CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

CENTRAL VALLEY REGION

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ORDER NO. R5-2010-XXXX
NPDES NO. CA0083771

WASTE DISCHARGE REQUIREMENTS FOR THE CITY OF RIO VISTA NORTHWEST WASTEWATER TREATMENT FACILITY SOLANO COUNTY

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

Table 1. Discharger Information

Discharger	**City of Rio Vista**
Name of Facility	**Northwest Wastewater Treatment Facility**
Facility Address	**3000 Airport Road**
	Rio Vista, CA 94571
	Solano 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 RIO VISTA** 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	**Tertiary treated municipal effluent**	**38 º 10' 6" N**	**121 º 40' 42" W**	**Sacramento River**

Table 3. Administrative Information

This Order was adopted by the Regional Water Quality Control Board on:	**<Adoption Date>**
This Order shall become effective on:	**<Effective Date>**
This Order shall expire on:	**<Expiration Date>**
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>**

I, Pamela 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 XX July 2010.

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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 Rio Vista
Name of Facility	Northwest Wastewater Treatment Facility
Facility Address	3000 Airport Road
	Rio Vista, CA 94571
	Solano County
Facility Contact, Title, and Phone	Public Works Director/City Manager, (707) 374-6747
Mailing Address	Same as Facility Address
Type of Facility	Publicly Owned Treatment Works
Facility Design Flow	1.0 million gallons per day (mgd) Average Dry Weather Flow (ADWF)

II. FINDINGS

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

A. Background. City of Rio Vista (hereinafter Discharger) is currently discharging pursuant to Order No. R5-2004-0092 and National Pollutant Discharge Elimination System (NPDES) Permit No. CA0083771. The Discharger submitted a Report of Waste Discharge, dated 16 March 2009, and applied for a NPDES permit renewal to discharge up to 1.0 million gallons per day of tertiary treated wastewater from the Northwest Wastewater Treatment Facility, hereinafter Facility. The application was deemed complete.

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. Veolia Water West Operating Services Inc. is the operator of the Northwest Wastewater Treatment Facility, which is owned by the City of Rio Vista. The treatment system consists of fine screenings followed by activated sludge treatment via anoxic and aerobic basins, followed by membrane biological reactors (MBR) which separate the liquid wastewater from the solids. The liquid wastewater from the MBRs is disinfected using ultraviolet light (UV). The solids from the activated process are dewatered using belt filter press technology followed by drying in solar greenhouses. Once dried, the material meets “Exceptional Class A” biosolids criteria and is being stockpiled in one of the solar greenhouses prior to disposal at a regulated Class III landfill. A 2 million gallon emergency storage basin lined with a high density polyethylene is used to accommodate flows in excess of the peak hydraulic capacity of 3 million gallon per day (MGD). Wastewater is discharged from Discharge Point No. 001 (see table on cover page) to the Sacramento River, a water of the United States,

within the Sacramento-San Joaquin Delta. Attachment B provides a map of the area around the Facility. Attachment C provides a flow schematic of the Facility.

C. Legal Authorities. This Order is issued pursuant to section 402 of the Clean Water Act (CWA) and implementing regulations adopted by USEPA and chapter 5.5, division 7 of the California Water Code (CWC; commencing with section 13370). It shall serve as a NPDES permit for point source discharges from this facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (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 E and G through J are also incorporated into this Order.

E. California Environmental Quality Act (CEQA). Under CWC 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 (40 CFR 122.44), require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards. The discharge authorized by this Order must meet minimum federal technology-based requirements based on Secondary Treatment Standards at 40 CFR Part 133 and Best Professional Judgment (BPJ) in accordance with 40 CFR 125.3. A detailed discussion of the technology-based effluent limitations development is included in the Fact Sheet.

G. Water Quality-Based Effluent Limitations (WQBELs). Section 301(b) of the CWA and 40 CFR 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, that are necessary to achieve water quality standards. 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.

40 CFR 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, WQBELs must be established using: (1) USEPA 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 122.44(d)(1)(vi).

H. Water Quality Control Plans. The Regional Water Board adopted a *Water Quality Control Plan*, *Fourth Edition (Revised February 2007),* for the Sacramento and San Joaquin River Basins (hereinafter Basin Plan) on 1 September 1998 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 Sacramento River within the Sacramento-San Joaquin Delta are as follows:

Table 5. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	Sacramento River within the Sacramento-San Joaquin Delta	Existing: Municipal and domestic supply (MUN); agricultural supply, including irrigation and stock watering (AGR); industrial process supply (PROC); industrial service supply (IND); water contact recreation, including canoeing and rafting (REC-1); non-contact water recreation (REC-2); warm freshwater habitat (WARM); cold freshwater habitat (COLD); migration of aquatic organisms, warm and cold (MIGR); spawning, reproduction, and/or early development, warm and cold (SPWN); wildlife habitat (WILD); and navigation (NAV).

The Basin Plan includes a list of Water Quality Limited Segments (WQLSs), which are defined as "…*those sections of lakes, streams, rivers or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate limitations for point sources (40 CFR 130, et seq.)*." The Basin Plan also states, "*Additional treatment beyond minimum federal standards will be imposed on dischargers to WQLSs. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment*." The western portion of the Sacramento-San Joaquin Delta Waterways is listed as a WQLS for chlorpyrifos, DDT, diazinon, electrical conductivity, exotic species, group A pesticides, mercury and unknown toxicity in the 303(d) list of impaired water bodies.

The State Water Board adopted the *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California* (Thermal Plan) on 18 May 1972, and amended this plan on 18 September 1975. This plan contains temperature objectives for surface waters. Requirements of this Order implement the Thermal Plan.

The *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan) was adopted in May 1995 by the State Water Board superseding the 1991 Bay-Delta Plan. The Bay-Delta Plan identifies the beneficial uses of the estuary and includes objectives for flow, salinity, and endangered species protection.

The Bay-Delta Plan attempts to create a management plan that is acceptable to the stakeholders while at the same time is protective of beneficial uses of the Sacramento – San Joaquin Delta. The State Water Board adopted Decision 1641 (D-1641) on 29 December 1999. D-1641 implements flow objectives for the Bay-Delta Estuary, approves a petition to change points of diversion of the Central Valley Project and the State Water Project in the Southern Delta, and approves a petition to change places of use and purposes of use of the Central Valley Project. The water quality objectives of the Bay-Delta Plan are implemented as part of this Order.

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

I. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** USEPA adopted the NTR on 22 December 1992, and later amended it on 4 May 1995 and 9 November 1999. About 40 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 28 2000 with respect to the priority pollutant criteria promulgated for California by 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 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 Water 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 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, but may issue a Time Schedule Order pursuant to CWC section 13300 or a Cease and Desist Order pursuant to CWC section 13301 where it finds that the discharger is violating or threatening to violate the permit. 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, and 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.

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 does not include compliance schedules and interim effluent limitations or discharge specifications.

L. Alaska Rule. On 30 March 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards become effective for CWA purposes. (40 CFR 131.21 and 65 FR 24641 (27 April 2000).) Under the revised regulation (also known as the Alaska rule), new and revised standards submitted to USEPA after 30 May 2000, must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by 30 May 2000 may be used for CWA purposes, whether or not approved by USEPA.

M. Stringency of Requirements for Individual Pollutants. This Order contains both technology-based effluent limitations and WQBELs for individual pollutants. The technology-based effluent limitations consist of restrictions on biochemical oxygen demand (BOD)(5-day @ 20°C); total suspended solids (TSS) and pH. The WQBELs consist of restrictions on aluminum, ammonia, copper, electrical conductivity, iron, and nitrate plus nitrite. This Order's technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements. In addition, this Order

includes effluent limitations for pathogens to meet numeric objectives or protect beneficial uses.

WQBELs 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 WQBELs were derived from the CTR, the CTR is the applicable standard pursuant to 40 CFR 131.38. The scientific procedures for calculating the individual WQBELs for priority pollutants are based on the CTR-SIP, which was approved by USEPA on 18 May 2000. All beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by USEPA prior to 30 May 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to 30 May 2000, but not approved by USEPA before that date, are nonetheless "*applicable water quality standards for purposes of the [Clean Water] Act*" pursuant to 40 CFR 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the technology-based requirements of the CWA and the applicable water quality standards for purposes of the CWA.

N. Antidegradation Policy. 40 CFR 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, the permitted discharge is consistent with the antidegradation provision of 40 CFR 131.12 and Resolution No. 68-16.

O. Anti-Backsliding Requirements. Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as the effluent limitations in Order No. R5-2004-0092. As discussed in detail in the Fact Sheet, this relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations.

P. 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.

Q. Monitoring and Reporting. 40 CFR 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. CWC sections 13267 and 13383 authorize the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program establishes monitoring and reporting requirements to implement federal and State requirements. The Monitoring and Reporting Program is provided in Attachment E.

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

S. Provisions and Requirements Implementing State Law. The provisions/requirements in sections IV.B, IV.C, V.B, and VI.C.4 of this Order are included to implement state law only. These provisions/requirements are not required or authorized under the federal CWA; consequently, violations of these provisions/requirements are not subject to the enforcement remedies that are available for NPDES violations.

T. Notification of Interested Parties. The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe WDRs 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 of this Order.

U. 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.

THEREFORE, IT IS HEREBY ORDERED, that Order No.R5-2004-0092 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 CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal CWA and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

III. DISCHARGE PROHIBITIONS

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

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

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.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations – Discharge Point No. 001

1. Final Effluent Limitations – Discharge Point No. 001

a. The Discharger shall maintain compliance with the following effluent limitations at Discharge Point No. 001, with compliance measured at Monitoring Location EFF-001 as described in the Monitoring and Reporting Program:

Table 6. Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Biochemical Oxygen Demand 5-day @ 20°C	mg/L	10	15	20	--	--
	lbs/day[1]	83	125	167	--	--
Total Suspended Solids	mg/L	10	15	20	--	--
	lbs/day[1]	83	125	167	--	--
pH	Standard Units	--	--	--	6.5	8.5
Aluminum, Total Recoverable	µg/L	443	--	750	--	--
Ammonia (as N)	mg/L	1.1	--	2.1	--	--
	lbs/day[1]	9	--	18	--	--
Copper, Total Recoverable	µg/L	19	--	25	--	--
Iron, Total Recoverable	µg/L	--	--	300	--	--
Nitrate + Nitrite (as N)	mg/L	10	--	--	--	--

1. Based on a design average dry weather flow of 1.0 mgd.

b. Percent Removal. The average monthly percent removal of 5-day biochemical oxygen demand (BOD_5) and total suspended solids (TSS) 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. **Temperature.** The maximum temperature of the discharge shall not exceed the natural receiving water temperature by more than 20°F.

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

   i. 23 MPN/100 mL as a 7-day median; and
   ii. 240 MPN/100 mL more than once in any 30 day period.

f. **Average Dry Weather Flow.** The average dry weather discharge flow shall not exceed 1.0 mgd.

g. **Aluminum, Total Recoverable.** For a calendar year, the annual average effluent total recoverable aluminum concentration shall not exceed 200 µg/L.

h. **Electrical Conductivity @ 25°C.** For a calendar year, the annual average effluent electrical conductivity shall not exceed 1,500 µmhos/cm.

2. **Interim Effluent Limitations**

   a. **Mercury, Total Recoverable.** Effective immediately, the total calendar year mass discharge of total mercury shall not exceed 0.022 pounds. This interim performance-based limitation shall be in effect until the Regional Water Board establishes final effluent limitations after adoption of the Sacramento-San Joaquin Delta Methylmercury TMDL.

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 Sacramento 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 10 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.** 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 or raised above 8.5.

9. **Pesticides:**

   a. Pesticides to be present, individually or in combination, in concentrations that adversely affect beneficial uses;

   b. Pesticides to be present in bottom sediments or aquatic life in concentrations that adversely affect beneficial uses;

   c. Total identifiable persistent chlorinated hydrocarbon pesticides to be present in the water column at concentrations detectable within the accuracy of analytical methods approved by USEPA or the Executive Officer;

   d. Pesticide concentrations to exceed those allowable by applicable antidegradation policies (see State Water Board Resolution No. 68-16 and 40 CFR 131.12.);

   e. Pesticide concentrations to exceed the lowest levels technically and economically achievable;

   f. Pesticides to be present in concentration in excess of the maximum contaminant levels set forth in CCR, Title 22, division 4, chapter 15; nor

   g. Thiobencarb to be present in excess of 1.0 µg/L.

10. **Radioactivity:**

   a. Radionuclides to be present in concentrations that are harmful/deleterious 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. **Salinity.** The electrical conductivity (EC) to exceed the maximum 14-day running average of mean daily EC in µmhos/cm in the table below:

Date	Water Year Type[1]				
	Wet	Above Normal	Below Normal	Dry	Critical
1 April – 14 June	450	450	450	450	2780
15June – 19 June	450	450	450	1670	2780
20 June – 30 June	450	450	1140	1670	2780
1 July – 15 August	450	630	1140	1670	2780

[1] Sacramento Valley Water Year Hydrologic Classification

12. **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.

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

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

15. **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.

16. **Temperature:**

a. Elevated temperature waste discharges either individually or combined with other discharges shall not create a zone, defined by water temperatures or more than 1°F above natural receiving water temperature, which exceeds 25 percent of the cross-sectional area of a main river channel at any point.

b. No discharge shall cause a surface water temperature rise greater than 4°F above the natural temperature of the receiving waters at any time or place.

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

18. **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; nor

    d. More than 10 percent where natural turbidity is greater than 100 NTUs.

B. Groundwater Limitations

1. The discharge shall not cause the groundwater to exceed water quality objectives, adversely impact beneficial uses, or cause a condition of pollution or nuisance.

2. Release of waste constituents from any portion of the Facility shall not, in combination with other sources, cause the following in groundwater within the influence of the Facility:

    a. Adversely impact beneficial uses or exceed water quality objectives.

    b. Contain chemicals, heavy metals, or trace elements in concentrations that adversely affect beneficial uses or exceed maximum contaminant levels specified in 22 CCR, Division 4, Chapter 15.

    c. Exceed concentrations of radionuclides specified in 22 CCR, Division 4, Chapter 15.

    d. Contain concentrations of chemical constituents in amounts that adversely affect agricultural use.

    e. Equal or exceed total coliform organisms median of 2.2 MPN/100 mL over any 7-day period.

    f. Exhibit a pH of less than 6.5 or greater than 8.4 pH units.

    g. Impart taste, odor, toxicity, or color that creates nuisance or impairs any beneficial use.

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 26.

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 CWA, or the standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued.

- *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 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. 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.

i. 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 5 years on effluent quality and on the capability of the Discharger to comply with the terms and conditions of the Order. The adequacy of the safeguards is subject to the approval of the 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 90 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.

j. 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 contained in section VI.A.2.i. of this Order.

The technical report shall:

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

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

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

The 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.

k. A publicly owned treatment works 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 3 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 4 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.

l. 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.

m. 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.

n. For publicly owned treatment works, 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).

o. 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 5 days, unless the Regional Water Board waives confirmation. The written notification shall include the information required by the Standard Provision contained in Attachment D section V.E.1.
[40 CFR 122.41(l)(6)(i)].

p. Failure to comply with provisions or requirements of this Order, or violation of other applicable laws or regulations governing discharges from this facility, may subject the Discharger to administrative or civil liabilities, criminal penalties, and/or other enforcement remedies to ensure compliance. Additionally, certain violations may subject the Discharger to civil or criminal enforcement from appropriate local, state, or federal law enforcement entities.

q. In the event 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 CWC. Transfer shall be approved or disapproved in writing by the Executive Officer.

B. Monitoring and Reporting Program Requirements

The Discharger shall comply with the Monitoring and Reporting Program, and future revisions thereto, in Attachment E of this Order.

C. Special Provisions

1. Reopener Provisions

a. Conditions that necessitate a major modification of a permit are described in 40 CFR 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.

b. This Order may be reopened for modification, or revocation and reissuance, as a result of the detection of a reportable priority pollutant generated by 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.

c. Mercury. If a TMDL program for methyl mercury is adopted, this Order shall be reopened and the interim mass effluent limitation modified (higher or lower) or an effluent concentration limitation imposed. 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. Pollution Prevention. This Order requires the Discharger to prepare and implement a pollution prevention plan following CWC section 13263.3(d)(3) for mercury. Based on a review of the pollution prevention plans, this Order may be

reopened for addition and/or modification of effluent limitations and requirements for this constituent.

e. **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.

f. **Water Effects Ratios (WER) and Metal Translators.** A default WER of 1.0 has been used in this Order for calculating CTR criteria for applicable priority pollutant inorganic constituents. In addition, default dissolved-to-total metal translators have been used to convert water quality objectives from dissolved to total recoverable when developing effluent limitations for inorganic constituents. If the Discharger performs studies to determine site-specific WERs and/or site-specific dissolved-to-total metal translators, this Order may be reopened to modify the effluent limitations for the applicable inorganic constituents.

g. **Reclamation Feasibility Study.** This Order requires the Discharger to complete and submit a report on the results of a feasibility evaluation for the reclamation of treated effluent to the Trilogy Golf Course. Based on a review of the results of the Reclamation Feasibility Study, this Order may be reopened to include additional requirements to implement reclamation to the Trilogy Golf Course if the Discharger determines that reclamation is feasible.

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 (WET) 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 exhibits toxicity exceeding the numeric toxicity monitoring trigger during accelerated monitoring established in this Provision, the Discharger is required to initiate a TRE in accordance with an approved TRE Work Plan, and take actions to mitigate the impact of the discharge and prevent recurrence of toxicity. A TRE is a site-specific study conducted in a stepwise process to identify the source(s) of toxicity and the effective control measures for effluent toxicity. TREs are designed to identify the causative agents and sources of 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 a 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 (TIE), if necessary (e.g., 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. The Discharger shall initiate a TRE to address effluent toxicity if any WET testing results exceed the numeric toxicity monitoring trigger during accelerated monitoring.

iii. **Numeric Toxicity Monitoring Trigger.** The numeric toxicity monitoring trigger to initiate a TRE is > **16 TU_C** (where TU_C = 100/NOEC). The monitoring trigger is not an effluent limitation; it is the toxicity threshold at which the Discharger is required to begin accelerated monitoring and initiate a TRE when the effluent exhibits toxicity.

iv. **Accelerated Monitoring Specifications.** If the numeric toxicity monitoring trigger is exceeded during regular chronic toxicity testing, the Discharger shall initiate accelerated monitoring within 14 days of notification by the laboratory of the exceedance. Accelerated monitoring shall consist of four (4) chronic toxicity tests conducted once every 2 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 effluent toxicity, the Executive Officer may require that the Discharger initiate a TRE.

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

(1) Specific actions the Discharger will take to investigate and identify the cause(s) of toxicity, including a 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 USEPA guidance[1].

b. Water Reclamation Study. The Discharger shall perform a water reclamation study to evaluate beneficial reuse of the tertiary treated wastewater for uses including (but not limited to) landscape irrigation on the Trilogy Golf Course. The Discharger shall evaluate the technical, logistical, and economic feasibility of conveying treated effluent to the Trilogy Golf Course for landscape irrigation consistent with Title 22 of the California Code of Regulations. Studies to determine the feasibility of reuse should include, but are not limited to, salt balance, potential groundwater impact evaluations, evaluation of current groundwater background quality at the Trilogy Golf Course site, evaluation of treatment needs, evaluation of impacts to receiving water if discharge removed, and economic impacts to the City of Rio Vista. Since the Facility currently discharges well below its maximum permitted discharge of 1 mgd, the Study shall complete the evaluation based on the observed maximum discharge of 0.2 mgd. The study shall be completed in conformance with the following schedule:

[1] See the Fact Sheet (Attachment F section VII.B.2.a.) for a list of USEPA guidance documents that must be considered in development of the TRE Work Plan.

Task	Compliance Date
i. Submit Work Plan and Time Schedule	**No later than 6 months** following adoption of this Order.
ii. Complete Study and submit Study Report	**No later than three years** from adoption of this Order.

3. Best Management Practices and Pollution Prevention

a. Pollution Prevention Plan for Mercury. The Discharger shall prepare and implement a pollution prevention plan for mercury in accordance with CWC section 13263.3(d)(3). The minimum requirements for the pollution prevention plan are outlined in the Fact Sheet (Attachment F section VII.B.3 (a). A work plan and time schedule for preparation of the pollution prevention plan shall be completed and submitted **within 6 months of the effective date of this Order** for approval by the Executive Officer. The pollution prevention plan shall be completed and submitted to the Regional Water Board within 18 months following work plan approval by the Executive Officer. Progress reports shall be submitted in accordance with the Monitoring and Reporting Program (Attachment E section X.D.1.)

b. Salinity Evaluation and Minimization Plan. The Discharger shall prepare a salinity evaluation and minimization plan to address sources of salinity from the Facility and shall provide annual reports demonstrating reasonable progress in the reduction of salinity in its discharge to the Sacramento River. The plan shall be completed and submitted to the Regional Water Board **within 9 months of the adoption date of this Order** for the approval by the Executive Officer. The annual reports shall be submitted in accordance with the Monitoring and Reporting Program (Attachment E, Section X.D.1).

