEC > C
Dichloromethane	75092	36	0.40	0.20	4.7			4.7	1600			No
Ethylbenzene	100414	33	< 0.06	< 0.30	3100			3100	29000			No
Hexachlorobenzene	118741	88	< 0.40	< 0.40	0.00075			0.00075	0.00077			Inconclusive
Hexachlorobutadiene	87683	89	< 0.20	< 0.20	0.44			0.44	50			No
Hexachloroethane	67721	91	< 0.20	< 0.20	1.9			1.9	8.9			No
Naphthalene	91203	94	< 0.02	< 0.05								No
Tetrachloroethene	127184	38	< 0.06	< 0.32	0.8			0.8	8.85			No
Toluene	108883	39	0.60	< 0.25	6800			6800	200000			No
trans-1,2-Dichloroethylene	156605	40	< 0.05	< 0.24	700			700	140000			No
Trichloroethene	79016	43	0.10	0.23 J	2.7			2.7	81			No
Vinyl chloride	75014	44	< 0.05	< 0.34	2			2	525			No
Methyl-tert-butyl ether (MTBE)	1634044		< 0.06	< 0.19	5						5	No
Trichlorofluoromethane	75694		0.10	< 0.41								No
1,1,2-Trichloro-1,2,2-Trifluoroethane	76131		< 0.30	< 0.30								No
Styrene	100425		< 0.06	< 0.25								No
Xylenes	1330207		< 0.13	< 0.40								No

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B = Maximum Receiving Water Concentration

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CMC = Criterion Maximum Concentration (CTR criteria unless otherwise noted)

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Basin Plan = Numeric Site-specific Basin Plan Objective