4. Construction, Operation and Maintenance Specifications

a. Ultraviolet (UV) Disinfection System Operating Specifications. The Discharger shall operate the UV disinfection system to provide a minimum UV dose of 100 millijoules per square centimeter (mJ/cm^2) at peak daily flow, unless otherwise approved by the California Department of Public Health, and shall maintain an adequate dose for disinfection while discharging to the Sacramento River, unless otherwise approved by the California Department of Public Health.

i. The Discharger shall provide continuous, reliable monitoring of flow, UV transmittance, UV power, and turbidity.

ii. The Discharger shall operate the treatment system to insure that turbidity prior to disinfection shall not exceed 2 NTU as a daily average, and 5 NTU more than 5 percent of the time within a 24-hour period, and 10 NTU, at any time.

iii. The UV transmittance (at 254 nanometers) in the wastewater exiting the UV disinfection system shall not fall below 55 percent of maximum at any time.

iv. The quartz sleeve and cleaning system components must be visually inspected per the manufacturer's operations manual for physical wear (scoring, solarization, seal leaks, cleaning fluid levels, etc.) and to check the efficacy of the cleaning system.

v. The sleeves must be cleaned periodically as necessary to meet the requirements.

vi. Lamps must be replaced per the manufacturer's operations manual, or sooner, if there are indications the lamps are failing to provide adequate disinfection. Lamp age and lamp replacement records must be maintained.

vii. The Facility must operate in accordance with an operations and maintenance program that assures adequate disinfection.

b. Emergency Storage Pond Operating Specifications.

i. The treatment facilities shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

ii. Public contact with wastewater shall be precluded through such means as fences, signs, and other acceptable alternatives.

iii. Ponds shall be managed to prevent breeding of mosquitoes. In particular,

(a) An erosion control program should assure that small coves and irregularities are not created around the perimeter of the water surface.

(b) Weeds shall be minimized.

(c) Dead algae, vegetation, and debris shall not accumulate on the water surface.

iv. Freeboard shall never be less than 2 feet (measured vertically to the lowest point of overflow.

v. The discharge of waste classified as "hazardous" as defined in section 2521(a) of Title 23, California Code of Regulations (CCR), or "designated", as defined in section 13173 of the CWC, to the treatment ponds is prohibited.

vi. Objectionable odors originating at this Facility shall not be perceivable beyond the limits of the wastewater treatment and disposal areas (or property owned by the Discharger).

5. Special Provisions for Municipal Facilities (POTWs Only)

a. Pretreatment Requirements – NOT APPLICABLE

b. Sludge/Biosolids Discharge Specifications

i. Collected screenings, residual sludge, biosolids, and other solids removed from liquid wastes shall be disposed of in a manner approved by the Executive Officer, and consistent with Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste, as set forth in Title 27, CCR, division 2, subdivision 1, section 20005, et seq. Removal for further treatment, disposal, or reuse at sites (e.g., landfill, composting sites, soil amendment sites) that are operated in accordance with valid waste discharge requirements issued by a Regional Water Board will satisfy these specifications.

ii. Sludge and solid waste shall be removed from screens, sumps, ponds, clarifiers, etc. as needed to ensure optimal plant performance.

iii. The treatment of sludge generated at the Facility shall be confined to the Facility property and conducted in a manner that precludes infiltration of waste constituents into soils in a mass or concentration that will violate groundwater limitations in section V.B. of this Order. In addition, the storage of residual sludge, solid waste, and biosolids on Facility property shall be temporary and controlled, and contained in a manner that minimizes leachate formation and precludes infiltration of waste constituents into soils in a mass or concentration that will violate groundwater limitations included in section V.B. of this Order.

iv. The use and disposal of biosolids shall comply with existing federal and state laws and regulations, including permitting requirements and technical standards included in 40 CFR Part 503. If the State Water Board and the Regional Water Board are given the authority to implement regulations contained in 40 CFR Part 503, this Order may be reopened to incorporate appropriate time schedules and technical standards. The Discharger must comply with the standards and time schedules contained in 40 CFR Part 503 whether or not they have been incorporated into this Order.

c. Biosolids Disposal Requirements

i. The Discharger shall comply with the Monitoring and Reporting Program for biosolids disposal contained in Attachment E.

ii. Any proposed change in biosolids use or disposal practice from a previously approved practice shall be reported to the Executive Officer and USEPA Regional Administrator at least **90 days** in advance of the change.

iii. The Discharger is encouraged to comply with the "Manual of Good Practice for Agricultural Land Application of Biosolids" developed by the California Water Environment Association.

d. Biosolids Storage Requirements

i. Facilities for the storage of Class B biosolids shall be located, designed, and maintained to restrict public access to biosolids.

ii. Biosolids storage facilities shall be designed and maintained to prevent washout or inundation from a storm or flood with a return frequency of 100 years.

iii. Biosolids storage facilities, which contain biosolids, shall be designed and maintained to contain all storm water falling on the biosolids storage area during a rainfall year with a return frequency of 100 years.

iv. Biosolids storage facilities shall be designed, maintained, and operated to minimize the generation of leachate.

e. Collection System. On 2 May 2006, the State Water Board adopted State Water Board Order No. 2006-0003, a Statewide General WDR for Sanitary Sewer Systems. The Discharger shall be subject to the requirements of Order No. 2006-0003 and any future revisions thereto. Order No. 2006-0003 requires that all public agencies that currently own or operate sanitary sewer systems apply for coverage under the General WDR. By 2 November 2006, the Discharger was required by that Order, not incorporated by reference herein, to apply for coverage under State Water Board Order 2006-0003 for operation of its wastewater collection system.

Regardless of the coverage obtained under Order No. 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 122.41(e)], report any non-compliance [40 CFR 122.41(l)(6) and (7)], and mitigate any discharge from the collection system in violation of this Order [40 CFR 122.41(d)].

6. Other Special Provisions

a. Wastewater shall be oxidized, coagulated, filtered, and adequately disinfected pursuant to the Department of Public Health (DPH; formerly the Department of Health Services) reclamation criteria, CCR, Title 22, division 4, chapter 3, (Title 22), or equivalent.

b. In the event of any change in control of 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 numbers 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 – NOT APPLICABLE

VII. COMPLIANCE DETERMINATION

A. BOD_5 and TSS Effluent Limitations (Section IV.A.1.a). Compliance with the final effluent limitations for BOD_5 and TSS required in Limitations and Discharge Requirements section IV.A shall be ascertained by 24-hour composite samples. Compliance with effluent limitations required in Limitations and Discharge Requirements section IV.A for percent removal shall be calculated using the arithmetic mean of BOD_5 and TSS 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.a. and IV.A.1.g). Compliance with the final effluent limitations for aluminum can be demonstrated using either total or acid-soluble (inductively coupled plasma/atomic emission spectrometry or inductively coupled plasma/mass spectrometry) analysis methods, as supported by USEPA's Ambient Water Quality Criteria for Aluminum document (EPA 440/5-86-008), or other standard methods that exclude aluminum silicate particles as approved by the Executive Officer.

C. Total Mercury Mass Loading Effluent Limitations (Section IV.A.2.a). The procedures for calculating mass loadings are as follows:

1. The total pollutant mass load for each individual calendar month shall be determined using an average of all concentration data collected that month and the corresponding total monthly flow. All effluent 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. Average Dry Weather Flow Effluent Limitations (Section IV.A.1.f). The average dry weather discharge flow represents the daily average flow when groundwater is at or near normal and runoff is not occurring. Compliance with the average dry weather 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).

E. Total Coliform Organisms Effluent Limitations (Section IV.A.1.e). 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 7 days. For example, if a sample is collected on a Wednesday, the result from that sampling event and all results from the previous 6 days (i.e., Tuesday, Monday, Sunday, Saturday, Friday, and Thursday) are used to calculate the 7-day median. If the 7-day median of total coliform organisms exceeds a most probable number (MPN) of 23 per 100 milliliters, the Discharger will be considered out of compliance.

F. Mass Effluent Limitations. The mass effluent limitations contained in Final Effluent Limitations IV.A.1.a are based on the permitted average dry weather flow and calculated as follows:

Mass (lbs/day) = Flow (mgd) x Concentration (mg/L) x 8.34 (conversion factor)

If the effluent flow exceeds the permitted average dry weather flow during wet-weather seasons, the effluent mass limitations contained in Final Effluent Limitations IV.A.1.a shall not apply.

If the effluent flow is below the permitted average dry weather flow during the wet-weather season, the effluent mass limitations contained in Final Effluent Limitations IV.A.1.a shall apply.

ATTACHMENT A – DEFINITIONS

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

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

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

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

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

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

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

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

The daily discharge may be determined by the analytical results of a composite sample taken over the course of 1 day (a calendar day or other 24-hour period defined as a day) or by the arithmetic mean of analytical results from one or more grab samples taken over the course of the day.

For composite sampling, if 1 day is defined as a 24-hour period other than a calendar day, the analytical result for the 24-hour period will be considered as the result for the calendar day in which the 24-hour period ends.

Detected, but Not Quantified (DNQ)
DNQ are those sample results less than the RL, but greater than or equal to the laboratory's MDL.

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

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

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

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

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

Inland Surface Waters
All surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

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

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

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

Median
The middle measurement in a set of data. The median of a set of data is found by first arranging the measurements in order of magnitude (either increasing or decreasing order). If the number of measurements (n) is odd, then the median = $X_{(n+1)/2}$. If n is even, then the median = $(X_{n/2} + X_{(n/2)+1})/2$ (i.e., the midpoint between the $n/2$ and $n/2+1$).

Method Detection Limit (MDL)
MDL is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in 40 CFR Part 136, Attachment B, revised as of 3 July 1999.

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

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

Not Detected (ND)
Sample results which are less than the laboratory's MDL.

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

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

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

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

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

Source of Drinking Water
Any water designated as municipal or domestic supply (MUN) in a Regional Water Board Basin Plan.

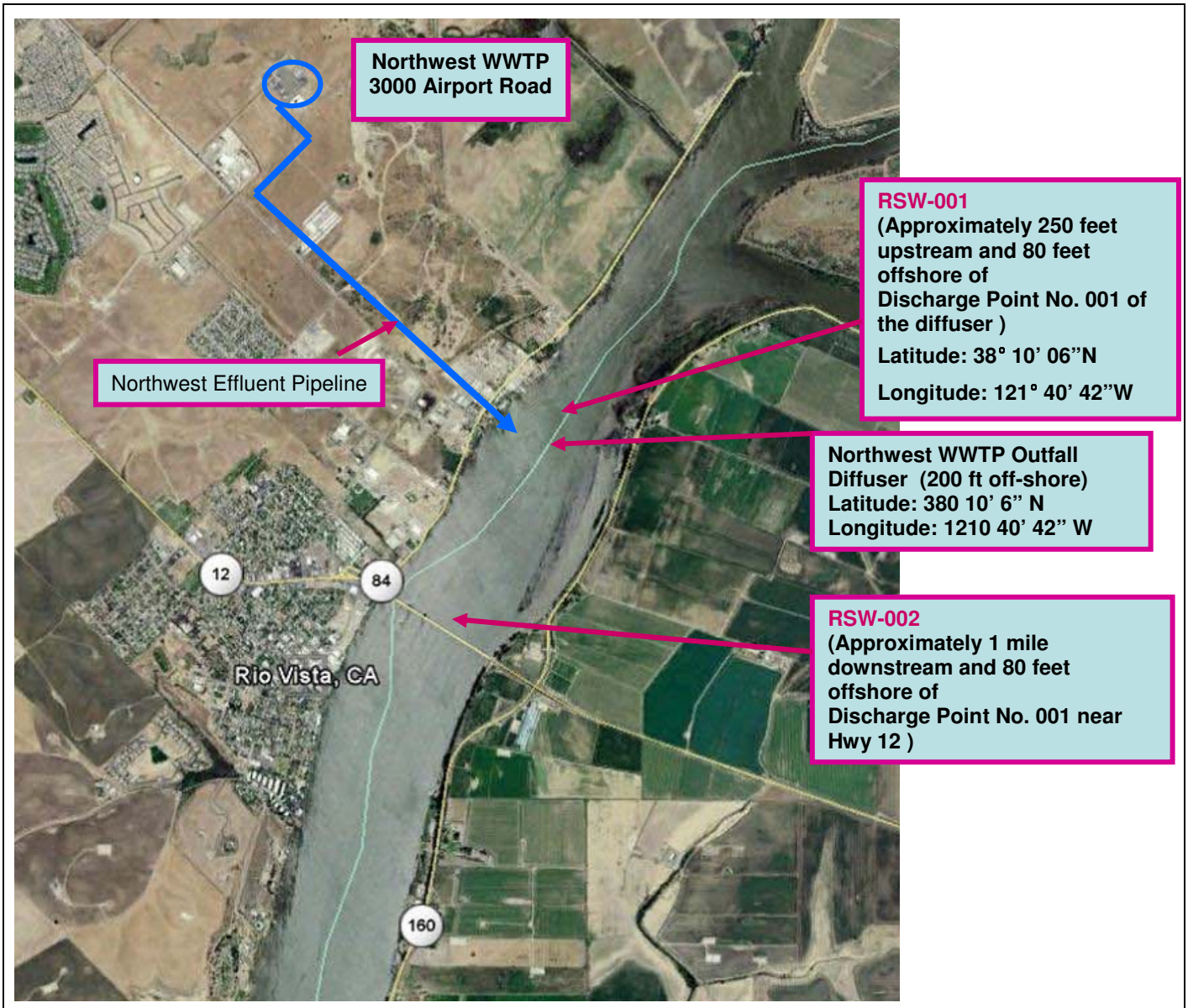
Standard Deviation (σ)
Standard Deviation is a measure of variability that is calculated as follows:

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

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

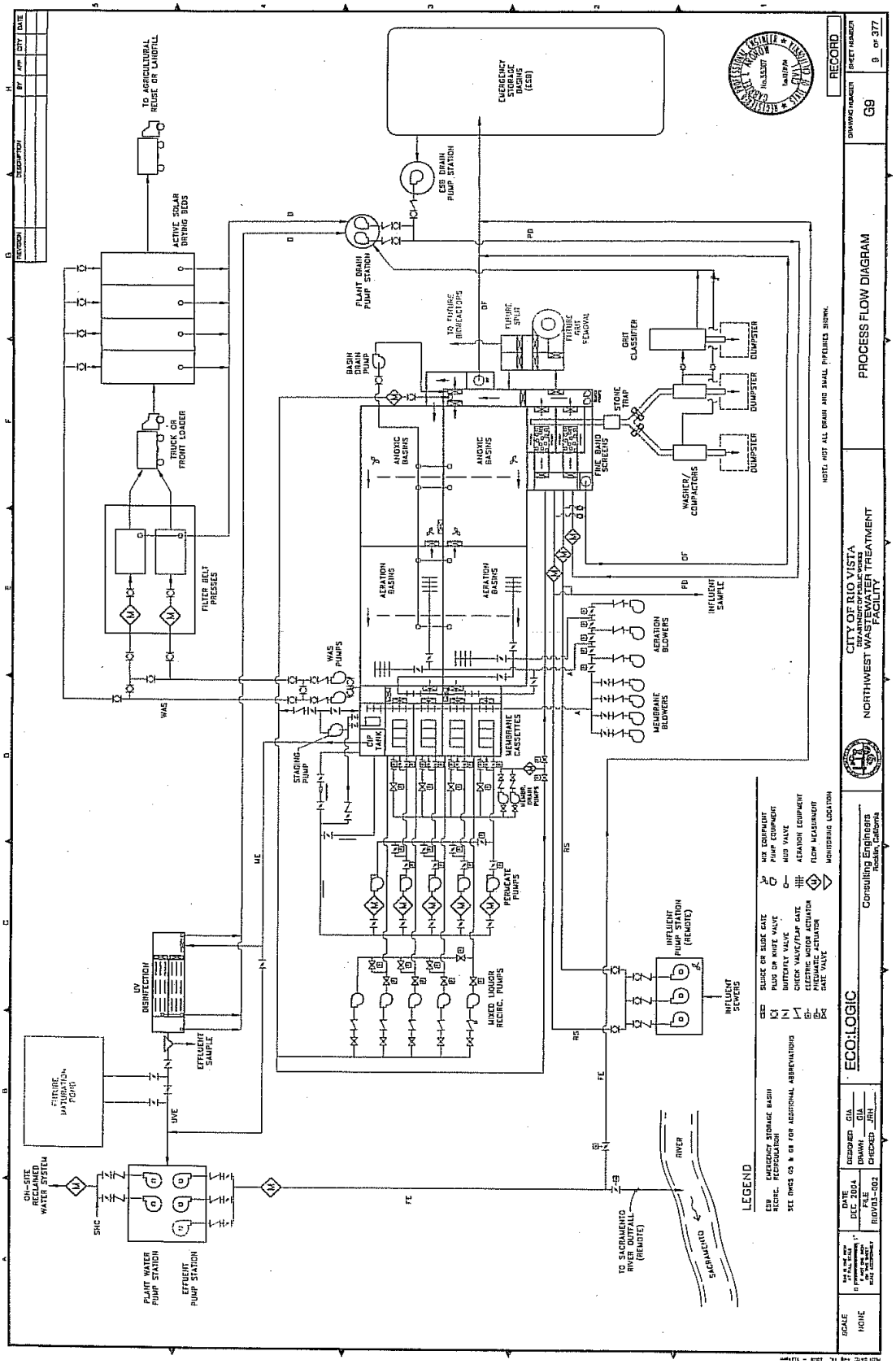
Toxicity Reduction Evaluation (TRE)
TRE is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. 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



Drawing Reference: U.S.G.S TOPOGRAPHIC MAP 7.5 MINUTE QUADRANGLE ***Not to scale***	SITE LOCATION MAP CITY OF RIO VISTA NORTHWEST WASTEWATER TREATMENT FACILITY Solano County	N W E S

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 (CWC) and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. (40 CFR 122.41(a).)

2. The Discharger shall comply with effluent standards or prohibitions established under section 307(a) of the 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 CFR 122.41(a)(1).)

B. Need to Halt or Reduce Activity Not a Defense

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

C. Duty to Mitigate

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

D. Proper Operation and Maintenance

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

E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges. (40 CFR 122.41(g).)

2. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations. (40 CFR 122.5(c).)

F. Inspection and Entry

The Discharger shall allow the Regional Water Board, State Water Board, United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to (40 CFR 122.41(i); CWC section 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 CFR 122.41(i)(1));

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

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

4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the CWC, any substances or parameters at any location. (40 CFR 122.41(i)(4).)

G. Bypass

1. Definitions

   a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. (40 CFR 122.41(m)(1)(i).)

   b. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. (40 CFR 122.41(m)(1)(ii).)

2. Bypass not exceeding limitations. The Discharger may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions – Permit Compliance I.G.3, I.G.4, and I.G.5 below. (40 CFR 122.41(m)(2).)

3. Prohibition of bypass. Bypass is prohibited, and the Regional Water Board may take enforcement action against a Discharger for bypass, unless (40 CFR 122.41(m)(4)(i)):

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage (40 CFR 122.41(m)(4)(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 CFR 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 CFR 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 CFR 122.41(m)(4)(ii).)

5. Notice

a. Anticipated bypass. If the Discharger knows in advance of the need for a bypass, it shall submit a notice, if possible at least 10 days before the date of the bypass. (40 CFR 122.41(m)(3)(i).)

b. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below (24-hour notice). (40 CFR 122.41(m)(3)(ii).)

H. Upset

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the 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 CFR 122.41(n)(1).)

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Standard Provisions – Permit Compliance I.H.2 below are met. No determination made during administrative review of claims that noncompliance was

caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. (40 CFR 122.41(n)(2).)

2. Conditions necessary for a demonstration of upset. A Discharger who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that (40 CFR 122.41(n)(3)):

a. An upset occurred and that the Discharger can identify the cause(s) of the upset (40 CFR 122.41(n)(3)(i));

b. The permitted facility was, at the time, being properly operated (40 CFR 122.41(n)(3)(ii));

c. The Discharger submitted notice of the upset as required in Standard Provisions – Reporting V.E.2.b below (24-hour notice) (40 CFR 122.41(n)(3)(iii)); and

d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above. (40 CFR 122.41(n)(3)(iv).)

3. Burden of proof. In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof. (40 CFR 122.41(n)(4).)

II. STANDARD PROVISIONS – PERMIT ACTION

A. General

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

B. Duty to Reapply

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

C. Transfers

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

III. STANDARD PROVISIONS – MONITORING

A. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (40 CFR 122.41(j)(1).)

B. Monitoring results must be conducted according to test procedures under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503 unless other test procedures have been specified in this Order. (40 CFR 122.41(j)(4) and 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 5 years (or longer as required by 40 CFR 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 CFR 122.41(j)(2).)

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements (40 CFR 122.41(j)(3)(i));

2. The individual(s) who performed the sampling or measurements (40 CFR 122.41(j)(3)(ii));

3. The date(s) analyses were performed (40 CFR 122.41(j)(3)(iii));

4. The individual(s) who performed the analyses (40 CFR 122.41(j)(3)(iv));

5. The analytical techniques or methods used (40 CFR 122.41(j)(3)(v)); and

6. The results of such analyses. (40 CFR 122.41(j)(3)(vi).)

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

1. The name and address of any permit applicant or Discharger (40 CFR 122.7(b)(1)); and

2. Permit applications and attachments, permits and effluent data. (40 CFR 122.7(b)(2).)

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information

The Discharger shall furnish to the Regional Water Board, State Water Board, or USEPA within a reasonable time, any information which the Regional Water Board, State Water Board, or USEPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the Regional Water Board, State Water Board, or USEPA copies of records required to be kept by this Order. (40 CFR 122.41(h); 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 CFR 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 CFR 122.22(a)(3).).

3. All reports required by this Order and other information requested by the Regional Water Board, State Water Board, or USEPA shall be signed by a person described in 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 CFR 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 CFR 122.22(b)(2)); and

c. The written authorization is submitted to the Regional Water Board and State Water Board. (40 CFR 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 CFR 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 CFR 122.22(d).)

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program (Attachment E) in this Order. (40 CFR 122.22(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 CFR 122.41(l)(4)(i).)

3. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR 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 CFR 122.41(l)(4)(ii).)

4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order. (40 CFR 122.41(l)(4)(iii).)

D. Compliance Schedules

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

E. Twenty-Four Hour Reporting

1. The Discharger shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission shall

also be provided within five (5) days of the time the Discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. (40 CFR 122.41(l)(6)(i).)

2. The following shall be included as information that must be reported within 24 hours under this paragraph (40 CFR 122.41(l)(6)(ii)):

a. Any unanticipated bypass that exceeds any effluent limitation in this Order. (40 CFR 122.41(l)(6)(ii)(A).)

b. Any upset that exceeds any effluent limitation in this Order. (40 CFR 122.41(l)(6)(ii)(B).)

3. The Regional Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours. (40 CFR 122.41(l)(6)(iii).)

F. Planned Changes

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

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b) (40 CFR 122.41(l)(1)(i)); or

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are not subject to effluent limitations in this Order. (40 CFR 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 CFR 122.41(l)(1)(iii).)

G. Anticipated Noncompliance

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

H. Other Noncompliance

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

I. Other Information

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

VI. STANDARD PROVISIONS – ENFORCEMENT

A. 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

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 CFR 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 CFR 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 CFR 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 CFR 122.42(b)(3).)

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ATTACHMENT E – MONITORING AND REPORTING PROGRAM

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

I. GENERAL MONITORING PROVISIONS

A. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring locations specified below and, unless otherwise specified, before the monitored flow joins or is diluted by any other waste stream, body of water, or substance. Monitoring locations shall not be changed without notification to and the approval of this Regional Water Board.

B. Effluent samples shall be taken downstream of the last addition of wastes to the treatment or discharge works where a representative sample may be obtained prior to mixing with the receiving waters. Samples shall be collected at such a point and in such a manner to ensure a representative sample of the discharge.

C. Chemical, bacteriological, and bioassay analyses of any material required by this Order shall be conducted by a laboratory certified for such analyses by the Department of Public Health (DPH; formerly the Department of Health Services). Laboratories that perform sample analyses must be identified in all monitoring reports submitted to the Regional Water Board. In the event that 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 the Regional Water Board staff. The Quality Assurance-Quality Control Program must conform to USEPA guidelines or to procedures approved by the Regional Water Board.

D. All analyses shall be performed in a laboratory certified to perform such analyses by DPH. Laboratories that perform sample analyses must be identified in all monitoring reports submitted to the Regional Water Board. The Discharger shall institute a Quality Assurance-Quality Control Program for any onsite field measurements such as pH, turbidity, temperature and residual chlorine. A manual containing the steps followed in this program must be kept onsite and shall be available for inspection by Regional Water Board staff. The Discharger must demonstrate sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform these field measurements. The Quality Assurance-Quality Control Program must conform to USEPA guidelines or to procedures approved by the Regional Water Board.

E. Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary, at least yearly, to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once per year to ensure continued accuracy of the devices.

F. Monitoring results, including noncompliance, shall be reported at intervals and in a manner specified in this Monitoring and Reporting Program.

G. Laboratories analyzing monitoring samples shall be certified by DPH, in accordance with the provision of CWC section 13176, and must include quality assurance/quality control data with their reports.

H. 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.

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

J. 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.

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	A location where a representative sample of the influent into the Facility can be collected prior to any plant return flows or treatment processes.
001	EFF-001	Effluent automatic sampler is located at the end of the UV disinfection channel. [Latitude: 38° 10’ 06” N; Longitude: 121° 40’ 42”W]
--	BIO-001	A location where a representative sample of biosolids can be collected.

Discharge Point Name	Monitoring Location Name	Monitoring Location Description
--	RSW-001	Approximately 250 feet upstream and 80 feet offshore of Discharge Point No. 001 of the diffuser (Latitude: 38° 10' 06"N; Longitude: 121° 40' 42"W)
--	RSW-002	Approximately 1 mile downstream and 80 feet offshore of Discharge Point No. 001 near Hwy 12
--	PND-001	A location where a representative sample location for the emergency storage basin can be collected.
--	UVS-001	Ultraviolet disinfection system.
--	SPL-001	A location where a representative sample location for the municipal water supply can be collected. If the water supply is from more than one source, a weighted average should be calculated.

III. INFLUENT MONITORING REQUIREMENTS

A. Monitoring Location INF-001

1. The Discharger shall monitor influent to the 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	[1]
Biochemical Oxygen Demand (5-day @20°C)	mg/L, lbs/day	24-Hour Composite[3]	1/Week	[1]
Total Suspended Solids	mg/L, lbs/day	24-Hour Composite[3]	1/Week	[1]
pH	Standard Units	Meter	1/Week	[1]
Temperature	°C(°F)	Grab	1/Week	[1]
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/Quarter[2]	[1]

1. Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136.
2. Sample in conjunction with municipal water supply sampling for electrical conductivity.
3. 24-hour flow proportional composite.
4. Influent monitoring site is located at ground level under the stairway that leads from the headworks area up to the anoxic basin. Sample is pulled from one or both of the vertical sections of the influent flow pipe (10-inc and/or 14-inch diameter). Grab samples are collected from a small mixing well located next to the automatic sampler used for composite samples.

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Location EFF-001

1. The Discharger shall monitor tertiary treated effluent at EFF-001 as follows. If more than one analytical test method is listed for a given parameter, the Discharger must select from the listed methods and corresponding Minimum Level:

Table E-3. Effluent Monitoring

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	mgd	Meter	Continuous	[1]
Conventional Pollutants				
Biochemical Oxygen Demand (BOD) (5-day @ 20 Deg. C)	mg/L	24-hr Composite[10]	1/Week	[1]
	lbs/day	Calculate		[1]
pH	Standard units	Meter	Continuous	[1,9]
Temperature	°C(°F)	Grab	5/week	[1,9]
Total Suspended Solids	mg/L	24-hr Composite[10]	1/Week	[1]
Priority Pollutants				
1,2-Diphenylhydrazine	µg/L	Grab	1/Quarter	[1,3]
Bis (2-ethylhexyl) phthalate	µg/L	Grab	1/Quarter	[1,2,3]
Copper, Total Recoverable	µg/L	24-hr Composite[10]	1/Quarter	[1,3]
Mercury, Total Recoverable	ng/L	Grab	1/Quarter	[1,3,8,9]
Mercury (methyl)	ng/L	Grab	1/Quarter	[1,3,8,9]
Non-Conventional Pollutants				
Aluminum, Total Recoverable	µg/L	24-hr Composite[10]	1/Quarter	[1,5]
Ammonia Nitrogen, Total (as N)	mg/L	Grab	1/Quarter[6,7]	[1]
Chloride	mg/L	24-hr Composite[10]	1/Quarter	[1]
Chlorine, Total Residual	mg/L	Grab	Daily during use	[1,4]
Dissolved Oxygen	mg/L	Grab	1/Week	[1, 11]
Electrical Conductivity @ 25°C	µmhos/cm	24-hr Composite[10]	1/Month	[1]
Hardness (as $CaCO_3$)	mg/L	24-hr Composite[10]	1/Month	[1]
Iron, Total Recoverable	µg/L	24-hr Composite[10]	1/Quarter	[1]
Nitrate + Nitrite (as Nitrogen)	mg/L	Grab	1/Quarter	[1]
Oil & Grease	mg/L lbs/day	Grab	1/Quarter	[1]
Settleable Solids	ml/L	Grab	1/Quarter	[1]
Total Coliform Organisms	MPN/100mL	Grab	1/Week	[1, 12]
Total Dissolved Solids	mg/L	24-hour composite[10]	1/Quarter	[1]
Turbidity	NTU	Meter	Continuous	[1,13, 14]

1. Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136.
2. In order to verify if bis (2-ethylhexyl) phthalate is truly present in the effluent discharge, the Discharger

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method

shall take steps to assure that sample containers, sampling apparatus, and analytical equipment are not sources of the detected contaminant.

3. 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.
4. Total chlorine residual must be monitored with a method sensitive to and accurate at a level of 0.01 mg/L.
5. Compliance with the final effluent limitations for aluminum can be demonstrated using either total or acid-soluble (inductively coupled plasma/atomic emission spectrometry or inductively coupled plasma/mass spectrometry) analysis methods, as supported by USEPA's Ambient Water Quality Criteria for Aluminum document (EPA 440/5-86-008), or other standard methods that exclude aluminum silicate particles as approved by the Executive Officer.
6. Concurrent with whole effluent toxicity monitoring.
7. pH and temperature shall be recorded at the time of ammonia sample collection.
8. Unfiltered methyl mercury and total mercury samples shall be taken using clean hands/dirty hands procedures, as described in U.S. EPA method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels, for collection of equipment blanks (section 9.4.4.2), and shall be analyzed by U.S. EPA method 1630/1631 (Revision E) with a method detection limit of 0.02 ng/l for methylmercury and 0.2 ng/l for total mercury.
9. Hardness, pH, and temperature data shall be collected at the same time and on the same date.
10. 24-hour flow proportional composite.
11. Dissolved oxygen sample is collected at the upstream location in the final effluent pump wet well.
12. Total coliform sample is collected six feet downstream from the UV lights.
13. Report daily average turbidity and maximum. If the turbidity exceeds 1 NTU, collect a sample for total coliform organisms and report the duration of the turbidity exceedance.
14. Turbidity monitoring requirement effective 120 days after adoption of Order to allow the Discharger time to install the necessary monitoring equipment.

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 quarterly acute toxicity testing, concurrent with effluent ammonia sampling.

2. *Sample Types* – For static non-renewal and static renewal testing, the samples shall be grab samples and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at the effluent monitoring location EFF-001.

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.

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 annual 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 this Monitoring and Reporting Program.

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

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

   - 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* – The chronic toxicity testing shall be performed using the dilution series identified in the table, below. The receiving water control shall be used as the diluent (unless the receiving water is toxic).

Table E-4. Chronic Toxicity Testing Dilution Series

Sample	Dilutions (%)					Controls	
	50	25	12.5	6.25	3.125	Receiving Water	Laboratory Water
% Effluent	50	25	12.5	6.25	3.125	0	0
% Receiving Water	50	75	87.5	93.75	96.875	100	0
% Laboratory Water	0	0	0	0	0	0	100

8. *Test Failure* – The Discharger must re-sample and re-test as soon as possible, but no later than fourteen (14) days after receiving notification of a test failure. A test failure is defined as follows:

a. The reference toxicant test or the effluent test does not meet all test acceptability criteria as specified in the *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition*, EPA/821-R-02-013, October 2002 (Method Manual), and its subsequent amendments or revisions; or

b. The percent minimum significant difference (PMSD) measured for the test exceeds the upper PMSD bound variability criterion in Table 6 on page 52 of the Method Manual. (A retest is only required in this case if the test results do not exceed the monitoring trigger specified in the Special Provision at section VI.2.a.iii. of the Order.)

C. WET Testing Notification Requirements. The Discharger shall notify the Regional Water Board within 24-hours after the receipt of test results exceeding the monitoring trigger during regular or accelerated monitoring, or an exceedance of the acute toxicity effluent limitation.

D. WET Testing Reporting Requirements. All toxicity test reports shall include the contracting laboratory's complete report provided to the Discharger and shall be in accordance with the appropriate "Report Preparation and Test Review" sections of the method manuals. 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/LC50, 100/EC25, 100/IC25, and 100/IC50, 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 Toxicity Reduction Evaluation (TRE).

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

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

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

   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

A. Monitoring Location RSW-001 and RSW-002

1. The Discharger shall monitor the Sacramento River at RSW-001 and RSW-002 as follows:

Table E-5. Receiving Water Monitoring Requirements, RSW-001 and RSW-002

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow[1]	Flow Direction	Visual Inspection	When monitoring is conducted	--
pH[2]	Standard Units	Grab	1/Quarter	[3]
Dissolved Oxygen	mg/L	Grab	1/Quarter	[3]
Temperature[2]	°C(°F)	Grab	1/Quarter	[3]
Turbidity	Neophelometric	Grab	1/Quarter	[3]

	Turbity Units			
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/Quarter	[3]
Hardness (as $CaCO_3$)	mg/L	Grab	1/Quarter [5]	

1. Shall report Sacramento River flow direction at the time of sampling.
2. Monitoring for pH and temperature shall be conducted concurrently with ammonia sampling.
3. Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136. For priority pollutants, the methods must meet the lowest minimum levels (MLs) specified in Appendix 4 of the SIP, where no methods are specified for a given pollutant, by methods approved by this Regional Water Board or the State Water Board.
4. Priority pollutants shall be sampled quarterly during the third year following the date of permit adoption and shall be conducted concurrently with effluent monitoring for priority pollutants, hardness (as $CaCO_3$), and pH.
5. Samples shall be monitored on the same day as the effluent monitoring samples.

IX. OTHER MONITORING REQUIREMENTS

A. Biosolids

1. Monitoring Location BIO-001

a. A composite sample of sludge shall be collected annually at Monitoring Location BIO-001 in accordance with EPA's *POTW Sludge Sampling and Analysis Guidance Document*, August 1989, and tested for priority pollutants listed in 40 CFR Part 122, Appendix D, Tables II and III (excluding total phenols).

b. A composite sample of sludge shall be collected annually at Monitoring Location BIO-001 in accordance with USEPA's *POTW Sludge Sampling and Analysis Guidance Document*, August 1989, and tested for the metals listed in Title 22.

c. Sampling records shall be retained for a minimum of 5 years. A log shall be maintained of sludge quantities generated and of handling and disposal activities. The frequency of entries is discretionary; however, the log must be complete enough to serve as a basis for part of the annual report.

d. Upon removal of sludge, the Discharger shall submit characterization of sludge quality, including sludge percent solids and the most recent quantitative results of chemical analysis for the priority pollutants listed in 40 CFR Part 122, Appendix D, Tables II and III (excluding total phenols). In addition to USEPA's POTW *Sludge Sampling and Analysis Guidance Document*, August 1989, suggested methods for analysis of sludge are provided in USEPA publications titled *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* and *Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater*. Recommended analytical holding times for sludge samples should reflect those specified in 40 CFR 136.6.3(e). Other guidance is available.

B. Emergency Storage Basin Monitoring Location

1. Monitoring Location PND-001

a. The Discharger shall keep a log related to the use of the basin. In particular the Discharger shall record the following when any type of wastewater is directed to the basin;

- The date(s) when the wastewater is directed to the basin;
- The type(s) of wastewater (e.g., untreated due to plant upset, tertiary treated) directed to the basin;
- The total volume of wastewater directed to the basin[1];
- The duration of time wastewater is collected in the basin; prior to redirection back to the wastewater treatment plant; and
- The date when all wastewater in the basin has been redirected to the wastewater treatment plant.
- The freeboard available in the basin.

b. The basin log shall be submitted with the monthly self-monitoring reports required in Section X.B of the Monitoring and Reporting Program (Attachment E).

C. Ultraviolet (UV) Disinfection System

1. Monitoring Location UVS-001

a. The Discharger shall monitor the UV disinfection system at UVS-001 as follows:

Table E-6. Ultraviolet Disinfection System Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow rate	mgd	Meter	Continuous[1]	
Number of UV banks in operation	Number	Meter	Continuous[1]	
UV Transmittance	Percent (%)	Meter	Continuous[1]	
UV Power Setting	Percent (%)	Meter	Continuous[1]	
UV Dose[2]	mJ/cm^2	Calculated	Continuous[1]	

[1] The total volume of wastewater directed to the basin may be estimated. This requirement is effective 120 days after adoption of this Order to allow the Discharger time to install necessary equipment.

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method

[1] For continuous analyzers, the Discharger shall report documented routine meter maintenance activities, including date, time of day, and duration, in which the analyzer(s) is not in operation.

[2] Report daily minimum UV dose, daily average UV dose, and weekly average UV dose. For the daily minimum UV dose, also report associated number of banks, gallons per minute per lamp, power settings, and UV transmittance used in the calculation. If effluent discharge has received less than the minimum UV dose and is not diverted from discharging, report the duration and dose calculation variables with each incident.

D. 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. Municipal water supply samples shall be collected at approximately the same time as effluent samples.

Table E-7. 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	[3]
Electrical Conductivity @ 25 °C[1,4]	µmhos/cm	Grab	1/Quarter	[3]
Standard Minerals[2]	mg/L	Grab	1/Year	[3]

[1] If the water supply is from more than one source, the total dissolved solids and electrical conductivity shall be reported as a weighted average and include copies of supporting calculations.

[2] Standard minerals shall include all major cations and anions and include verification that the analysis is complete (i.e., cation/anion balance).

[3] Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136.

[4] Sample in conjunction with influent sampling for electrical conductivity.

E. Effluent and Receiving Water Characterization Study

An effluent and receiving water monitoring study is required to ensure adequate information is available for the next permit renewal. During the third year of this permit term, the Discharger shall conduct quarterly monitoring of the effluent at EFF-001 and of the receiving water at RSW-001 for all priority pollutants and other constituents of concern as described in Attachment H. Dioxin and Furan sampling shall be performed only twice during the year, as described in Attachment I. The report shall be completed in conformance with the following schedule.

Task	Compliance Date
i. Submit Work Plan and Time Schedule	No later than 18 months from adoption of this Order
ii. Conduct quarterly[1] monitoring	During third or fourth year of permit term
iii. Submit Final Report	6 months following completion of final monitoring event

[1] Dioxin and Furan sampling shall be performed only twice during the year, as described in Attachment I.

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.

B. Self Monitoring Reports (SMRs)

1. At any time during the term of this permit, the State Water Board or the 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. The Discharger shall report in the SMR the results for all monitoring specified in this Monitoring and Reporting Program under sections III through IX. The Discharger shall submit monthly SMRs including the results of all required monitoring using

USEPA-approved test methods or other test methods specified in this Order. If the Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.

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

Table E-8. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On…	Monitoring Period	SMR Due Date
Continuous	First day of the calendar month following the permit effective date	All	Submit with monthly SMR
1/Day	First day of the calendar month following the permit effective date	Any 24-hour period that reasonably represents a calendar day for purposes of sampling.	Submit with monthly SMR
1/Week	First Sunday of the calendar month following the permit effective date	Sunday through Saturday	Submit with monthly SMR
1/Month	First day of calendar month following permit effective date	First day of calendar month through last day of calendar month	Submit with monthly SMR
1/Quarter	Closest of 1 January, 1 April, 1 July, or 1 October following (or on) permit effective date	1 January through 31 March 1 April through 30 June 1 July through 30 September 1 October through 31 December	1st day of second month after end of the monitoring period
1/Year	1 January following (or on) permit effective date	1 January through 31 December	1st day of the second month after end of the monitoring period

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

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

a. Sample results greater than or equal to the reported ML 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.

5. Compliance Determination. Compliance with effluent limitations for priority pollutants shall be determined using sample reporting protocols defined above and in Attachment A of this Order. For purposes of reporting and administrative enforcement by the Regional Water Board and the State Water Board, the Discharger shall be deemed out of compliance with effluent limitations if the concentration of the priority pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reporting level (RL).

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.

7. The Discharger shall submit SMRs in accordance with the following requirements:

a. The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with interim and/or final effluent limitations. The Discharger is not required to duplicate the submittal of data that is entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment.

b. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify violations of the WDRs; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.

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

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

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 Water Board 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 Discharger shall submit the original DMR and one copy of the DMR to the address listed below:

STANDARD MAIL	FEDEX/UPS/ OTHER PRIVATE CARRIERS
State Water Resources Control Board Division of Water Quality c/o DMR Processing Center PO Box 100 Sacramento, CA 95812-1000	State Water Resources Control Board Division of Water Quality c/o DMR Processing Center 1001 I Street, 15th Floor Sacramento, CA 95814

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 will not be accepted unless they follow the exact same format of EPA Form 3320-1.

D. Other Reports

1. Progress Reports. As specified in the compliance time schedules required in the Special Provisions contained in section VI of the Order, 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-9. Reporting Requirements for Special Provisions Progress Reports

Special Provision	Reporting Requirements
Salinity Evaluation and Minimization Plan (Special Provisions VI.C.3.b)	**1 June**, annually, after approval of plan
Pollution Prevention Plan for Mercury (Special Provisions VI.C.3.a)	**1 June**, annually, after approval of work plan

2. The Discharger shall report the results of any special studies, acute and chronic toxicity testing, TRE/TIE, PMP, and Pollution Prevention Plan required by Special Provisions VI.C.2 and 3 of this Order. The Discharger shall report the progress in satisfaction of compliance schedule dates specified in the Special Provision at section VI.C.7 of this Order. The Discharger shall submit reports with the first monthly SMR scheduled to be submitted on or immediately following the report due date.

3. Minimum Levels, Method Detection Limits, and Analytical Methods Report. 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 SIP.

4. 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.

5. 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.

ATTACHMENT F – FACT SHEET

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ATTACHMENT F – FACT SHEET

As described in the Findings 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	5A480108001
Discharger	City of Rio Vista
Name of Facility	Northwest Wastewater Treatment Facility
Facility Address	3000 Airport Road
	Rio Vista, CA 94571
	Solano County
Facility Contact, Title and Phone	Public Works Director/City Manager, (707) 374-6747
Authorized Person to Sign and Submit Reports	Public Works Director/City Manager, (707) 374-6747
Mailing Address	Same as Facility Address
Billing Address	Same as Facility Address
Type of Facility	POTW
Major or Minor Facility	Major
Threat to Water Quality	2
Complexity	B
Pretreatment Program	N
Reclamation Requirements	
Facility Permitted Flow	1.0 million gallons per day (mgd) average dry weather flow (ADWF)
Facility Design Flow	1.0 mgd (ADWF)
Watershed	Sacramento River
Receiving Water	Sacramento River
Receiving Water Type	Sacramento-San Joaquin Delta

A. Veolia Water West Operating Services Inc. is the operator of Northwest Wastewater Treatment Facility (hereinafter referred to as Facility). City of Rio Vista owns the property at 3000 Airport Road on which the Facility is located. City of Rio Vista is hereinafter referred to as Discharger.

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 tertiary level treated wastewater to the Sacramento River, within the Sacramento – San Joaquin Delta, a water of the United States, and is currently regulated by Order No. R5-2004-0092 which was adopted on 9 July 2004 and expired on 1 July 2009. The terms and conditions of the current Order have been automatically continued and remain in effect until new Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (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 WDRs and NPDES permit on 16 March 2009. Supplemental information was requested on 22 April 2009 and received on 21 May 2009. A site visit was conducted on 12 May 2009, to observe operations and collect additional data to develop permit limitations and conditions.