PESTICIDES - PCBs

Constituent	CAS Number	CTR #	MEC	B	C	CMC	CCC	Human Health Criteria Water & Org	Human Health Criteria Org. Only	Basin Plan	MCL	Reasonable Potential?
4,4'-DDD	72548	110	**< 0.001**	**< 0.001**	0.00083			0.00083	0.00084			**Inconclusive**
4,4'-DDE	72559	109	**< 0.001**	**< 0.001**	0.00059			0.00059	0.00059			**Inconclusive**
4,4'-DDT	50293	108	**< 0.001**	**< 0.001**	0.00059	1.1	0.001	0.00059	0.00059			**Inconclusive**
alpha-Endosulfan	959988	112	**< 0.002**	**< 0.002**	0.0087	0.22	0.056	0.0087	110			**No**
alpha-Hexachlorocyclohexane (BHC)	319846	103	**< 0.002**	**< 0.002**	0.0039			0.0039	0.013			**No**
Alachlor	15972608		**< 0.3**	**< 0.3**								**No**
Aldrin	309002	102	**< 0.003**	**< 0.003**	0.00013	3		0.00013	0.00014			**Inconclusive**
beta-Endosulfan	33213659	113	**< 0.001**	**< 0.001**	0.056	0.22	0.056	110	240			**No**
beta-Hexachlorocyclohexane	319857	104	**< 0.001**	**< 0.001**	0.014			0.014	0.046			**No**
Chlordane	57749	107	**< 0.0031**	**< 0.005**	0.00057	2.4	0.0043	0.00057	0.00059			**Inconclusive**
delta-Hexachlorocyclohexane	319868	106	**< 0.001**	**< 0.001**								**No**
Dieldrin	60571	111	**< 0.002**	**< 0.002**	0.00014	0.24	0.056	0.00014	0.00014			**Inconclusive**
Endosulfan sulfate	1031078	114	**< 0.001**	**< 0.001**	110			110	240			**No**
Endrin	72208	115	**< 0.002**	**< 0.002**	0.036	0.086	0.036	0.76	0.81			**No**
Endrin Aldehyde	7421934	116	**< 0.002**	**< 0.002**	0.76			0.76	0.81			**No**
Heptachlor	76448	117	**< 0.003**	**< 0.003**	0.00021	0.52	0.0038	0.00021	0.00021			**Inconclusive**
Heptachlor Epoxide	1024573	118	**< 0.002**	**< 0.002**	0.0001	0.52	0.0038	0.0001	0.00011			**Inconclusive**
Lindane (gamma-BHC)	58899	105	**< 0.001**	**< 0.001**	0.019	0.95		0.019	0.063			**No**
PCB-1016	12674112	119	**< 0.0031**	**< 0.05**	0.00017			0.00017	0.00017			**Inconclusive**
PCB-1221	11104282	120	**< 0.03**	**< 0.03**	0.0002	0.73	0.0002	0.00073	0.00075			**Inconclusive**
PCB-1232	11141165	121	**< 0.04**	**< 0.04**	0.0002	0.73	0.0002	0.00073	0.00075			**Inconclusive**
PCB-1242	53469219	122	**< 0.042**	**< 0.05**	0.0002	0.73	0.0002	0.00073	0.00075			**Inconclusive**
PCB-1248	12672296	123	**< 0.05**	**< 0.05**	0.0002	0.73	0.0002	0.00073	0.00075			**Inconclusive**
PCB-1254	11097691	124	**< 0.063**	**< 0.07**	0.0002	0.73	0.0002	0.00073	0.00075			**Inconclusive**
PCB-1260	11096825	125	**< 0.05**	**< 0.05**	0.0002	0.73	0.0002	0.00073	0.00075			**Inconclusive**
Toxaphene	8001352	126	**< 0.2**	**< 0.2**	0.0002	0.73	0.0002	0.00073	0.00075			**Inconclusive**
Atrazine	1912249		**< 0.02**	**< 0.02**	1						1	**No**
Bentazon	25057890		**< 0.84**	**< 0.84**	18						18	**No**
Carbofuran	1563662		**2.4**	**< 1.3**	18						18	**No**
2,4-D	94757		**< 5.30**	**< 5.30**	70						70	**No**
Dalapon	75990		**5.74**	**< 1.6**	200						200	**No**
1,2-Dibromo-3-chloropropane (DBCP)	96128		**< 0.007**	**< 0.007**	0.2						0.2	**No**
Di(2-ethylhexyl)adipate	103231		**< 0.51**	**< 0.51**	400						400	**No**
Dinoseb	88857		**0.62**	**< 0.49**	7						7	**No**
Diquat	85007		**< 0.8**	**< 0.8**	20						20	**No**
Endothal	145733		**< 19**	**< 19**	100						100	**No**
Ethylene Dibromide	106934		**< 0.004**	**< 0.004**	0.05						0.05	**No**
Glyphosate	1071836		**6**	**< 4.6**	700						700	**No**
Methoxychlor	72435		**< 0.002**	**< 0.002**	0.03	0.03					30	**No**
Molinate (Ordram)	2212671		**< 0.03**	**< 0.03**	13	13					20	**No**
Oxamyl	23135220		**3.87**	**< 2.6**	50						50	**No**
Picloram	1918021		**0.75**	**< 0.27**	500						500	**No**
Simazine (Princep)	122349		**< 0.02**	**< 0.02**	4	10					4	**No**
Thiobencarb	28249776		**< 0.02**	**< 0.02**	1	3.1					1	**No**
2,3,7,8-TCDD (Dioxin)	1746016	16	**< 0.000000699**	**< ND**	1.3E-08			1.3E-08	1.4E-08			**Inconclusive**
2,4,5-TP (Silvex)	93765		**0.43**	**< 0.42**	10			10			50	**No**
Diazinon	333415		**< 0.02**	**< 0.02**	0.05	0.080 (1)	0.050 (1)					**No**
Chlorpyrifos	2921882		**< 0.028**	**< 0.12**	0.014	0.020 (1)	0.014 (1)					**Inconclusive**

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OTHER CONSTITUENTS

Constituent	CAS Number	CTR #	MEC	B	C	CMC	CCC	Human Health Criteria Water & Org	Human Health Criteria Org. Only	Basin Plan	MCL	Reasonable Potential?
Ammonia (as N)	7664417		**27.2 (1)**	**2.680 (1)**	1.15 (1)	2.14 (1,2)	1.15 (1,2)					**Yes, MEC & B > C**
Chloride	16887006		**210 (1)**	**270 (1)**	230 (1,2)	860 (1,2)	230 (1,2)				250 (1)	**Yes, B > C**
Foaming Agents (MBAS)			**0.58**	**0.21**	500						500	**No**
Nitrate (as N)	14797558		**11.01 (1)**	**5.40 (1)**	10 (1)						10 (1)	**Yes, MEC > C**
Nitrite (as N)	14797650		**4.19 (1)**	**0.37 (1)**	1 (1)						1 (1)	**Yes, MEC > C**
Phosphorus, Total (as P)	7723140		**3.36 (1)**	**0.829 (1)**								**No**
Specific conductance (EC)			**1715 (3)**	**2320 (3)**	900 (3)						900 (3)	**Yes, MEC & B > C**
Sulfide (as S)			**< 0.03**	**< 0.03**								**No**
Sulfite (as SO_3)			**2.8**	**< 0.073**								**No**

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(1) Units in mg/L

(2) USEPA Ambient Water Quality Criteria

(3) Units in umhos/cm

Acute Design pH =	8.5	
Chronic Design pH =	8	
Design Temperature =	26.2	deg. C
Salmonids Present?	yes	
ELS Present?	yes	