II. FACILITY DESCRIPTION

The Discharger provides sewerage service to a small development northwest of the City of Rio Vista and serves a population of approximately 3,400. The design daily average flow capacity of the Facility is 1.0 million gallons per day (mgd).

A. Description of Wastewater and Biosolids Treatment or Controls

The Facility consists of fine screening followed by activated sludge treatment with anoxic and aerobic basins, followed by membrane biological reactors (MBR) which separate the liquid from the solids. The liquid effluent from the MBRs is disinfected using ultraviolet light (UV) disinfection. Sludge is dewatered using belt filter press technology followed by drying in solar greenhouses. Once dried, the material meets “Exceptional Class A” biosolids criteria and is being stockpiled in one of the solar greenhouses prior to disposal at a regulated Class III landfill or beneficial land application. A 2 million gallon emergency storage basin lined with high density polyethylene liner is also used to accommodate flows in excess of the peak hydraulic capacity of 3 MGD. However due to the slow down in population growth, the treatment plant receives approximately 20% of the design flow (e.g., 0.20 mgd) and the emergency storage basin is used for storage of treated and untreated wastewater when there are operational failures at the headworks or if effluent fails to meet standards. When the treatment system is brought back up from an operational or treatment failure, the wastewater in the emergency storage basin is routed back through the treatment system. Treated effluent is pumped through approximately 2 miles of pipeline and discharged through a multi-port outfall diffuser approximately 200 feet offshore into the Sacramento River on a year round basis. Effluent flow monitoring data during the previous term recorded the highest daily flow of 0.57 mgd.

B. Discharge Points and Receiving Waters

1. The Facility is located in Section 13, T4N, R3E, MDB&M, as shown in Attachment B, a part of this Order.

2. Tertiary treated municipal wastewater is discharged at Discharge Point No. 001 to the Sacramento River, a water of the United States at a point latitude 38° 10' 06" N and longitude 121° 40' 42" W.

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

Effluent limitations contained in Order No. R5-2004-0092 for discharges from Discharge Point No. 002 and representative monitoring data from the term of Order No. R5-2004-0092 are as follows:

Table F-2. Historic Effluent Limitations and Monitoring Data

Parameter	Units	Effluent Limitation			Monitoring Data (From August 2006 To January 2009)		
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge
Biochemical Oxygen Demand, 5-day @ 20 °C (BOD_5)[1]	mg/l	10	--	20	5	7	8
	lbs/day[2]	83	--	167	6.4	26	7
Total Suspended Solids (TSS)[1]	mg/l	10	--	20	3	4.5	4.5
	lbs/day[2]	83	--	167	4	6.4	6.4
Total Coliform	MPN/ 100 mL	--	23[3]	500	234	801	1600
Settleable Solids	ml/L	0.1	--	0.2	<0.1	<0.1	<0.1
Chlorine Residual	mg/l		0.011[4]	0.019[5]	<0.01	<0.01	<0.01
	lbs/day[2]		0.092[4]	0.16[5]	<0.6	<0.6	<0.6
Oil & Grease	mg/l	10	--	15	--	--	6
	lbs/day[2]	83	--	167	--	--	10
Aluminum	µg/l	71	--	142	--	--	100
	lbs/day[2]	0.59	--	1.2	--	--	0.17
Bis (2-ethylhexyl) phthalate	µg/l	6.5	--	13	--	--	ND
	lbs/day[2]	0.054	--	0.11	--	--	--
Copper[6]	µg/l	Variable	--	Variable	--	--	18
	lbs/day[2]	Calculate	--	Calculate	--	--	0.027
Chloride	mg/l	340	--	--	260	--	260
	lbs/day[2]	2835	--	--	534	--	534
Chloroform	µg/l	15	--	31	--	--	ND
	lbs/day[2]	0.13	--	0.26	--	--	--
Chlorodibromomethane	µg/l	5.3	--	11	--	--	ND
	lbs/day[2]	0.044	--	0.092	--	--	--

Parameter	Units	Effluent Limitation			Monitoring Data (From August 2006 To January 2009)		
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge
Cyanide	µg/l	9.5	--	19	--	--	3
	lbs/day[2]	0.079	--	0.16	--	--	0.0066
Dichlorobromomethane	µg/l	12	--	24	--	--	ND
	lbs/day[2]	0.10	--	0.020	--	--	--
1,2-Diphenylhydrazine	µg/l	0.70	--	1.4	--	--	<5
	lbs/day[2]	0.0058	--	0.012	--	--	0.006
Electrical Conductivity (EC)	µmhos/cm	2,166	--	--	1,600	--	1,600
Iron	µg/l	300	--	--	--	--	200
	lbs/day[2]	2.5	--	--	--	--	0.1
Manganese	µg/l	50	--	--	--	--	11
	lbs/day[2]	0.42	--	--	--	--	0.01
Foaming Agents (MBAS)	µg/l	3559	--	--	--	--	0.10
	lbs/day[2]	30	--	--	--	--	0.0002
Nitrite	mg/l	5.6	--	--	--	--	2
	lbs/day[2]	47	--	--	--	--	0.003
303 (d) Pesticides[7]	µg/l	--	--	ND	--	--	ND
	lbs/day[2]	--	--	0.0	--	--	0.0

1. To be ascertained by a 24-hour composite.
2. Based on an average dry weather flow of 1 mgd.
3. 7-day median.
4. 4-day average.
5. 1-hour maximum.
6. Full compliance with this limit is not required by this Order until 1 July 2009.
7. Each organochlorine pesticide shall be ND (non-detectable). Organochlorine pesticides include aldrin, chlordane, 4, 4'DDT, dieldrin, endosulfan (alpha, beta, sulfate), endrin, endrin aldehyde, heptachlor, heptachlor epoxide, hexacyclohexane (alpha, beta, delta, and lindane), and toxaphene.

D. Compliance Summary

The following compliance summary applies to the Facility during the term of Order No. R5-2004-0092 (NPDES Permit No. CA0083771).

1. Administrative Civil Liability (ACL) Order No. R5-2008-0525 assessed mandatory penalties for violations of Waste Discharge Requirements Order Nos. R5-2002-0099 and R5-2004-0092 (NPDES No. CA0083771) in the amount of $1,005,000. The ACL Order considered payment of the penalty satisfied through the completion of the engineering design, environmental review, land acquisition, treatment plant construction, and outfall construction for the new Northwest Wastewater Treatment Facility.

2. Based on the data contained in self-monitoring reports from 25 April 2008 to 9 April 2009, the Facility exceeded aluminum, pH, and total coliform effluent limitations.

E. Planned Changes

No changes are planned for the Facility.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in this Order are based on the applicable plans, policies, and regulations identified in the Findings in section II of this Order. The applicable plans, policies, and regulations relevant to the discharge include the following:

A. Legal Authorities

This Order is issued pursuant to regulations in the Clean Water Act (CWA) and the California Water Code (CWC) as specified in the Finding contained at section II.C of this Order.

B. California Environmental Quality Act (CEQA)

This Order meets the requirements of CEQA as specified in the Finding contained at section II.E of this Order.

C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plans.** This Order implements the following water quality control plans as specified in the Finding contained at section II.H of this Order.

   a. *Water Quality Control Plan, Fourth Edition (Revised February 2007), for the Sacramento and San Joaquin River Basins* (Basin Plan)

   b. *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California* (Thermal Plan)

   This plan contains temperature objectives for surface waters. Since the Facility discharges to the Sacramento – San Joaquin Delta, the Thermal Plan is applicable to the discharge. Requirements of this Order implement the Thermal Plan**.**

   c. *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan)

   The Bay-Delta Plan identifies the beneficial uses of the estuary and includes objectives for flow, salinity, and endangered species protection. The Bay-Delta attempts to create a management plan that is acceptable to the stakeholders while at the same time is protective of beneficial uses.

2. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** This Order implements the NTR and CTR as specified in the Finding contained at section II.I of this Order.

3. **State Implementation Policy (SIP).** This Order implements the SIP as specified in the Finding contained at section II.I of this Order.

4. **Alaska Rule.** This Order is consistent with the Alaska Rule as specified in the Finding contained at section II.L of this Order.

5. **Antidegradation Policy.** As specified in the Finding contained at section II.N of this Order and 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 Resources Control Board (State Water Board) Resolution 68-16.

6. **Anti-Backsliding Requirements.** This Order is consistent with anti-backsliding policies as specified in the Finding contained at section II.M of this Order. Compliance with the anti-backsliding requirements is discussed in the Fact Sheet (Attachment F, Section IV.D.3).

7. **Emergency Planning and Community Right to Know Act**

   Section 13263.6(a) of the CWC, 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) (EPCRA) 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 most recent toxic chemical data report does not indicate any reportable off-site releases or discharges to the collection system for this Facility. Therefore, a reasonable potential analysis based on information from EPCRA cannot be conducted. Based on information from EPCRA, there is no reasonable potential to cause or contribute to an excursion above any numeric water quality objectives included within the Basin Plan or in any State Water Board plan, so no effluent limitations are included in this permit pursuant to CWC section 13263.6(a).

   However, as detailed elsewhere in this Order, available effluent data indicate that there are constituents present in the effluent that have a reasonable potential to cause or contribute to exceedances of water quality standards and require inclusion of effluent limitations based on federal and state laws and regulations.

8. **Storm Water Requirements**

   USEPA promulgated federal regulations for storm water on 16 November 1990 in 40 CFR Parts 122, 123, and 124. The NPDES Industrial Storm Water Program regulates storm water discharges from wastewater treatment facilities. Wastewater

treatment plants are applicable industries under the storm water program and are obligated to comply with the federal regulations.

9. **Endangered Species Act.** This Order is consistent with the Endangered Species Act as specified in the Finding contained at section II.P of this Order.

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

1. Under section 303(d) of the 1972 CWA, states, territories, and authorized tribes are required to develop lists of water quality limited segments. The waters on these lists do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. On 30 November 2006 USEPA gave final approval to California's 2006 section 303(d) List of Water Quality Limited Segments. The Basin Plan references this list of Water Quality Limited Segments (WQLSs), which are defined as "…*those sections of lakes, streams, rivers or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate limitations for point sources* (40 CFR Part 130, et seq.)." The Basin Plan also states, "*Additional treatment beyond minimum federal standards will be imposed on dischargers to [WQLSs]. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment*." The listing for Delta Waterways (western portion) includes: chlorpyrifos, DDT, diazinon, electrical conductivity, exotic species, group A pesticides, mercury, and unknown toxicity.

2. **Total Maximum Daily Loads (TMDLs).** USEPA requires the Regional Water Board to develop TMDLs for each 303(d) listed pollutant and water body combination. TMDLs for the Sacramento – San Joaquin Delta are currently being developed for diazinon, chlorpyrifos, and mercury. This Order may be reopened to apply applicable water quality-based effluent limitations upon the completion of these TMDLs.

3. The 303(d) listings and TMDLs have been considered in the development of the Order. A pollutant-by-pollutant evaluation of each pollutant of concern is described in section VI.C.3 of this Fact Sheet.

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 CWA and amendments thereto are applicable to the discharge.

The CWA mandates the implementation of effluent limitations that are as stringent as necessary to meet water quality standards established pursuant to state or federal law [33 U.S.C., §1311(b)(1)(C); 40 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 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 dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations in the Code of Federal Regulations: 40 CFR 122.44(a) requires that permits include applicable technology-based limitations and standards; and 40 CFR 122.44(d) requires that permits include WQBELs to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water where numeric water quality objectives have not been established. The Basin Plan at page IV-17.00 [for discharges in the Sac/SJ Basins, 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) USEPA's published water quality criteria, (2) a proposed state criterion (i.e., water quality objective) or an explicit state policy interpreting its narrative water quality criteria (i.e., the 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 includes numeric site-specific water quality objectives and narrative objectives for toxicity, chemical constituents, discoloration, radionuclides, and tastes and odors. The narrative toxicity objective states: "*All waters shall be maintained free of toxic*

substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life." (Basin Plan at III-8.00.) The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. The narrative chemical constituents objective states that waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At minimum, "…*water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)" in Title 22 of CCR.* The Basin Plan further states that, to protect all beneficial uses, the Regional Water Board may apply limits more stringent than MCLs. The narrative tastes and odors objective states: *"Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses*."

A. Discharge Prohibitions

1. 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

Section 301(b) of the CWA and implementing USEPA permit regulations at 40 CFR 122.44 require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards. The discharge authorized by this Order must meet minimum federal technology-based requirements based on Secondary Treatment Standards at 40 CFR Part 133 and Best Professional Judgment (BPJ) in accordance with 40 CFR 125.3.

Regulations promulgated in 40 CFR 125.3(a)(1) require technology-based effluent limitations for municipal Dischargers to be placed in NPDES permits based on Secondary Treatment Standards or Equivalent to Secondary Treatment Standards.

The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) established the minimum performance requirements for POTWs [defined in section 304(d)(1)]. Section 301(b)(1)(B) of that Act requires that such treatment works must,

as a minimum, meet effluent limitations based on secondary treatment as defined by the USEPA Administrator.

Based on this statutory requirement, USEPA developed secondary treatment regulations, which are specified in 40 CFR Part 133. These technology-based regulations apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by secondary treatment in terms of 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH.

2. Applicable Technology-Based Effluent Limitations

a. BOD_5 and TSS. 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. Tertiary treatment is necessary to protect the beneficial uses of the receiving stream and the final effluent limitations for BOD_5 and TSS are based on the technical capability of the tertiary process. BOD_5 is a measure of the amount of oxygen used in the biochemical oxidation of organic matter. The secondary and tertiary 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 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 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 the Order to ensure that the treatment works are not organically overloaded and operate in accordance with design capabilities. In addition, 40 CFR 133.102, in describing the minimum level of effluent quality attainable by secondary 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 treatment plant, it must also be achieved by a tertiary (i.e., treatment beyond secondary level) treatment plant. This Order contains a limitation requiring an average of 85 percent removal of BOD_5 and TSS over each calendar month.

b. Flow. The Facility was designed to provide a tertiary level of treatment for up an average dry weather flow of 1.0 mgd and a peak wet weather flow of 3.0 mgd. Therefore, this Order contains an average dry weather discharge flow effluent limit of 1.0 mgd.

c. pH. The secondary treatment regulations at 40 CFR Part 133 also require that pH be maintained between 6.0 and 9.0 standard units.

Summary of Technology-based Effluent Limitations
Discharge Point No. 001

Table F-3. Summary of Technology-based Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Flow	mgd	--	--	1.0	--	--
Biochemical Oxygen Demand, 5-day @ 20 °C (BOD_5)[1]	mg/L	10	15	20		
	lbs/day[2]	83	125	167	--	--
Total Suspended Solids (TSS) [1]	mg/L	10	15	20	--	--
	lbs/day[2]	83	125	167	--	--
pH	Standard Units	--	--	--	6.0[3]	9.0[3]

1. The average monthly percent removal of BOD 5-day20°C and total suspended solids shall not be less than 85 percent.
2. Based on a design average dry weather flow capacity of 1.0 mgd.
3. More stringent water quality-based effluent limitations for pH are applied in this Order.

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

Section 301(b) of the CWA and 40 CFR 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, more stringent than secondary treatment requirements that are necessary to meet applicable water quality standards. The rationale for these requirements is discussed in the Fact Sheet.

40 CFR 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, WQBELs must be established using: (1) USEPA 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 122.44(d)(1)(vi).

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

The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. In addition, the Basin Plan implements State Water Board Resolution 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. The beneficial uses of the Sacramento River within the Sacramento-San Joaquin Delta downstream of the discharge are municipal and domestic supply, agricultural irrigation, agricultural stock watering, industrial process supply, industrial service water, water contact recreation, other non-contact water recreation, warm freshwater habitat, cold freshwater habitat, migration of aquatic organisms (cold and warm), warm spawning habitat, wildlife habitat, and navigation.

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.

a. Receiving Water and Beneficial Uses. Sacramento River within the Sacramento-San Joaquin Delta

Beneficial uses applicable to the Sacramento River within the Sacramento-San Joaquin Delta are as follows:

Table F-4. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	**Sacramento River within the Sacramento-San Joaquin Delta**	Municipal and domestic supply (MUN); agricultural irrigation, agricultural stock watering (AGR); industrial process supply (PROC); industrial service supply (IND); water contact recreation, including canoeing and rafting (REC-1); other non-contact water recreation (REC-2); warm freshwater habitat (WARM); cold freshwater habitat (COLD); migration of aquatic organisms, warm and cold (MIGR); warm spawning habitat (SPWN); wildlife habitat (WILD); and navigation (NAV).

b. **Effluent and Ambient Background Data.** The reasonable potential analysis (RPA), as described in section IV.C.3 of this Fact Sheet, was based on effluent data from August 2006 through January 2009 data submitted in the Discharger's monthly self-monitoring reports and ambient background data from January 2002 to December 2002. Effluent data submitted in the Discharger's monthly self monitoring reports from August 2004 to July 2006 was not used in the RPA since that data did not characterize the effluent discharged by the new Facility which went into operation in August 2006.

c. **Hardness-Dependant CTR Metals Criteria.** 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 metals with hardness-dependant criteria include cadmium, copper, chromium III, lead, nickel, silver, and zinc.

This Order has established the criteria for hardness-dependant metals based on the reasonable worst-case ambient hardness as required by the SIP[1], the CTR[2], and State Water Board Order No. WQO 2008-008 (City of Davis). The SIP and the CTR require the use of "receiving water" or "actual ambient" hardness, respectively, to determine the effluent limitations for these metals. (SIP § 1.2; 40 CFR § 131.38(c)(4), Table 4, note 4.) The CTR does not define whether the term "ambient," as applied in the regulations, necessarily requires the consideration of upstream as opposed to downstream hardness conditions. Therefore, where reliable, representative data are available, the hardness value for calculating criteria can be the downstream receiving water hardness, after mixing with the effluent (Order WQO 2008-0008, p. 11). The Regional Water Board thus has considerable discretion in determining ambient hardness (*Id.*, p.10.).

[1] The SIP does not address how to determine the hardness for application to the equations for the protection of aquatic life when using hardness-dependant metals criteria. It simply states, in Section 1.2, that the criteria shall be properly adjusted for hardness using the hardness of the receiving water.

[2] The CTR requires that, for waters with a hardness of 400 mg/L (as $CaCO_3$), or less, the actual ambient hardness of the surface water must be used. It further requires that the hardness values used must be consistent with the design discharge conditions for design flows and mixing zones.

The hardness values must also be protective under all flow conditions (*Id.*, pp. 10-11).

The equation describing the total recoverable regulatory criterion[3], as established in the CTR, is as follows:

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

Where:

H = hardness (as $CaCO_3$)
WER = water-effect ratio
m, b = metal- and criterion-specific constants

In this site-specific case, there is dilution available for compliance with acute and chronic aquatic life criteria. This Order allows a dilution credit for acute and chronic aquatic life criteria of 20 (see subsection d, below, for discussion). This defines the point in the receiving water that must be in compliance with aquatic life criteria (i.e., edge of mixing zone). With a dilution credit of 20 the effluent fraction is 4.8% at the edge of the mixing zone.

The effluent hardness ranged from 100 mg/L to 130 mg/L (as $CaCO_3$), based on eight samples from October 2006 to October 2008. There is minimal hardness data for the upstream receiving water in the vicinity of the discharge. The Sacramento River hardness at Rio Vista varied from 58 mg/L to 94 mg/L (as $CaCO_3$), based on three samples from January 2002 to September 2002. Since there is only three hardness samples for the Sacramento River at Rio Vista, Sacramento River hardness data at Hood, which is 27.5 miles upstream of Rio Vista, was also evaluated using the Department of Water Resources' California Data Exchange Center (CDEC) database. The CDEC Sacramento River hardness at Hood ranged from 35 mg/L to 110 mg/L (as $CaCO_3$), based on 420 samples from August 1997 to February 2010. As shown in Attachment J, Figure F-1, the river hardness varies with the flow. During higher flows the hardness is lowest, while at critical low flows the range of hardness is higher. Since high flows in the river do not represent the critical receiving water flows, the hardness during lower flows were evaluated to determine the hardness under design low flow conditions as required by the CTR.

In State Water Board Order WQ 2008-0008 for the City of Davis Wastewater Treatment Plant, the issue of selecting the appropriate receiving water hardness considering all flow conditions was discussed. For the City of Davis, the receiving water hardness had the same relationship with river flows (i.e., higher river flows had lower hardness). The State Water Board found that in the case of the City of Davis using the hardness for only low flow conditions was not

[3] The default USEPA conversion factors contained in Appendix 3 of the SIP were used to convert the applicable dissolved criteria to total recoverable criteria.

protective of acute toxicity impacts during storm events, due to the short duration of the acute criterion. In the case of the City of Davis, however, a mixing zone was not allowed. For this Order, a mixing zone is allowed, so the conditions are not the same under which the State Water Board made its determination for the City of Davis. For this Order a zone of initial mixing is allowed where the acute criterion may be exceeded. Since the mixing zone was established based on critical low flows, using a low hardness value that is representative of high flows is not appropriate.

Evaluating the hardness when river flows were less than 10,000[4] cubic feet per second (cfs), the hardness ranged from 50 mg/L to 84 mg/L (as $CaCO_3$), based on 32 samples from September 1997 to January 2010, and averaged 63 mg/L (as $CaCO_3$). One hardness data point was found to be non-representative of the low flow conditions. The hardness data point on 1 October 2008 was reported as 36 mg/L (as $CaCO_3$), which was not characteristic of the other low flow hardness values. The hardness for data points thirty days before and after 1 October 2008 ranged from 50 to 72 mg/L (as $CaCO_3$). Furthermore, the alkalinity on 1 October 2008 was 61 mg/L (as $CaCO_3$), which is not characteristic of a hardness of 36 mg/L (as $CaCO_3$). The alkalinity for the other dates during this time period correlates well with hardness. The alkalinity (as $CaCO_3$) for the Sacramento River from August 1997 to February 2010 was on average 11% greater than the hardness (as $CaCO_3$). However, the alkalinity of 1 October 2008 was 69% greater than the hardness reported on that day. The alkalinity remained consistent for the data surrounding 1 October 2008, which puts into the question the validity of the hardness result. Therefore, in accordance with Section 1.2 of the SIP, based on best professional judgment, the hardness result for 1 October 2008 was not used in this evaluation.

When the effluent and receiving water are at their respective minimum observed hardness values (i.e. 100 mg/L and 50 mg/L as $CaCO_3$, respectively), and the effluent fraction is 4.8%, the mixed hardness can be estimated as 52 mg/L (as $CaCO_3$) using a simple mass balance to represent the downstream ambient hardness. However, the effluent hardness dataset is not sufficiently robust to ensure the minimum observed effluent hardness represents expected low hardness of the effluent. Therefore, the minimum upstream receiving water hardness of 50 mg/L as $CaCO_3$ has been used to calculate the CTR metals criteria for this Order. Should the Discharger collect additional effluent hardness data to support the use of a downstream mixed hardness, this Order may be reopened to adjust the CTR criteria for the hardness dependent metals.

[4] As discussed in Section IV.C.3.d.xiii.(b) of the Fact Sheet, the 1Q10 and 7Q10 flows are 5,100 and 5,800 cfs, respectively. Hardness values for river flows less than 10,000 cfs were used to capture the minimum hardness that occurs under design low flow conditions.

d. Assimilative Capacity/Mixing Zone

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 122.44 and 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 *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California* (State Implementation Policy or SIP) and the Basin Plan. If no procedure applies in the SIP or the Basin Plan, then the Regional Water Board may use the USEPA *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001)(TSD).

The allowance of mixing zones by the Regional Water Board is discussed in 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."*

Section 1.4.2 of the SIP states, in part, "…*with the exception of effluent limitations derived from TMDLs, in establishing and determining compliance with effluent limitations for applicable human health, acute aquatic life, or chronic aquatic life priority pollutant criteria/objectives or the toxicity objective for aquatic life protection in a basin plan, the Regional Board may grant mixing zones and dilution credits to dischargers…The applicable priority pollutant criteria and objectives are to be met through 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 Regional Board may consider allowing mixing zones and dilution credits only for discharges with a physically identifiable point of discharge that is regulated through an NPDES permit issued by the Regional Board*.

For completely-mixed discharges, the Regional Water Board may grant a mixing zone and apply a dilution credit in accordance with Section 1.4.2.1 of the SIP. For incompletely-mixed discharges, the Discharger must perform a mixing zone study to demonstrate to the Regional Water Board that a dilution credit is

appropriate. In granting a mixing zone, the SIP states that a mixing zone shall be as small as practicable, and meet the conditions provided in Section 1.4.2.2 as follows:

"A mixing zone shall be as small as practicable. The following conditions must be met in allowing a mixing zone:

A: A mixing zone shall not:

1. *compromise the integrity of the entire water body;*
2. *cause acutely toxic conditions to aquatic life passing through the mixing zone;*
3. *restrict the passage of aquatic life;*
4. *adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or State endangered species laws;*
5. *produce undesirable or nuisance aquatic life;*
6. *result in floating debris, oil, or scum;*
7. *produce objectionable color, odor, taste, or turbidity;*
8. *cause objectionable bottom deposits;*
9. *cause nuisance;*
10. *dominate the receiving water body or overlap a mixing zone from different outfalls; or*
11. *be allowed at or near any drinking water intake. A mixing zone is not a source of drinking water. To the extent of any conflict between this determination and the Sources of Drinking Water Policy (Resolution No. 88-63), this SIP supersedes the provisions of that policy."*

The outfall extends perpendicularly from the westerly bank of the Sacramento River for 250 feet and consists of an 18-inch diameter pipe. The last 100 feet of the outfall is the diffuser, which discharges 150 feet from shore at an average depth of 24 feet. The diffuser consists of fourteen three-inch ports evenly placed on 7.7 foot centers over the 100-foot length of the diffuser. Each port consists of a three-inch duckbill valve positioned 4 inches above the river bottom and angled at 30 degrees up from a horizontal position. The height and angle of each duckbill valve are designed to reduce potential effects of the effluent discharge on bottom dwelling aquatic life. Half of the duckbill valves point upstream and half point downstream in an alternating pattern.

The Sacramento River at the point of discharge is approximately 2,300 feet wide. A mixing zone study associated with the design of the diffuser was submitted prior to the adoption of Order No. R5-2004-0092. ECOLOGIC Engineering conducted a mixing zone study titled *Best Practicable Treatment and Control Development of a Mixing Zone*, dated 1 January 2004, using CORMIX computer modeling to assess whether the proposed diffuser would provide greater than 20:1 dilution. The modeling effort consisted of finding a steady state solution with effluent and river flow conditions being those that occur within one hour of a flow

reversal (i.e., two hours total = one hour before and one hour after flow reversal). In addition, a safety factor was applied. Several scenarios were analyzed to determine the most critical set of parameters for the mixing zone. Critical parameters that impact the analysis included river flow, river stage, effluent temperature, flow rate, and wind speed. Mixing was assessed at both low and high river velocities with a maximum temperature differential of 11°C, which corresponds with a 15°C effluent mixing into 4°C Sacramento River water. In addition to the critical conditions outlined, a sensitivity analysis was conducted to determine the impacts of lowering the temperature differential or increasing the wind speed.

The study demonstrated that within a mixing zone 150 feet (upstream and downstream) x 100 feet wide, the maximum effluent concentration was 2.5% (i.e., 40:1 dilution). This area was conservatively established as the acute and chronic mixing zone.

The Sacramento River in the vicinity of the discharge is tidally influenced, resulting in flow reversals. With flow reversals, some volume of river water is multiple dosed with the effluent as the river flows downstream past the discharger, reverses moving upstream past the discharge, a second time, then again reverses direction and passes the discharge point a third time as it moves down the river. A particular volume of river water may move back and forth, past the discharge point many times due to tidal action, each time receiving an additional load of wastewater. CORMIX was not developed to account for multiple dosing that may occur in tidal zones. Therefore, a very conservative approach was employed by ECOLOGIC Engineering to account for the multiple dosing affects. The study states the following:

> "CORMIX is intended primarily for the modeling of steady-state operational conditions and one-time flow reversals. However, in the case of the NWWTF discharge into the Sacramento River, it is estimated that under critical low river flow conditions a parcel of water could pass over the diffuser up to about 13 times (over the course of about three days). This is because of the large magnitude of the tidally-influenced flows compared to the net downstream river flows under critical low river flow conditions. Therefore, some accounting for these additional doses of effluent beyond the "one-time" flow reversal capabilities of the CORMIX model was necessary to allow for proper diffuser selection and modeling.
>
> Because of the timing, turbulence, and traverse of these multiple tidal flows, the earlier doses of effluent become dispersed over much of the river width while the last two doses at the flow reversal will have dispersed very little beyond the river cross-sectional area over the diffuser. It is assumed that the 11 earlier effluent doses preceding the final two effluent doses will have dispersed to a net/average effect of those earlier doses being uniformly dispersed in roughly the one-third of the river cross section that includes the diffuser. In other words, 11 doses of effluent (at effluent flows commensurate with low river flows) are diluted into one-third of the river flow, and this

> constitutes a "background percentage" of effluent already in the river water at the time of the most critical two effluent doses occurring at the final tidally induced flow reversal. This "background percentage" of effluent in the river flow from the first 11 doses of effluent is estimated to bet 1.3 percent. An effluent concentration of 1.3 percent was, therefore, added to the results obtained from the CORMIX model for assessment of diffuser effectiveness."

Based on the results of the study, a dilution credit of 20:1 was allowed in the previous Order for compliance with acute and chronic aquatic life criteria. This Order continues the allowance of the acute and chronic aquatic life mixing zone. The mixing zone extends 150 feet (upstream and downstream) and is 100 feet wide.

The mixing zone is as small as practicable, will not compromise the integrity of the entire water body, restrict the passage of aquatic life, dominate the water body or overlap existing mixing zones from different outfalls. The mixing zone is very small relative to the large size of the receiving water and is approximately 10 miles from the nearest drinking water intake and does not overlap a mixing zone from a different outfall.

The mixing zone will not cause acutely toxic conditions to aquatic life passing through the mixing zone, because the proposed Order requires compliance with an acute toxicity effluent limitation and requires acute bioassays using 100% effluent. Compliance with the acute toxicity effluent limitation assures the effluent is not acutely toxic.

The discharge will not adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under the Federal or State endangered species laws, because the mixing zone is very small and acutely toxic conditions will not occur in the mixing zone.

The discharge will not produce undesirable or nuisance aquatic life, result in floating debris, oil, or scum, produce objectionable odor, taste, or turbidity, cause objectionable bottom deposits, or cause nuisance, because the proposed Order requires end-of-pipe effluent limitations (e.g. for biochemical oxygen demand and total suspended solids) and discharge prohibitions to prevent these conditions from occurring.

As suggested by the SIP, in determining the extent of or whether to allow a mixing zone and dilution credit, the Regional Water Board has considered the presence of pollutants in the discharge that are carcinogenic, mutagenic, teratogenic, persistent, bioaccumulative, or attractive to aquatic organisms, and concluded that the allowance of the mixing zone and dilution credit is adequately protective of the beneficial uses of the receiving water.

The mixing zone therefore complies with the SIP. The mixing zone also complies with the Basin Plan, which requires that the mixing zone not adversely impact beneficial uses. Beneficial uses will not be adversely affected for the same

reasons discussed above. In determining the size of the mixing zone, the Regional Water Board has considered the procedures and guidelines in the EPA's Water Quality Standards Handbook, 2d Edition (updated July 2007), Section 5.1 and Section 2.2.2 of the Technical Support Document for Water Quality-Based Toxics Control (TSD). The SIP incorporates the same guidelines.

3. Determining the Need for WQBELs

a. 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.[5] The SIP states in the 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 , except for non-CTR constituents where the MCL is the applicable water quality objective and as otherwise described in section IV.C.3.d.xiii of this Fact Sheet. The RPA was based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs.

b. RPA Dataset. Data used for the RPA came from the Discharger's self-monitoring reports from August 2006 to January 2009 and the Discharger's most recent SIP sampling, which was conducted in January, June, September, and December 2002. The 18 December 2002 receiving water data was excluded from the RPA dataset, because it was collected during a significant storm event. Section 1.4.3.1 of the SIP states that "the RWQCB shall have discretion to consider if any samples are invalid for use as applicable data due to evidence that the sample has been erroneously reported or the samples is not representative of the ambient receiving water column that will mix with the discharge. For example, the RWQCB shall have discretion to consider samples to be invalid that have been taken during peak flows of significant storm events." The 18 December 2002 receiving water sampling event included elevated concentrations for several metals (see Table below), which is an indication of high sediment load in the river that occurs during storm events. Metals criteria are based on dissolved metals. The elevated total recoverable metals concentrations during the storm event (e.g., 5-7 times other samples) were likely due to a large sediment load in the river, which will increase the total metals concentration, not the dissolved metals concentration.

According to Department of Water Resources flow data, the Sacramento River was flowing at 48,465 cubic feet per second (cfs) on 18 December 2002 at the Freeport Bridge. Precipitation data from Sacramento County Department of Water Resources indicates that from 13 December 2002 to 15 December 2002, an accumulated rainfall amount of 8.19 inches was measured in Sacramento

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

County (at Morrison Creek on Mack Road). The 18 December 2002 sample was taken near the peak of the storm event, which saw the Sacramento River peak at 53,160 cfs on 20 December 2002. The Sacramento River flows were approximately 10,000 cfs prior to this storm event. This information indicates that the 18 December 2002 sample was collected during a significant storm event. Therefore, in accordance with the SIP, the Regional Water Board finds that the data is invalid and is not representative of the ambient receiving water column that will mix with the discharge.

The table shows the ambient total recoverable metal concentrations and the corresponding Sacramento River flow for the samples collected by the Discharger in 2002. As shown by the data, the 18 December 2002 samples are elevated due to the storm event. This is just a sampling of the metals data that showed sharp contrasts. The remaining metals data were fairly consistent throughout the four sampling events.

Metals	**Sample Date (Sacramento River Flow)**				
	30 Jan 2002 (19,724 cfs)	**5 Jun 2002 (12,740 cfs)**	**10 Sep 2002 (13,877 cfs)**	**18 Dec 2002 (48,465 cfs)**	**% Diff[2]**
	Total Recoverable Metals Concentration (µg/L)				
Copper	4.4	3.6	3.4	14	370%
Aluminum	700	700	800	5000	680%
Manganese[1]	33	25	23	9.9	40%
Zinc	5	4	4	24	550%
Nickel	5.5	3.9	4.6	22	470%
Lead	0.52	0.4	0.4	3.1	710%
Iron[1]	1600	1000	1100	9.4	0.80%

[1] The reported concentrations for manganese and iron are very unusual considering the high sediment load in the river. These constituents typically increase when there are high sediment loads. It is suspected that the incorrect units were used. However, lab sheets were not available to verify.

[2] Percent difference between the 18 December sample and the average of the previous 3 samples.

c. **Constituents with Limited Data.** Reasonable potential cannot be determined for the following constituents because effluent data are limited or not available, ambient background concentrations are not available, or the analytical method detection levels exceed the criterion. Where stated below, the Discharger is

required to continue to monitor for these constituents in the effluent using analytical methods that provide the best feasible detection limits. When additional data become available, further analysis will be conducted to determine whether to add, remove, or retain numeric effluent limitations or to continue monitoring.

i. **2,3,7,8-TCDD and TCDD-Equivalents.** 2,3,7,8-TCDD was not sampled in the Facility effluent. The maximum observed upstream receiving water TCDD-equivalents concentration was not detected (reporting level of 0.0000023 µg/L) based on three samples collected between January 2002 and September 2002. In the receiving water, the cogeners of chlorinated dibenzodioxins and chlorinated dibenzofurans were not tested.

   Due to the lack of effluent data, the Regional Water Board is unable to complete the reasonable potential analysis. This Order requires semi-annual monitoring during the third year of the permit term of all 2,3,7,8 TCDD congeners.

ii. **Inorganic Constituents (Asbestos, Chromium (VI), and Tributyltin).** Asbestos, chromium (IV), and tributyltin were not sampled in the Facility effluent. The ambient background monitoring data results for these constituents were not detected (reporting level of 0.2 µg/L for asbestos, 0.5 µg/L for chromium (IV), and 0.002 µg/L for tributyltin) based on three samples collected between January 2002 and September 2002.

   The receiving water data does not exceed the applicable water quality objectives. However, due to no effluent data, the Regional Water Board is unable to complete the reasonable potential analysis. This Order requires the Discharger to perform SIP monitoring of the effluent and receiving water quarterly during the third year of the permit to gather data for the next permit renewal.

iii. **Pesticides (Alachlor, Atrazine, Bentazon, Carbofuran, 2,4-Dalapon, Di(2-ethylhexyl)adipate, Dionseb, Diquat, Endothal, Ethylene Dibromide, Glyphosate, Molinate (Ordram), Oxamyl, Picloram, Simazine (Princep), 2,4,5-TP (Silvex).** These constituents were not sampled in the Facility effluent. The ambient background monitoring data results for these constituents were not detected (see Attachment G for reporting levels) based on three samples collected between January 2002 and September 2002.

   The receiving water data does not exceed the applicable water quality objectives. However, due to no effluent data, the Regional Water Board is unable to complete the reasonable potential analysis. This Order requires the Discharger to perform SIP monitoring of the effluent and receiving water quarterly during the third year of the permit to gather additional data for the next permit renewal.

d. Constituents with No Reasonable Potential. WQBELs are not included in this Order for constituents that do not demonstrate reasonable potential (see Attachment G Reasonable Potential Analysis); however, monitoring for those pollutants is established in this Order as required by the SIP. If the results of effluent monitoring demonstrate reasonable potential, this Order may be reopened and modified by adding an appropriate effluent limitation. Based on new data and the procedures established in Section 1.3 of the SIP for determining reasonable potential, the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion for the following constituents:

i. Bis (2-ethylhexyl) phthalate

(a) WQO. Bis (2-ethylhexyl) phthalate is a colorless oily liquid that is extensively used as a plasticizer in a wide variety of industrial, domestic, and medical products. It is in polyvinyl chloride plastic product like toys, plastic upholstery, shower curtains, adhesives, and coatings. Bis (2-ethylhexyl) phthalate is also used in inks, pesticides, cosmetics, and vacuum pump oil. Bis (2-ethylhexyl) phthalate is insoluble in water, miscible with mineral oil and hexane, and soluble in most organic solvents. The California Office of Environmental Health Hazard Assessment and USEPA have determined that bis (2-ethylhexyl) phthalate may reasonably be anticipated to be a carcinogen. The CTR human health criterion (for waters that are sources of drinking water and from which aquatic organisms may be consumed) is 1.8 µg/L.

(b) RPA Results. The effluent data provided by the Discharger indicates that bis (2-ethylhexyl) phthalate was not detected in any of the ten effluent samples collected between October 2006 and December 2008. Bis (2-ethylhexyl) phthalate has not been detected in the Sacramento River based on three samples collected between January 2002 and September 2002. Based on this data and the procedures established in Section 1.3 of the SIP for determining reasonable potential, the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the CTR water quality criterion for bis (2-ethyhexyl) phthalate.

ii. Chlorine Residual

(a) WQO. USEPA developed National Recommended Ambient Water Quality Criteria for protection of freshwater aquatic life for chlorine. The recommended water quality criteria for total residual chlorine are 11 µg/L (4-day average, CCC) and 19 µg/L (1-hour average, CMC).

(b) RPA Results. The Discharger does not use chlorine for disinfection. The new Facility utilizes ultraviolet (UV) disinfection of the final effluent. Since installation of the UV system, chlorine residual was not detected (above the analysis method detection limit of less than the reporting level of 0.01

mg/L) in the effluent discharge, based on 274 samples collected between October 2006 and December 2008.

Chlorine is not used for disinfection purposes, but is used for cleaning the membrane bioreactors (MBRs) weekly. Sodium hypochlorite is used to control biological growth on the four membrane units. Each of the four units is cleaned one day each week from Monday through Thursday using 2.5 liters of sodium hypochlorite during a cleaning cycle with the membrane unit full of mixed liquor. Only one unit enters a cleaning cycle at a time. The cleaning process is a closed process in which the membrane unit has chlorine injected into the membranes while treated effluent is pulsed back across the membrane strands and into the membrane basins. This process is repeated eight times and takes about an hour to complete. All chlorine is flushed from the membranes into the mixed liquor within the unit. The system does not permeate (i.e., discharge effluent from the unit) during the cleaning process, thus no chlorine can enter the effluent during the cleaning cycle. The chlorine dosing is low and the chlorine demand of the mixed liquor in the unit is very high due to the high organic load. Therefore, the likelihood of any chlorine residual in the effluent after the cleaning is unlikely.

The Discharger conducted a study to verify that chlorine is not discharged during the cleaning process. The Study demonstrated there was no chlorine residual in the final effluent during or immediately after the cleaning of the membranes. The study was performed 9 February 2007, and consisted of monitoring total residual chlorine of the MBR effluent and the final effluent. Sampling was conducted before and after the cleaning process and on 10 minute intervals during the cleaning process. Chlorine analyses were performed using Standard Methods procedure SM 4500-CLD forward titration. There are four trains in the membrane reactor. Train #1 was being cleaned and was used during the testing. Trains #2 and #3 were offline and Train #4 was in operation mode during the entire maintenance clean cycle. Train #4 was turned off operation mode after Train #1 maintenance cleaning was finished to simulate a worst-case scenario. This allowed the measurement of the Train #1 effluent without being diluted with Train #4 effluent. This is not in accordance with the standard operation procedures, but simulates a worst-case scenario. The results of the study showed that total chlorine residual was not detected (i.e., <0.01 mg/L) at the effluent of the MBRs and in the final effluent for all samples.

Effluent monitoring data and the study conducted by the discharger demonstrate that residual chlorine is not present in the effluent discharge. Therefore, the discharge does not have reasonable potential to cause or contribute to an exceedance of the narrative toxicity objective. However, this Order requires daily grab samples for chlorine when chlorine is used

for maintenance purposes at the Facility. If chlorine residual is detected in the effluent, this Order will be reopened for the addition of an effluent limit.

iii. Chloroform

(a) WQO. Chloroform is a colorless, nonflammable liquid. Chloroform is formed as a by-product when chlorine is added to wastewater to kill pathogens. The USEPA National Recommended Ambient Water Quality Criterion for human health protection (for waters that are sources of drinking water and form which aquatic organisms may be consumed) is 5.7 µg/L, based on a 1- in- 1,000,000 cancer risk. The Office of Environmental Health Hazard Assessment (OEHHA) has published and maintains the Toxicity Criteria Database, which contains cancer potency factors for chemicals, including chloroform, that have been used as a basis for regulatory actions by the boards, departments and offices within the California Environmental Protection Agency (Cal/EPA). The cancer potency factor for oral exposure to chloroform in this database is 0.031 milligrams per kilogram body weight per day (mg/kg-day). By applying standard toxicologic assumptions used by OEHHA, USEPA and other environmental agencies is evaluating health risks via drinking water exposure (i.e., 70 kg body weight and 2 liters per day water consumption), this cancer potency factor is equivalent to a concentration in drinking water of 1.1 µg/L (ppb) at the 1-in-a-million cancer risk level. The 1-in-a-million risk level is consistent with that used by the Department of Public Health (DPH) to set *de minimis* risks from involuntary exposure to carcinogens in drinking water in the development of drinking water MCLs and Action Levels and by OEHHA to set negligible cancer risks in the development of Public Health Goals for drinking water. The one-in-a million cancer risk level is also mandated by USEPA is applying human health protective criteria contained in the National Toxics Rule and the California Toxics Rule for priority pollutants in California surface waters.

(b) RPA Results. The maximum effluent concentration for chloroform was 0.70 µg/L, based on ten samples collected between October 2006 and December 2008. Out of the ten effluent samples, chloroform was estimated (J-flag) once at 0.2 µg/L and not detected (less than reporting level of 1 µg/L) in eight effluent samples. Chloroform was not detected (less than reporting level of 0.5 µg/L) in the Sacramento River, based on three samples collected between January 2002 and September 2002. Based on this data and the procedures established in Section 1.3 of the SIP for determining reasonable potential, the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the CTR water quality criterion for chloroform.

iv. Chlorodibromomethane (Dibromochloromethane)

(a) WQO. Chlorodibromomethane is a colorless, nonflammable liquid. Chlorodibromomethane is formed as a by-product when chlorine is added

to wastewater to kill pathogens. The California Department of Public Health (DPH) has determined that Chlorodibromomethane is reasonable anticipated to be a human carcinogen. The CTR human health criterion (for waters that are sources of drinking water and from which aquatic organisms may be consumed) is 0.40 µg/L, based on a 1- in 1,000,000 cancer risk.

(b) RPA Results. Chlorodibromomethane was not detected (less than reporting level of 1.0 µg/L) in the effluent discharge, based on ten samples collected between October 2006 and December 2008, and not detected (less than reporting level of 0.5 µg/L) in the Sacramento River, based on three samples collected between January 2002 and September 2002. Based on this data and the procedures established in Section 1.3 of the SIP for determining reasonable potential, the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the CTR water quality criterion for chlorodibromomethane.

v. Cyanide

(a) WQO. The CTR includes maximum 1-hour average and 4-day average cyanide concentrations of 22 µg/L and 5.2 µg/L, respectively, for the protection of freshwater aquatic life.

(b) RPA Results. Cyanide was not detected (less than reporting level of 3 µg/L) in the effluent discharge, based on ten samples collected between October 2006 and December 2008, and detected in the Sacramento River at 3.0 µg/L, based on three samples collected between January 2002 and September 2002. Cyanide was not detected (less than reporting level of 3 µg/L) in all of the Sacramento River samples. Based on this data and the procedures established in Section 1.3 of the SIP for determining reasonable potential, the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the CTR water quality criterion for cyanide.

vi. Dichlorobromomethane (Bromodichloromethane)

(a) WQO. 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.

(b) RPA Results. Dichlorobromomethane was not detected (less than reporting level of 1 µg/L) in the effluent discharge, based on ten samples collected between October 2006 and December 2008, and not detected (less than reporting level of 0.5 µg/L)in the upstream receiving water, based on three samples collected between January 2002 and September 2002. Based on this data and the procedures established in Section 1.3

of the SIP for determining reasonable potential, the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the CTR water quality criterion for dichlorobromomethane.

vii. Foaming Agents (MBAS)

(a) WQO. The CTR does not list MBAS as priority pollutants. The Basin Plan includes a water quality objective that *"…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) specified in the following provisions of Title 22 of the California Code of Regulations…Tables 64449-A (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits) and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of Section 64449."* The Basin Plan also includes water quality objectives that water not contain floating material or taste- or odor-producing substances in concentrations that causes nuisance or adversely affect beneficial uses. Municipal and domestic supply and non-contact water recreation, which includes aesthetic enjoyment, are beneficial uses of the Sacramento River.

(b) RPA Results. The maximum effluent concentration for MBAS was 59 µg/L, based on ten samples collected between October 2006 and December 2008. MBAS was not detected (less than reporting level of 0.05 µg/L) in six of the ten samples and estimated (J-flagged) once at 48 µg/L. MBAS was not detected (less than reporting level of 0.05 µg/L) in the upstream receiving water, based on three samples collected between January 2002 and September 2002. Based on this data and the procedures established in Section 1.3 of the SIP for determining reasonable potential, the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the CTR water quality criterion for MBAS.

viii. Lead, Total Recoverable

(a) WQO. The CTR includes hardness dependent criteria for the protection of freshwater aquatic life for lead. Using the default conversion factors and reasonable worse-case measured hardness, as described in section IV.C.2.c.i of this Fact sheet, the applicable acute (1-hour average) criterion is 36 µg/L and the applicable chronic (4-day average) criterion is 1.4 µg/L, as total recoverable.

(b) RPA Results. The maximum effluent concentration (MEC) for lead was 0.25 µg/L (as total recoverable), based on one sample collected 17 March 2009, while the maximum observed upstream receiving water concentration was 0.52 µg/L (as total recoverable), based on three samples collected between January 2002 and September 2002.

Therefore, the discharge does not have a reasonable potential to cause or contribute to an in-stream excursion above the CTR criterion for the protection of freshwater aquatic life.

ix. Manganese, Total Recoverable

(a) WQO. The Basin Plan (Table III-1) contains a water quality objective of 50 µg/L for dissolved manganese which is a site-specific numeric objective applicable to the Sacramento-San Joaquin Delta. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. Since there is no dissolved-to-total metal translator available for manganese, it was assumed that the translator is equal to 1.

(b) RPA Results. The maximum effluent concentration (MEC) for manganese was 11 µg/L, based on nine samples collected between October 2006 and December 2008. Manganese was not detected (less than reporting level of 5 µg/L) in six of the nine samples and estimated (J-flagged) at 0.8 µg/L and 3.3 µg/L. The maximum observed upstream receiving water concentration was 33 µg/L, based on three samples collected between January 2002 and September 2002. Therefore, the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the CTR water quality criterion for manganese.

x. Nitrite (see Section IV.c.3.d.ix, below for Nitrate plus Nitrite)

xi. Organochlorine Pesticides

(a) WQO. The Sacramento San-Joaquin Delta has been listed as an impaired water body pursuant to Section 303(d) of the Clean Water Act because of (1) diazinon and chlorpyrifos (organophosphate pesticides), (2) Group A-organochlorine pesticides {aldrin, chlordane, dieldrin, endolsulfan (alpha, beta, sulfate), endrin, endrin aldehyde, 4,4'-DDT, heptachlor, heptachlor epoxide, hexachlorocyclohexane (alpha, beta, delta, and lindane), and toxaphene}, and (3) unknown toxicity. The Basin Plan objectives regarding pesticides include:

(i) no individual pesticides shall be present in concentrations that adversely affect beneficial uses,

(ii) discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affects beneficial uses,

(iii) total chlorinated hydrocarbon pesticide concentrations shall not be present in the water column at detectable concentrations, and

(iv) pesticide concentrations shall not exceed those allowable by applicable antidegradation policies.

(b) RPA Results. Organochlorine pesticides were not detected in the effluent discharge, based on samples collected in July 2008, while organochlorine pesticides were not detected in the Sacramento River, based on three samples collected between January 2002 and September 2002. Detection levels are less than or equal to the SIP minimum levels. Therefore, the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the CTR water quality criterion for organochlorine pesticides.

xii. Oil & Grease

(a) WQO. Untreated domestic wastewater contains oil and grease. The Basin Plan includes a water quality objective for oil and grease 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".*

(b) RPA Results. The previous Order included numeric monthly average and daily maximum effluent limitations of 10 mg/L and 15 mg/L, respectively. Oil and grease was not detected (less than reporting level of 5 mg/L) in the eleven samples collected between October 2006 and October 2008. Based on this data and the procedures established in Section 1.3 of the SIP for determining reasonable potential, the discharge no longer demonstrates reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative objective for oil and grease and floating material. However effluent monitoring for oil and grease is required and a receiving water limitation is included that prohibits the discharge to cause "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."

xiii. Salinity

(a) WQO. The Basin Plan contains a chemical constituent objective that incorporates state MCLs, contains a narrative objective, and contains numeric water quality objectives for electrical conductivity, total dissolved solids, sulfate, and chloride. The State Water Board's Bay-Delta Plan establishes salinity water quality objectives as electrical conductivity at various compliance points in the Sacramento-San Joaquin Delta to protect beneficial uses. The USEPA National Ambient Water Quality Criteria for chloride recommends acute and chronic criteria for the protection of aquatic life. There are no USEPA water quality criteria for the protection of aquatic life for electrical conductivity, total dissolved solids, and sulfate.

Table F-5. Salinity Water Quality Criteria/Objectives

Parameter	Agricultural WQ Goal[1]	Secondary MCL[2]	Basin Plan/Bay-Delta Plan[4]	Effluent (October 2006 – December 2008)			Receiving Water Range (January 2002 – December 2002)	Source Water[6]
				No. of Samples	Range	Max Annual Average		
EC, umhos/cm	Varies[3]	900, 1600, 2200	450 - 2,780[5]	28	1,117-1,600	1,426	180 - 280	--
TDS, mg/L	Varies	500, 1000, 1500	N/A	10	770-1,100	864	100 - 190	--
Chloride, mg/L	Varies	250, 500, 600	N/A	10	170-260	206	7 - 20	--
Sulfate, mg/L	Varies	250, 500, 600	N/A	--		--	7.9 - 15	--

1 Agricultural water quality goals 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)
2. The secondary MCLs are stated as a recommended level, upper level, and a short-term maximum level.
3. The EC level in irrigation water that harms crop production depends on the crop type, soil type, irrigation methods, rainfall, and other factors. An EC level of 700 µmhos/cm is generally considered to present no risk of salinity impacts to crops. However, many crops are grown successfully with higher salinities.
4 The water quality objective applies to the Sacramento River at Emmaton in the Western Delta.
5 The water quality objective can vary based on the Sacramento Valley Water Year Hydrologic Classification (see Table 2).
6 The Discharger was not required to monitor water supply in the existing permit.

Table F-6. Basin Plan Water Quality Objectives for EC Sacramento River at Emmaton, Based on Water Year Type (maximum 14-day running average of mean daily EC in µmhos/cm)

Date	Water Year Type				
	Wet	Above Normal	Below Normal	Dry	Critical
1 April – 14 June	450	450	450	450	2780
15 June – 19 June	450	450	450	1670	2780
20 June – 30 June	450	450	1140	1670	2780
1 July - 15 August	450	630	1140	1670	2780

Table F-7. Historical Sacramento River Compliance with EC Objectives at Emmaton

Water Year Type	Water Years 1999 - 2008			
	# of Years This Type	Number of Years with Exceedances	Year w/ Exceedances (# of Days)	Applicable Objectives (µmhos/cm)
Wet	2	0	N/A	450
Above Normal	3	0	N/A	450/650
Below Normal	1	1	2004 (13)[1]	450/1140
Dry	3	0	N/A	450/1670
Critically Dry	1	0	N/A	2780

1 Jones Track levee break 3 June – 30 June; exceedances 6/7 – 6/19.

(1) Chloride. The secondary MCL for chloride is 250 mg/L, as a recommended level, 500 mg/L as an upper level, and 600 mg/L as a short-term maximum. The recommended agricultural water quality goal for chloride that is used as a screening level 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. The USEPA National Ambient Water Quality Criteria for chloride recommends acute (1-hour) and chronic (4-day) criteria for the protection of freshwater aquatic life of 860 mg/L and 230 mg/L, respectively.

(2) Electrical Conductivity. The secondary MCL for EC is 900 µmhos/cm as a recommended level, 1600 µmhos/cm as an upper level, and 2200 µmhos/cm as a short-term maximum. The State Water Board's Bay-Delta Plan establishes water quality objectives that apply to waters of the San Francisco Bay system and the legal Sacramento-San Joaquin Delta. The Bay-Delta Plan's water quality objective for EC for agricultural beneficial uses (for the Sacramento River at Emmaton in the Western Delta) varies accordingly to the water year hydrologic classifications ranging from 450 µmhos/cm to 2,780 µmhos/cm (see Table F-6, above). These objectives apply to the Facility's discharge.

(3) Sulfate. The secondary MCL for sulfate is 250 mg/L as a recommended level, 500 mg/L as an upper level, and 600 mg/L as a short-term maximum.

(4) Total Dissolved Solids. The secondary MCL for TDS is 500 mg/L as a recommended level, 1000 mg/L as an upper level, and 1500 mg/L as a short-term maximum. The recommended agricultural water quality goal for TDS that is used as a screening level is 450 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). Water Quality for Agriculture evaluates the impacts of salinity levels on crop tolerance and yield reduction, and establishes water quality goals that are protective of the agricultural uses. The 450 mg/L water quality goal is intended to prevent reduction in crop yield, i.e. a restriction on use of water, for salt-sensitive crops. Only the most salt sensitive crops require irrigation water of 450 mg/L or less to prevent loss of yield. Most other crops can tolerate higher TDS concentrations without harm, however, as the salinity of the irrigation water increases, more crops are potentially harmed by the TDS, or extra measures must be taken by the farmer to minimize or eliminate any harmful impacts.

(b) RPA Results.

For priority pollutants, the SIP dictates the procedures for conducting the RPA. EC, TDS, chloride, and sulfate are not priority pollutants. Therefore, the Regional Water Board is not restricted to one particular RPA method. Due to the site-specific conditions of the discharge, the Regional Water Board has used best professional judgment in determining the appropriate method for conducting the RPA for these non-priority pollutant salinity constituents. For conducting the RPA, the USEPA recommends using a mass-balance approach to determine the expected critical downstream receiving water concentration using a steady-state approach[6]. This downstream receiving water concentration is then compared to the applicable water quality objectives to determine if the discharge has reasonable potential to cause or contribute to an in-stream excursion. This approach allows assimilative capacity and dilution to be factored into the RPA. This USEPA recommended approach has been used for these salinity constituents. The critical downstream receiving water concentration is calculated using equation 2 below:

$$C_r = \frac{Q_s C_s + Q_d C_d}{Q_r} \qquad \text{(Equation 2)}$$

Where,

Q_s = Critical stream flow (1Q10) for acute criteria, (7Q10) for chronic criteria, and harmonic mean flow for human health criteria.

Q_d = Critical effluent flow from discharge flow data (maximum permitted discharge)

Q_r = Sum of critical stream flow and critical effluent flow

C_s = Critical upstream pollutant concentration

C_d = Critical effluent pollutant concentration

C_r = Critical downstream receiving water pollutant concentration

The critical stream flows are 5,100 cubic feet per second (cfs) for the 1Q10 flow, 5,800 cfs for the 7Q10 flow, and 15,700 cfs for the harmonic mean flow. These critical stream flows were calculated based on USGS flow data for the Sacramento River at the Freeport Bridge for the period of 1970 – 2009. For completely-mixed discharges the USEPA recommends using the 1Q10 and 7Q10 critical stream flows for acute and chronic aquatic life criteria, respectively. For long term human health criteria, the USEPA recommends using the harmonic mean flow.

[6] USEPA NPDES Permit Writers' Course (EPA 833-B-97-001 rev. October 2009)

For incompletely-mixed discharges, when a mixing zone(s) has been allowed, the USEPA recommends calculating the critical downstream receiving water constituent concentration at the edge of the approved mixing zone(s). In this case, the discharge is incompletely-mixed. Section IV.C.2.d, above, discusses mixing zones and dilution. This Order allows a dilution credit for acute and chronic aquatic life criteria of 20:1. The mixing zone extends 150 feet (upstream and downstream) and is 100 feet wide. Therefore, for the RPA the critical downstream receiving water constituent concentration, C_s, has been calculated at the edge of the approved aquatic life mixing zone. Most of the water quality objectives for salinity constituents are long term agricultural or human health criteria. Therefore, using this approach results in a conservative estimate of the critical downstream receiving water constituent concentrations.

The critical effluent flow, Q_d, is 1.0 million gallons per day (mgd) (i.e., 1.55 cfs), which is the maximum permitted flow allowed in this Order. Since a dilution credit of 20:1 is used in this evaluation, the critical stream flow, Q_s, was set to 20 mgd (i.e., 31 cfs) for this evaluation to maintain a 20:1 dilution ratio (river flow: effluent flow). This is significantly less than the 1Q10, 7Q10, and harmonic mean river flows.

The critical effluent pollutant concentration, C_d, was determined using statistics recommended in the TSD for statistically calculating the projected maximum effluent concentration (MEC) (i.e., Table 3-1 of the TSD using the 99% probability basis and 99% confidence level).

(1) Chloride. Chloride concentrations in the effluent ranged from 5.8 mg/L to 260 mg/L, with an average of 180 mg/L based on ten samples from October 2006 to October 2008. The projected MEC is 528 mg/L, using Table 3-1 of the TSD. The MEC and projected MEC exceed the agricultural water goal of 106 mg/L and USEPA's NAWQC for chloride, which includes a chronic criterion of 230 mg/L. Background concentrations in the Sacramento River ranged from 7 mg/L to 20 mg/L, based on three samples collected by the Discharger from January 2002 through September 2002.

Using Equation 2, above, the critical downstream chloride concentration is calculated as follows:

Q_s = 20 mgd
Q_d = 1 mgd
C_d = 528 mg/L
C_s = 20 mg/L

$$C_r = \frac{(20 \text{ mgd} \times 20 \text{ mg/L} + 1 \text{ mgd} \times 528 \text{ mg/L})}{(20 \text{ mgd} + 1 \text{ mgd})}$$

$$= 44 \text{ mg/L}$$

The critical downstream receiving water chloride concentration (i.e., 44 mg/L) does not exceed the NAWQC chronic criterion of 230 mg/L or the agricultural goal of 106 mg/L. Consequently, the discharge does not demonstrate reasonable potential for chloride and WQBELs are not needed.

(2) Electrical Conductivity. A review of the Discharger's monitoring reports shows an average effluent EC of 1,338 µmhos/cm, with a range from 1,117 µmhos/cm to 1,600 µmhos/cm based on 28 samples from August 2006 to December 2008. These levels exceed the agricultural water goal. The projected MEC using Table 3-1 of the TSD is 1,813 µmhos/cm.

The Department of Water Resources and the United States Bureau of Reclamation control flows through the Delta to ensure compliance with the EC water quality objectives at Emmaton. Based on daily EC data for the Sacramento River from August 1999 through April 2007, the Basin Plan water quality objectives were only exceeded during the Jones Tract levee break in June 2004, which was an unusual event and does not represent "normal" conditions. At all other times, the EC of the river was always in compliance with the objectives. Table F-7, above, displays a summary of Sacramento River compliance with the Basin Plan water quality objectives at Emmaton.

The Basin Plan includes different water quality objectives for EC depending on the time of year and water year hydrologic classification, ranging from 450-2780 µmhos/cm (see Table F-6). The RPA was conducted for each water quality objective and shown in Table F-8, below. As an example, the critical downstream EC concentration under conditions when the Basin Plan EC objective is 450 µmhos/cm is calculated as follows, using Equation 2, above:

Q_s = 20 mgd
Q_d = 1 mgd
C_d = 1813 µmhos/cm
C_s = 233 µmhos/cm

$$C_r = \frac{(20 \text{ mgd} \times 233 \text{ µmhos/cm} + 1 \text{ mgd} \times 1813 \text{ µmhos/cm})}{(20 \text{ mgd} + 1 \text{ mgd})}$$

$$= 308 \text{ µmhos/cm}$$

The critical downstream receiving water EC concentration (i.e., 308 µmhos/cm) does not exceed the Basin Plan water quality objective of 450 µmhos/cm, therefore, there is no reasonable potential and WQBELs are not necessary. Table F-8, below, summarizes the critical downstream receiving water EC concentrations under the

various conditions for when each of the Basin Plan EC objectives apply. For each evaluation, the inputs for Q_s, Q_d, and C_d are the same (Q_s = 20 mgd, Q_d = 1 mgd, and C_d = 1813 µmhos/cm). The critical upstream receiving water concentration, C_s, varies based on the conditions under which the various water quality objectives apply.

Table F-8. EC Reasonable Potential Analysis

Basin Plan Objective[1]	[C_s] Critical Upstream Receiving Water EC (µmhos/cm)[2]	[C_r] Critical Downstream Receiving Water EC (µmhos/cm)	Reasonable Potential
450	233	308	No
630	361	430	No
1140	926	968	No
1670	1187	1217	No
2780	1948	1942	No

[1] See Table F-6 for description when objectives apply.
[2] Maximum 14-day average EC, based on daily Department of Water Resources Sacramento River EC data at Emmaton (1999 – 2008). Excludes data during the Jones Track levee break from 3 Jun 2004 – 30 June 2004.

As shown in Table F-8, the discharge does not demonstrate reasonable potential for EC under all conditions, therefore, WQBELs are not needed.

Although the discharge does not demonstrate reasonable potential, due to concerns with salinity in the Sacramento-San Joaquin Delta, this Order requires a performance-based effluent limit for EC to ensure the salinity of the discharge does not increase. This Order establishes an annual average effluent limitation of 1,500 µmhos/cm for EC, which is the maximum running annual average EC based on monthly EC data from September 2006 through December 2008.

(3) Sulfate. Background concentrations in the Sacramento River ranged from 7.9 mg/L to 15 mg/L, with an average of 11 mg/L, based on three samples from January 2002 to September 2002. Effluent sulfate data was not available. However, due to the low reported sulfate concentrations in the receiving water there is significant assimilative capacity available. Therefore, based on the RPA evaluations for EC and TDS using the USEPA RPA procedures discussed above, the Regional Water Board finds that there is no reasonable potential for sulfate. Based on the available dilution and assimilative capacity the effluent sulfate concentration would have to be greater than 5,000 mg/L for there to be reasonable potential. The City of Rio Vista's

Beach Wastewater Treatment Plant has similar salinity characteristics as the Northwest Wastewater Treatment Facility effluent, so it is reasonable to assume that the sulfate concentrations would be similar. The MEC for sulfate at the Beach WWTP is 120 mg/L, which supports the finding of no reasonable potential for sulfate.

(4) Total Dissolved Solids (TDS). The average TDS effluent concentration was 849 mg/L with concentrations ranging from 770 mg/L to 1,100 mg/L, based on ten samples from October 2006 to October 2008. The projected MEC is 1,431 mg/L, using Table 3-1 of the TSD. These levels exceed the applicable water quality objectives. The background receiving water TDS ranged from 100 mg/L to 190 mg/L, with an average of 140 mg/L, based on three samples from January 2002 to September 2002.

Using Equation 2, above, the critical downstream TDS concentration is calculated as follows:

Q_s = 20 mgd
Q_d = 1 mgd
C_d = 1,431 mg/L
C_s = 190 mg/L

$$C_r = \frac{(20 \text{ mgd} \times 190 \text{ mg/L} + 1 \text{ mgd} \times 1431 \text{ mg/L})}{(20 \text{ mgd} + 1\text{mgd})}$$

$$= 249 \text{ mg/L}$$

The critical downstream receiving water TDS concentration (i.e., 249 mg/L) does not exceed the agricultural water quality goal of 450 mg/L. Consequently, the discharge does not demonstrate reasonable potential for TDS and WQBELs are not needed.

xiv. Settleable Solids

(a) WQO. For inland surface waters, the Basin Plan states that "[w]ater shall not contain substances in concentration that result in the deposition of material that causes nuisance or adversely affects beneficial uses".

(b) RPA Results. Analytical monitoring results obtained since issuance of the previous permit showed that settleable solids concentration values were less than 0.1 ml/L, based on 116 samples collected from October 2006 to December 2008. The previous Order required monthly average and daily maximum effluent limitations for settleable solids of 0.1 ml/L and 0.2 ml/L, respectively. The effluent has not been observed to exceed the narrative objective for settleable solids in the Basin Plan. Therefore, effluent limitations for settleable solids are no longer necessary and are not included in this Order. However, the Facility is required to continue sampling in order to monitor settleable solids in the effluent. This Order

also includes a receiving water limitation for Settleable Substances to prevent deposition of material that causes nuisance or adversely affects beneficial uses.

xv. 1,2-Diphenylhydrazine

(a) WQO. 1,2-Diphenylhydrazine occurs as a white crystalline solids that dissolves only slightly in water. 1,2-Diphenylhydrazine is used as a starting material in the production of benzidine, which was previously used to manufacture benzidine-based dyes, and is also used in the production of anti-inflammatory drugs. 1,2-Diphenylhydrazine is no longer produced in the United States. The CTR human health criterion (for waters that are sources of drinking water and from which aquatic organisms may be consumed) is 0.04 µg/L.

(b) RPA Results. Data provided by the Discharger indicated that 1,2-diphenylhydrazine was not detected at a method detection level (MDL) of 0.6 µg/L in the Facility effluent based on eleven effluent samples collected between October 2006 and January 2009. 1,2-Diphenylhydrazine has not been detected (MDL = 0.13 µg/L) in the Sacramento River based on three samples collected between January 2002 and September 2002. Based on this data and the procedures established in Section 1.3 of the SIP for determining reasonable potential, the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the CTR water quality criterion for 1.2-dephenylhydrazine.

e. Constituents with Reasonable Potential. 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, copper, iron, mercury, nitrate plus nitrite, pathogens, pH, and temperature. WQBELs for these constituents are included in this Order. A summary of the RPA is provided in Attachment G, and a detailed discussion of the RPA for each constituent is provided below.

i. Aluminum

(a) WQO. USEPA developed National Recommended Ambient Water Quality Criteria (NAWQC) for protection of freshwater aquatic life for aluminum. The recommended 4-day average (chronic) and 1-hour average (acute) criteria for aluminum are 87 µg/L and 750 µg/L, respectively. However, information contained in Footnote L to the NAWQC summary table indicates that the development of the chronic criterion was based on specific receiving water conditions where there is low pH (6.5 to 6.8 pH units) and low hardness levels (<10 mg/L as $CaCO_3$). Monitoring data demonstrates that these conditions are not similar to those in the Sacramento River, which has been measure to have a minimum pH of 7.6 and minimum hardness of 58 µg/L as $CaCO_3$. <u>For similar reasons, the Utah Department of Environmental Quality (Department) only applies the</u>

87 µg/L chronic criterion for aluminum where the pH is less than 7.0 and the hardness is less than 50 mg/L as $CaCO_3$ in the receiving water after mixing. For conditions where the pH equals or exceeds 7.0 and the hardness is equal to or exceeds 50 mg/L as $CaCO_3$, the Department regulates aluminum based on the 750 µg/L acute criterion. Furthermore, other major dischargers have conducted aluminum water effects ratio (WER) studies for receiving waters within the Delta with similar characteristics as the Sacramento River that have shown that the 87 µg/L chronic criterion is overly protective under similar receiving water conditions. Therefore, it is unlikely that application of the stringent chronic criterion of 87 µg/L is necessary to protect aquatic life. Therefore, based on best professional judgment, only the acute criterion of 750 µg/L has been applied to this discharge.

The Basin Plan also includes a chemical constituent objective that states: *At a 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) specified in the provisions of Title 22, Table 64449-A of the California Code of Regulations.*

Criteria for aluminum include the following:

Source	Criteria (µg/L)
California Primary MCL	1,000
California Secondary MCL	200

The Sacramento River has the designated beneficial use of MUN.

(b) RPA Results. The maximum effluent concentration (MEC) for aluminum was 100 µg/L, based on ten samples collected between October 2006 and December 2008, while the maximum observed upstream receiving water concentration was 800 µg/L, based on three samples collected between January 2002 and October 2002. Therefore, aluminum in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the NAWQC criteria for the protection of freshwater aquatic life (acute criterion) and Secondary MCL.

(c) WQBELs. Since the receiving water exceeds the acute and chronic toxicity criteria, no assimilative capacity is available and a dilution credit cannot be allowed for development of the WQBELs for aluminum. This Order contains a final average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) for aluminum of 443 µg/L and 750 µg/L, respectively, based on the USEPA's National Recommended Ambient Water Quality Criteria for the protection of freshwater aquatic life

(acute criterion). The Order also contains an annual average effluent limitation of 200 µg/L for aluminum, based on the California Secondary MCL for protection of the MUN beneficial use.

(d) Plant Performance and Attainability. Analysis of the effluent data shows that the MEC of 100 µg/L is less than the applicable WQBELs. The Regional Water Board concludes, therefore, that immediate compliance with these effluent limitations is feasible.

ii. Ammonia

(a) WQO. The NAWQC for the protection of freshwater aquatic life for total ammonia, recommends acute (1-hour average; criteria maximum concentration or CMC) standards based on pH and chronic (30-day average; criteria continuous concentration or CCC) standards based on pH and temperature. USEPA also recommends that no 4-day average concentration should exceed 2.5 times the 30-day CCC. 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. Because the Sacramento River within the Sacramento-San Joaquin Delta has a beneficial use of cold freshwater habitat and the presence of salmonids and early fish life stages in the Sacramento River is well-documented, the recommended criteria for waters where salmonids and early life stages are present were used.

The maximum permitted effluent pH is 8.5 and the Basin Plan objective for pH in the receiving stream is in the range of 6.5 to 8.5. In order to protect against the worst-case short-term exposure of an organism, a pH value of 8.5 was used to derive the acute criterion. The resulting acute criterion is 2.14 mg/L

The 30-day average CCC is calculated using the temperature and pH of the effluent. Using effluent data from 1 August 2006 through 31 December 2008, the CCC was calculated for each day when temperature and pH were measured. The lowest 99.9% 30-day average CCC was 1.93 mg/L (as N). The corresponding pH used was 7.82.

Ammonia is a non-CTR constituent and WQBELs are calculated in accordance with SIP procedures for non-CTR constituents. The SIP procedure assumes a 4-day averaging period for calculating the long-term average discharge condition (LTA). USEPA recommends modifying the procedure for calculating permit limits for ammonia using a 30-day averaging period for the calculation of the LTA corresponding to the 30-day chronic criteria. While the LTAs corresponding to the acute and 4-day chronic criteria were calculated according to SIP procedures, the LTA

corresponding to the 30-day chronic criteria were calculated assuming a 30-day averaging period. The lowest LTA representing the acute 4-day averaging and 30-day chronic criteria is then selected for deriving the AMEL and MDEL. The remainder of the WQBEL calculation for ammonia was performed according to the SIP procedures.

The 4-day average concentration is derived in accordance with the USEPA criterion as 2.5 times the 30-day CCC. Based on the 30-day CCC of 1.93 mg/L (as N), the 4-day concentration that should not be exceeded is 4.83 mg/L (as N).

(b) RPA Results. 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 fully denitrifies to remove ammonia from the waste stream. Inadequate or incomplete nitrification may result in the discharge of ammonia to the receiving stream. Discharges of ammonia would violate the Basin Plan narrative toxicity objective. The maximum effluent concentration (MEC) for ammonia was 0.36 mg/L, based on ten samples collected from October 2006 to October 2008. The maximum observed upstream receiving water concentration was 0.3 mg/L, based on three samples collected from January 2002 to September 2002. The discharge is from a municipal wastewater treatment plant and ammonia is present in the discharge. Therefore, ammonia in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the NAWQC.

(c) WQBELs. The steps to derive the WQBELs are described above in Section IV.C.3.e.ii.(a) of this Fact Sheet. As discussed in Section IV.C.2.d, above, the Discharger completed a dilution/mixing zone study and a dilution credit is allowed for acute and chronic aquatic life criteria. Using a 20:1 dilution credit, an average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) for ammonia of 19 mg/L and 39 mg/L (as N), respectively, is calculated. However, due to concerns about ammonia in the Delta and because the Facility is capable of providing full nitrification/denitrification resulting in little or no ammonia in the discharge, a dilution credit is not allowed for ammonia. Therefore, this Order contains a final average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) for ammonia of 1.1 mg/L and 2.0 mg/L (as N), respectively.

(d) Plant Performance and Attainability. Analysis of the effluent data shows that the MEC of 0.36 mg/L and the monthly average effluent concentration of 0.12 mg/L are less than the applicable WQBELs. The Regional Water Board concludes, therefore, that immediate compliance with these effluent limitations is feasible.

iii. Copper

(a) WQO. The CTR includes hardness dependent criteria for the protection of freshwater aquatic life for copper. Using the default conversion factors and minimum observed upstream receiving water hardness of 50 mg/L (as $CaCO_3$), as described in section IV.C.2.c of this Fact Sheet, the applicable acute (1-hour average) criterion is 7.3 µg/L and the applicable chronic (4-day average) criterion is 5.2 µg/L., as total recoverable. In addition, the Basin Plan includes a site-specific objective for copper of 10 µg/L (dissolved) as a maximum concentration.

(b) RPA Results. The maximum effluent concentration (MEC) for copper was 18.0 µg/L (as total recoverable), based on ten samples collected between October 2006 and December 2008, while the maximum observed upstream receiving water concentration was 4.4 µg/L (as total recoverable), based on three samples collected between January 2002 and September 2002. Therefore, copper in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criterion for the protection of freshwater aquatic life.

(c) WQBELs. Since the receiving water does not exceed the acute and chronic criteria, assimilative capacity is available and a dilution credit of 20 is allowed for development of the WQBELs for copper. Using a receiving water hardness of 50 mg/L as $CaCO_3$ (see section IV.C.2.c of this Fact Sheet for discussion), the average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) for copper are 19 µg/L and 25 µg/L.

(d) Plant Performance and Attainability. Analysis of the effluent data shows that the MEC of 18 µg/L is less than the applicable WQBELs. The Regional Water Board concludes, therefore, that immediate compliance with the effluent limitations is feasible.

iv. Iron

(a) WQO. The Secondary MCL – Consumer Acceptance Limit for iron is 300 µg/L (dissolved), which is used to implement the Basin Plan's chemical constituent objective for the protection of municipal and domestic supply. The Basin Plan also contains a site-specific numeric objective for the Sacramento San-Joaquin Delta of 300 µg/L (dissolved).

(b) RPA Results. The maximum effluent concentration (MEC) for total recoverable iron was 200 µg/L, based on 8 samples collected between 19 October 2006 and 8 October 2008, while the maximum observed upstream receiving water concentration was 1,600 µg/L, based on three samples collected between January 2002 and September 2002.

Therefore, total recoverable iron in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the secondary MCL and numeric site-specific Basin Plan objective.

As discussed above, the water quality objective for iron is expressed in dissolved metals. However, the RPA was conducted using total recoverable iron data for the receiving water, because no current dissolved iron data is available for the Sacramento River within the vicinity of the discharge. Dissolved iron data from 1975-1977 from the Bay Delta and Tributaries Project database is available for this part of the Sacramento River ranging from 20 µg/L to 70 µg/L. Furthermore, dissolved iron data for the Sacramento River at Freeport (approximately 30 miles upstream of the discharge) does not exceed the dissolved Basin Plan objective. This data indicates that it is possible there would be no reasonable potential based on dissolved iron data if it were available in the vicinity of the discharge. If the Discharger collects and submits dissolved iron data for the Sacramento River within the vicinity of the discharge this permit may be reopened to reevaluate the RPA.

(c) WQBELs. The numeric site-specific objective is applied as a maximum daily limitation, whereas the secondary MCL is applied as an annual average limitation. For permit effluent limitation derivation, the more stringent site-specific numeric objective applies to the discharge. The limitation must be expressed as total recoverable metal. There have been no approved studies to evaluate discharge-specific metal translators for iron; therefore, the dissolved Basin Plan objective translates to a total recoverable concentration of 300 µg/L (using a factor of 1.0). Due to no assimilative capacity, dilution credits are not allowed for development of the WQBELs for iron. This Order contains maximum daily effluent limitation for iron of 300 µg/L based on the Basin Plan's site-specific objective for iron.

(d) Plant Performance and Attainability. Analysis of the effluent data shows that the MEC of 200 µg/L is less than the applicable WQBELs. The Regional Water Board concludes, therefore, that immediate compliance with these effluent limitations is feasible.

v. Mercury

(a) WQO. The current NAWQC 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 (based on a threshold dose level causing neurological effects in infants) of 0.050 µg/L for waters from which both water and aquatic organisms are consumed. Both values are controversial and subject to change. In 40 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.

(b) RPA Results. The maximum observed effluent mercury concentration was 0.0015 µg/L. The Delta waterways are listed in accordance with CWA section 303(d) as impaired for mercury, based on bioaccumulation of this pollutant in fish tissue. Furthermore, health advisories by the Cal/EPA Office of Environmental Health Hazard Assessment remain in effect for human consumption of fish in the Delta, including the Sacramento River at Rio Vista, due to excessive concentrations of mercury in fish tissue. Regional Water Board staff is developing a draft Methylmercury TMDL for the Delta that proposes methylmercury load reductions for facilities discharging to the Delta, including the lower Sacramento River. The Delta Methylmercury TMDL is scheduled for adoption by the Regional Water Board in 2010. Mercury bioaccumulates in fish tissue and, therefore, the discharge of mercury to the receiving water may contribute to exceedances of the narrative toxicity objective and impact beneficial uses.

(c) WQBELs. This Order contains a performance-based mass effluent limitation of 0.022 lbs/month for mercury for the effluent discharged to the receiving water. This limitation is based on maintaining the mercury loading at the current level until a total maximum daily load (TMDL) can be established and USEPA develops mercury standards that are protective of human health. The mass limitation was carried forward from the previous permit, Order No. R5-2004-0092.

If USEPA develops new water quality standards for mercury, this permit may be reopened and the effluent limitations adjusted.

(d) Plant Performance and Attainability. Analysis of the effluent data shows that the MEC of 0.0015 µg/L, which equates to 0.00038 lbs/month (Calculated as: [Maximum Effluent Concentration (mg/L) * [Average Dry Weather Flow Rate] * [8.34 (conversion factor)] * [365 days/12 months] = lbs/month) is less than the applicable limitation. The Regional Water Board concludes, therefore, that immediate compliance with these effluent limitations is feasible.

vi. Nitrate plus Nitrite

(a) WQO. DPH has adopted Primary MCLs 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. DPH has also adopted 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 MCL) and NAWQC 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.

(b) RPA Results. The Discharger obtained seven nitrite effluent samples from October 2006 through December 2008. All effluent nitrite samples were non-detect (<0.03 mg/L) with one sample estimated (J-flag) at 0.0092 mg/L. In the receiving water, the maximum nitrite concentration was non-detect (<0.002 mg/L based) on three samples collected between January 2002 and September 2002.

The MEC for nitrate (as Nitrogen) was 47 mg/L, based on four samples collected from October 2006 to October 2008, while the maximum observed receiving water concentration was 2.2 mg/L, based on three samples collected from January 2002 to September 2002.

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. 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.

(c) WQBELs. The steps to derive the WQBELs are described above in Section IV.C.3.e.vi (a) of this Fact Sheet. As discussed in Section IV.C.2.d, above, the Discharger completed a dilution/mixing zone study. Using a 20:1 dilution credit, results in an AMEL for nitrate plus nitrite of 210 mg/L. However, because the Facility is capable of providing full nitrification/denitrification resulting in little or no nitrate or nitrite in the discharge, a dilution credit is not allowed. Therefore, this Order contains a final average monthly effluent limitation for nitrate plus nitrite of 10 mg/L, based on the Basin Plan's narrative chemical constituents' objective and to assure the treatment process adequately nitrifies and denitrifies the waste stream.

(d) Plant Performance and Attainability. Analysis of the effluent data shows that the MEC for nitrate (as N) was 47 mg/L based on four samples collected from October 2006 to December 2008. However, this data point appears to be an outlier since the other three effluent samples ranged from 1.8 mg/L to 2 mg/L, but there is insufficient data to statistically determine if it is an outlier. However, based on the treatment system, the Facility should be capable of meeting the effluent limitation for nitrate plus

nitrite. The Regional Water Board concludes, therefore, that immediate compliance with this effluent limitation is feasible.

vii. Pathogens

(a) WQO. The beneficial uses of the Sacramento River include municipal and domestic supply, water contact recreation, and agricultural irrigation supply. In a letter to the Regional Water Board dated 8 April 1999, DPH indicated it 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. Municipal and domestic supply, agricultural irrigation, and body contact water recreation are beneficial uses of the Sacramento River and there is at all times at least 20:1 dilution in the Sacramento River. Therefore, the DPH requirements are applicable to the discharge

(b) RPA Results. Domestic sewage contains pathogens. The principal infectious agents (pathogens) that may be present in raw sewage may be classified into three broad groups: bacteria, parasites, and viruses. The Regional Water Board finds that wastewater must be disinfected and adequately treated to prevent disease. Failure of the Facility's disinfection process could result in the discharge of pathogens, therefore, the Regional Water Board finds there is reasonable potential for pathogens.

(c) WQBELs. The previous Order contained an effluent total coliform monthly median limitation of 23 MPN/100 mL and a daily maximum limitation of 500 MPN/100 mL. The effluent limitations for total coliform have been modified in this Order to be consistent with DPH recommendations. This Order includes effluent limitations for total coliform of 23 MPN/100mL as a 7-day median, and 240 MPN/100 mL, that should not be exceed more than once in any 30 day period. These coliform limits are imposed to protect the beneficial uses of the receiving water, including public health through contact recreation and drinking water pathways.

In addition to coliform limitations, turbidity specifications 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 specification 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. Thus, monitoring turbidity is a good operational check to ensure the treatment system was functioning properly and could meet the limits for total coliform organisms. Therefore, to ensure compliance with DPH recommended Title 22 disinfection criteria, this Order contains operational turbidity specifications to be met prior to disinfection (See Special Provisions VI.C.4.a Turbidity Operational Requirements in the Limitations and Discharge Requirements section of this Order). To be consistent with current DPH guidance the operational requirements for turbidity have been established as 2 NTU as a daily average, an instantaneous maximum of 10 NTU, and shall not exceed 5 NTU more than 5 percent of the time within a 24-hour period.

This Order contains effluent limitations and a tertiary level of treatment, or equivalent, necessary to protect the beneficial uses of the receiving water. The Regional Water Board has previously considered the factors in CWC section 13241 in establishing these requirements.

(d) Plant Performance and Attainability. Analysis of the effluent data shows that the MEC of 170 MPN/100 mL is less than the applicable WQBELs. The Regional Water Board concludes, therefore, that immediate compliance with these effluent limitations is feasible.

viii. pH

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

(b) RPA Results. The discharge of treated municipal wastewater has a reasonable potential to cause or contribute to an excursion above the Basin Plan's numeric objectives for pH.

(c) WQBELs. Effluent limitations for pH of 6.5 as an instantaneous minimum and 8.5 as an instantaneous maximum are included in this Order based on protection of the Basin Plan objectives for pH.

(d) Plant Performance and Attainability. Analysis of the effluent data shows that the Facility is within the applicable WQBELs. The Regional Water Board concludes, therefore, that immediate compliance with these effluent limitations is feasible.

ix. Temperature

(a) WQO. The Thermal Plan requires that, "*The maximum temperature shall not exceed the natural receiving water temperature by more than 20°F.*"

nor the temperature "*Shall cause a surface water temperature rise greater than 4°F above the natural temperature of the receiving waters at any time or place.*"

(b) RPA Results. The discharge of treated municipal wastewater has a reasonable potential to cause or contribute to an excursion above Thermal Plan requirements.

(c) WQBELs. To ensure compliance with the Thermal Plan, an effluent limitation for temperature is included in this Order.

(d) Plant Performance and Attainability. Analysis of the effluent data shows that the Facility is within the applicable WQBELs. The Regional Water Board concludes, therefore, that immediate compliance with these effluent limitations is feasible.

4. WQBEL Calculations

a. This Order includes WQBELs for aluminum, ammonia, copper, iron, nitrate plus nitrite, total coliform organisms, and pH. The general methodology for calculating WQBELs based on the different criteria/objectives is described in subsections IV.C.4.b through e, below.

b. Effluent Concentration Allowance. For each water quality criterion/objective, the ECA is calculated using the following steady-state mass balance equation from Section 1.4 of the SIP:

$ECA = C + D(C - B)$ *where* $C>B$, *and*
$ECA = C$ *where* $C \leq B$

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

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

c. Basin Plan Objectives and MCLs. For WQBELs based on site-specific numeric Basin Plan objectives or MCLs, the effluent limitations are applied directly as the

ECA as either an MDEL, AMEL, or average annual effluent limitations, depending on the averaging period of the objective.

d. **Aquatic Toxicity Criteria.** WQBELs based on acute and chronic aquatic toxicity criteria are calculated in accordance with Section 1.4 of the SIP. The ECAs are converted to equivalent long-term averages (i.e. LTA_{acute} and $LTA_{chronic}$) using statistical multipliers and the lowest LTA is used to calculate the AMEL and MDEL using additional statistical multipliers.

e. Human Health Criteria. WQBELs based on human health criteria, are also calculated in accordance with Section 1.4 of the SIP. The ECAs are set equal to the AMEL and a statistical multiplier was used to calculate the MDEL.

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

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

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

where:
multAMEL = statistical multiplier converting minimum LTA to AMEL
multMDEL = statistical multiplier converting minimum LTA to MDEL
MA = statistical multiplier converting acute ECA to LTA_{acute}
MC = statistical multiplier converting chronic ECA to $LTA_{chronic}$

Table F-9. WQBEL Calculations for Aluminum

	Acute	Chronic
Criteria (µg/L) [1]	750	750
Dilution Credit	No Dilution	No Dilution
WER	1.0	1.0
ECA	750	750
ECA Multiplier	0.431	0.636
LTA	323.1	476.8
AMEL Multiplier (95th%)	1.40	[2]
AMEL (µg/L)	**443**	[2]
MDEL Multiplier (99th%)	2.30	[2]
MDEL (µg/L)	**750**	[2]

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

Table F-10. WQBEL Calculations for Ammonia

	Acute	30-day Chronic	4-day Chronic
Criteria (µg/L) [1]	2.14	1.94	4.86
Dilution Credit	0	0	0
ECA	2.14	1.94	4.86
ECA Multiplier	0.321	0.728[2]	0.527
LTA	0.69	1.42	2.56
AMEL Multiplier (95th%)	1.55	[3]	[3]
AMEL (µg/L)	**1.1**	[3]	[3]
MDEL Multiplier (99th%)	3.11	[3]	[3]
MDEL (µg/L)	**2.1**	[3]	[3]

[1] USEPA Ambient Water Quality Criteria
[2] Calculated based on the TSD modification presented in the 22 December 1999 Federal Register notice where $\sigma^2 = \ln(CV^2/30 + l)$
[3] …Limitations based on acute LTA (Acute LTA < Chronic LTA)

Table F-11. WQBEL Calculations for Copper

	Acute	Chronic	Basin Plan
Criteria (µg/L) Dissolved	7.0[1]	5.0[1]	10[2]
Dilution Credit	20	20	20
Translator[3]	0.96	0.96	0.96
Criteria (µg/L) Total Recoverable	7.6	5.2	10.4
ECA	65	20.3	N/A
ECA Multiplier	0.66	0.81	N/A
LTA	42.7	16.4	N/A
AMEL Multiplier (95th%)	*	1.2	--
AMEL (µg/L)	*	**19**	--
MDEL Multiplier (99th%)	*	1.6	--
MDEL (µg/L)	*	**25**	130.8

1. CTR aquatic life criteria, based on the lowest observed upstream receiving water hardness of 50 mg/L as $CaCO_3$ at Hood.
2. Basin Plan site-specific objective for the Delta.
3. EPA Translator used as default.
4. Limitations based on chronic LTA (chronic LTA < acute LTA).

Summary of Water Quality-Based Effluent Limitations
Discharge Point No. 001

Table F-12. Summary of Water Quality-Based Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Aluminum, Total Recoverable	µg/L	443	200[1]	750	--	--
Ammonia (as N)	mg/L	1.1	--	2.1	--	--
	lbs/day[3]	9	--	18	--	--
Copper, Total Recoverable	µg/L	19	--	25	--	--
Iron, Total Recoverable	µg/L	--	--	300	--	--
Nitrate + Nitrite	µg/L	10	--	--	--	--
pH	Standard Units	--	--	--	6.5	8.5
Acute Toxicity	%	70[3]	--	90[3]	--	--
Temperature	°F	--	--	[6]	--	--
Total Coliform Organisms	MPN/100mL	--	23[4]	240[5]	--	--

1. Annual average.
2. Based on maximum permitted flow of 1.0 mgd.
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 days.
4. 7-day median
5. Shall not be exceeded more than once in any 30-day period.
6. The maximum effluent temperature shall not exceed the natural receiving water temperature by more than 20°F.

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.

b. Acute Aquatic Toxicity. The Basin Plan contains a narrative toxicity objective that states, "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at page III-8.00) The Basin Plan also states that, *"…effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate…*" USEPA Region 9 provided guidance for the development of acute toxicity effluent limitations in the absence of numeric water quality objectives for toxicity in its document titled "Guidance for NPDES Permit Issuance", dated February 1994. In section B.2. "Toxicity Requirements" (pgs. 14-15) it states that, "*In the absence of specific numeric water quality objectives for acute and chronic toxicity, the narrative criterion 'no toxics in toxic amounts'*

applies. Achievement of the narrative criterion, as applied herein, means that ambient waters shall not demonstrate for acute toxicity: 1) less than 90% survival, 50% of the time, based on the monthly median, or 2) less than 70% survival, 10% of the time, based on any monthly median. For chronic toxicity, ambient waters shall not demonstrate a test result of greater than 1 TUc." Accordingly, effluent limitations for acute toxicity have been included in this Order as follows:

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

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

c. **Chronic Aquatic Toxicity.** The Basin Plan contains a narrative toxicity objective that states, "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at page III-8.00) Based on chronic WET testing performed by the Discharger from 19 October 2006 through 24 July 2008, the discharge does not have reasonable potential to cause or contribute to an in-stream excursion above of the Basin Plan's narrative toxicity objective. A dilution credit of 20:1 has been granted for the chronic condition. Therefore, chronic toxicity testing results exceeding 20 chronic toxicity unit (TUc) demonstrates the discharge has a reasonable potential to cause or contribute to an exceedance of the Basin Plan's narrative toxicity objective. As shown in Table F-13, below, the chronic whole effluent toxicity testing for 2007 and 2008 demonstrates that the discharge does not have reasonable potential to cause or contribute to an exceedance of the Basin Plan's narrative toxicity objective.

Table F-13. Chronic Toxicity Results

Date	Chronic Toxicity Unit (TUc)				
	Ceriodaphnia dubia		Pimephales promelas		Selenastrum capricornutum
	Survival	Reproduction	Survival	Growth	Growth
19 April 2007	--	--	--	--	1
19 April 2007	1	1	1	1	--
21 July 2008	--	--	--	--	1
24 July 2008	1	1	1	1	--

The Monitoring and Reporting Program of this Order requires annual chronic WET monitoring for demonstration of compliance with the narrative toxicity objective. In addition to WET monitoring, the Special Provision in section VI.C.2.a of the Order requires the Discharger to conduct a Toxicity Reduction Evaluation (TRE), in accordance with an approved TRE work plan, if the discharge demonstrates toxicity exceeding the numeric monitoring trigger (16 TUc). The numeric toxicity monitoring trigger is not an effluent limitation, it is the

toxicity threshold at which the Discharger is required to perform accelerated chronic toxicity monitoring, as well as the threshold to initiate a TRE if effluent toxicity has been demonstrated.

D. Final Effluent Limitations

1. Mass-based Effluent Limitations

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 of this Order.

2. Averaging Periods for Effluent Limitations

40 CFR 122.45 (d) requires average weekly and average monthly discharge limitations for publicly owned treatment works (POTWs) unless impracticable. However, for toxic pollutants and pollutant parameters in water quality permitting, USEPA 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 aluminum and ammonia 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_5, TSS, pH, and coliform, 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 section IV.C.3 of this Fact Sheet.

For effluent limitations based on Primary and Secondary MCLs, except nitrate and nitrite, this Order includes annual average effluent limitations. The Primary and 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 effluent limitations in this Order are less stringent than those in the previous permit, Order No. R5-2007-0092. However, since the issuance of Order No. R5-2004-0092, the Discharger upgraded the Facility to provide a higher level of treatment resulting in lower constituent concentrations in the effluent. Based upon this new information and as discussed below, this relaxation of effluent limitations is consistent with anti-backsliding requirements of the CWA and federal regulations.

The previous permit, Order No. R5-2004-0092 established effluent limitations for bis (2-ethylhexyl) phthalate, chloride, chlorine, chloroform, chlorodibromomethane, cyanide, dichlorobromomethane, foaming agents (MBAS), manganese, oil and grease, settleable solids, organochlorine pesticides, nitrite (as N), and 1,2-diphenylhydrazine. Since adoption of the previous permit the Discharger constructed a new "state-of-the-art" treatment facility that significantly increased the level of treatment. Effluent monitoring data collected since operation of the new facility were well below the applicable water quality objectives or not detected for these constituents. The Facility upgrade and monitoring data submitted by the Discharger is considered new information. Based on new information gathered over the term of Order No. R5-2004-0092, the discharge does not demonstrate reasonable potential to exceed the applicable water quality criteria/objective for these constituents. The removal of these effluent limitations is consistent with the anti-backsliding provisions, and the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution 68-16. Any impact on existing water quality will be insignificant.

The effluent limitations for aluminum in this Order are less stringent than the effluent limitations required in Order No. R5-2004-0092. The previous permit contained monthly average and maximum daily effluent limitations for aluminum of 71 µg/L and 142 µg/L, respectively. These effluent limitations were established based on the NAWQC for protection of freshwater aquatic life to interpret the Basin Plan's narrative toxicity objective. However, upon evaluation of site-specific conditions of the Sacramento River (see Section IV.C.3.e.i of this Fact Sheet for discussion) the Regional Water Board has determined that the chronic aquatic life criterion for aluminum is not applicable, which results in less stringent effluent limits. The relaxation of the effluent limits for aluminum is consistent with federal antibacksliding regulations. The change is based on new information, such as the Utah Department of Environmental Quality recommendations and aluminum WER studies for other major dischargers within the Delta. Furthermore, the Discharger has been unable to comply with the more stringent effluent limitations and ~~T~~the effluent aluminum concentrations are less than the receiving water concentrations, therefore, the relaxation of the aluminum effluent limitations is ~~not an antidegradation issue. Therefore, the relaxation of the aluminum effluent limitations is~~ consistent with antidegradation requirements.

4. Satisfaction of Antidegradation Policy

This Order does not allow for an increase in flow or mass of pollutants to the receiving water. Therefore, a complete antidegradation analysis is not necessary. The Order requires compliance with applicable federal technology-based standards and with WQBELs where the discharge could have the reasonable potential to cause or contribute to an exceedance of water quality standards. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant due to the relatively small size of the discharge in relation to the size of the receiving water and the level of treatment of the effluent.

This Order allows a mixing/dilution zone in accordance with the Basin Plan, the SIP, and EPA's *Water Quality Standards handbook, 2d Edition* (updated July 2007) and EPA's *Technical Support Document for Water Quality-Based Toxics Control*. As discussed in Finding IV.C.2.d of this Fact Sheet (Assimilative Capacity/Mixing Zone), the mixing zone complies with all applicable requirements. The mixing zone will not be adverse to the purpose of the state and federal antidegradation policies.

5. Stringency of Requirements for Individual Pollutants

This Order contains both technology-based effluent limitations and WQBELs for individual pollutants. The technology-based effluent limitations consist of restrictions on BOD_5, TSS, and pH. The WQBELs consist of restrictions on pathogens, aluminum, ammonia, copper, iron, and nitrate plus nitrite. This Order's technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements. In addition, this Order includes effluent limitations for pathogens to meet numeric objectives or protect beneficial uses. The rationale for including these limitations is explained in the Fact Sheet. In addition, the Regional Water Board has considered the factors in CWC section 13241 in establishing these requirements.

WQBELs 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 WQBELs were derived from the CTR, the CTR is the applicable standard pursuant to 40 CFR 131.38. The scientific procedures for calculating the individual WQBELs for priority pollutants are based on the CTR-SIP, which was approved by USEPA on 18 May 2000. All beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by USEPA prior to 30 May 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to 30 May 2000, but not approved by USEPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to 40 CFR 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the requirements of the CWA.

Summary of Final Effluent Limitations
Discharge Point No. 001

Table F-14. Summary of Final Effluent Limitations

Parameter	Units	Effluent Limitations					Basis
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
Biochemical Oxygen Demand, 5-day @ 20°C (BOD_5)	mg/L	10	--	20	--	--	
	lbs/day[4]	83	--	167	--	--	
Total Suspended Solids (TSS)	mg/L	10	--	20	--	--	
	lbs/day[4]	83	--	167	--	--	
Total Coliform Organisms	MPN/100ml	--	23[1]	240[6]	--	--	
Electrical Conductivity (EC)	µmhos/cm	1,500[2]	--	--	--	--	
Aluminum, Total Recoverable	µg/L	443	200[2]	750	--	--	
Ammonia (as N)	mg/L	1.1	--	2.1	--	--	
	lb/day	9	--	18	--	--	
Iron, Total Recoverable	µg/L	--	--	300	--	--	
Copper, Total Recoverable	µg/L	19	--	25	--	--	
Nitrate + Nitrite (as N)	mg/L	10	--	--	--	--	
pH	Standard Units	--	--	--	6.5	8.5	
Temperature	°F	--	--	[3]	--	--	
Flow	mgd	--	--	1.0	--	--	
Acute Toxicity[5]	% Survival	--	--	--	--	--	

1 7-day median.
2. Annual average.
3. The maximum effluent temperature shall not exceed the natural receiving water temperature by more than 20 °F.
4. Based on a design average dry weather flow of 1.0 mgd.
5. Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:
   70%, minimum for any one bioassay; and
   90%, median for any three consecutive bioassays.
6. Effluent total coliform concentration shall not exceed 240 MPN/100mL more than once in any 30-day period.

E. Interim Effluent Limitations

1. **Mercury.** See Section IV.C.3.d.vii for the rationale for the interim mass-based effluent limitation for mercury.

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 Water Board will apply to regional waters in order to protect the beneficial uses.*" The Basin Plan includes numeric and narrative water quality objectives for various beneficial uses and water bodies. This Order contains receiving surface water limitations based on the Basin Plan numerical and narrative water quality objectives for bacteria, biostimulatory substances, color, chemical constituents, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, salinity, suspended sediments, settleable substances, suspended material, tastes and odors, temperature, toxicity, and turbidity.

B. Groundwater

1. The discharge shall not cause the groundwater to exceed water quality objectives unreasonably affect beneficial uses, or cause a condition of pollution or nuisance.

2. The previous Order contained groundwater limitations. This Order carries forward the following groundwater limitations:

Release of waste constituents from any storage, treatment, or disposal component associated with the Facility shall not, in combination with other sources cause the following in groundwater:

a. Adversely impact beneficial uses or exceed water quality objectives.

b. Contain chemicals, heavy metals, or trace elements in concentrations that adversely affect beneficial uses or exceed maximum contaminant levels specified in 22 CCR, Division 4, Chapter 15.

c. Exceed concentrations of radionuclides specified in 22 CCR, Division 4, Chapter 15.

d. Contain concentrations of chemical constituents in amounts that adversely affect agricultural use.

e. Equal or exceed total coliform organisms of 2.2 MPN/100 Ml over any 7-day period.

f. Exhibit a pH or less than 6.5 or greater than 8.4 pH units.

g. Impart taste, odor, toxicity, or color that creates nuisance or impairs any beneficial use.

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

40 CFR 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 (Attachment E) of this Order, establishes monitoring and reporting requirements to implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the Monitoring and Reporting Program for the 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_5 and TSS reduction requirements). Continuous flow monitoring, weekly flow monitoring for BOD_5, TSS, and pH and monthly monitoring for electrical conductivity have been retained from Order No. R5-2004-0092.

B. Effluent Monitoring

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

2. Effluent monitoring frequencies and sample types for flow, BOD_5, pH, TSS, bis (2-ethyhexyl) phthalate, 1,2-diphenylhydrazine, mercury (total recoverable), dissolved oxygen, oil and grease, total coliform organisms, total dissolved solids, acute toxicity, priority pollutants, ammonia, chlorine, dissolved oxygen, and iron have been retained from Order No. R5-2004-0092.

3. The monitoring frequency for settleable solids has changed to monthly.

4. The sample types for aluminum, chloride, copper, electrical conductivity, iron, total dissolved solids, and acute toxicity has changed to 24-hour composite.

5. Monitoring for temperature, hardness (as $CaCO_3$), methyl mercury, and standard minerals have been added to be consistent with recently adopted NPDES permits.

6. Reporting of effluent in mass units for aluminum, ammonia, chloride, and iron have not been retained from Order No. R5-2004-0092. Federal regulations require mass limitations for POTWs, but include specific exceptions. 40 CFR section 122.25(f)(1)(ii) states that mass limitations are not required when applicable standards are expressed in terms of other units of measurement (e.g., concentration). Pursuant to 40 CFR section 122.25(f)(1)(ii), expressing the effluent limitations in terms of concentration is expressly allowed. This Order does not require mass limitations for constituents, except for oxygen demanding substances, bioaccumulative substances, and constituents with an associated 303(d) listing. Therefore, the reporting of aluminum, ammonia, chloride, and iron in mass units is unnecessary.

7. Monitoring data collected over the existing permit term for chlorodibromomethane, chloroform, cyanide, dichlorobromomethane, manganese, and foaming agents (MBAS) did not demonstrate reasonable potential to exceed water quality objectives/criteria. Thus, specific monitoring requirements for these parameters have not been retained from Order No. R5-2004-0092.

8. The Discharger currently does not have the ability to continuously measure effluent turbidity. The Discharger is allowed up to 120 days after the adoption of the Order to obtain and install the necessary equipment to continuously measure effluent turbidity.

C. Whole Effluent Toxicity Testing Requirements

1. **Acute Toxicity.** Consistent with the previous Order, quarterly 96-hour bioassay testing is required to demonstrate compliance with the effluent limitation for acute toxicity.

2. **Chronic Toxicity.** Consistent with the previous Order, annual 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

a. Receiving water monitoring is necessary to assess compliance with receiving water limitations and to assess the impacts of the discharge on the receiving stream.

b. Quarterly monitoring for priority pollutants upstream of Discharge Point No. 001 at RSW-001 is required during the third year of the permit term to collect the necessary data to determine reasonable potential as required in section 1.2 of the SIP. The pH and hardness (as $CaCO_3$) of the upstream receiving water shall also be monitored concurrently with the priority pollutants to ensure the water quality criteria/objectives are correctly adjusted for the receiving water when determining reasonable potential as specified in Section 1.3 of the SIP.

E. Ultraviolet (UV) Disinfection System Monitoring

UV System specifications and monitoring and reporting are required when the UV system becomes operational to ensure that adequate UV dosage is applied to the wastewater to inactivate pathogens (e.g., viruses in the wastewater). UV Disinfection System monitoring is imposed pursuant to requirements established by the California Department of Public Health (DPH) and the National Water Research Institute (NWRI) and American Water Works Association Research Foundation (NWRI/AWWRF's *"Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse").*

F. Other Monitoring Requirements

1. Biosolids Monitoring

Biosolids monitoring is required to ensure compliance with the biosolids disposal requirements contained in the Special Provision contained in section VI.C.6.c of this Order. Biosolids disposal requirements are imposed pursuant to 40 CFR Part 503 to protect public health and prevent groundwater degradation.

2. Emergency Storage Basin Monitoring

Emergency storage basin monitoring is required to ensure compliance with the pond operating requirements contained in the Special Provision, section VI.C.4.b, of this Order.

The Discharger currently does not have the ability to measure the volume of wastewater directed to the emergency storage basin. The Discharger is allowed up to 120 days after the adoption of the Order to obtain and install the necessary equipment to measure the approximate volume of the wastewater directed to the Emergency Storage Basin.

3. 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 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment D. The discharger must comply with all standard provisions and with those additional conditions that are applicable under 40 CFR 122.42.

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

B. Special Provisions

1. Reopener Provisions

a. Mercury. This provision allows the Regional Water Board to reopen this Order in the event mercury is found to be causing toxicity based on acute or chronic toxicity test results, or if a TMDL program is adopted. In addition, this Order may be reopened if the Regional Water Board determines that a mercury offset program is feasible for dischargers subject to NPDES permits.

b. Pollution Prevention. This Order requires the Discharger to prepare and implement a pollution prevention plan for mercury in accordance with 13263.3(d)(3). This reopener provision allows the Regional Water Board to reopen this Order for addition and/or modification of effluent limitations and requirements for these constituents based on a review of the pollution prevention plans.

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). This Order may be reopened to include a numeric chronic toxicity limitation, a new acute toxicity limitation, and/or a limitation for a specific toxicant identified in the TRE. Additionally, if a numeric chronic toxicity water quality objective is adopted by the State Water Board, this

Order may be reopened to include a numeric chronic toxicity limitation based on that objective.

d. **Water Effects Ratio (WER) and Metal Translators.** A default WER of 1.0 has been used in this Order for calculating CTR criteria for applicable priority pollutant inorganic constituents. If the Discharger performs studies to determine site-specific WERs and/or site-specific dissolved-to-total metal translators, this Order may be reopened to modify the effluent limitations for the applicable inorganic constituents.

e. **Reclamation Feasibility Study.** This Order requires the Discharger to complete and submit a report on the results of a feasibility evaluation for the reclamation of treated effluent to the Trilogy Golf Course. Based on a review of the results of the Reclamation Feasibility Study, this Order may be reopened to include additional requirements to implement reclamation to the Trilogy Golf Course if the Discharger determines that reclamation is feasible.

2. Special Studies 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 page III-8.00). Based on annual whole effluent chronic toxicity testing performed by the Discharger from April 2007 through July 2008, the discharge does not have reasonable potential to cause or contribute to an in-stream excursion above of the Basin Plan's narrative toxicity objective.

The Monitoring and Reporting Program of this Order requires 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, requirements for accelerated monitoring, and requirements for TRE initiation if toxicity is demonstrated.

Monitoring Trigger. A numeric toxicity monitoring trigger of > 16 TUc (where TUc = 100/NOEC) is applied in the provision, because this Order allows dilution for the chronic condition (see Section IV.C.2.d of the Fact Sheet). Therefore, a TRE is triggered when the effluent exhibits toxicity at 6.25% effluent.

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 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 in a six-week period (i.e., one test 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 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:

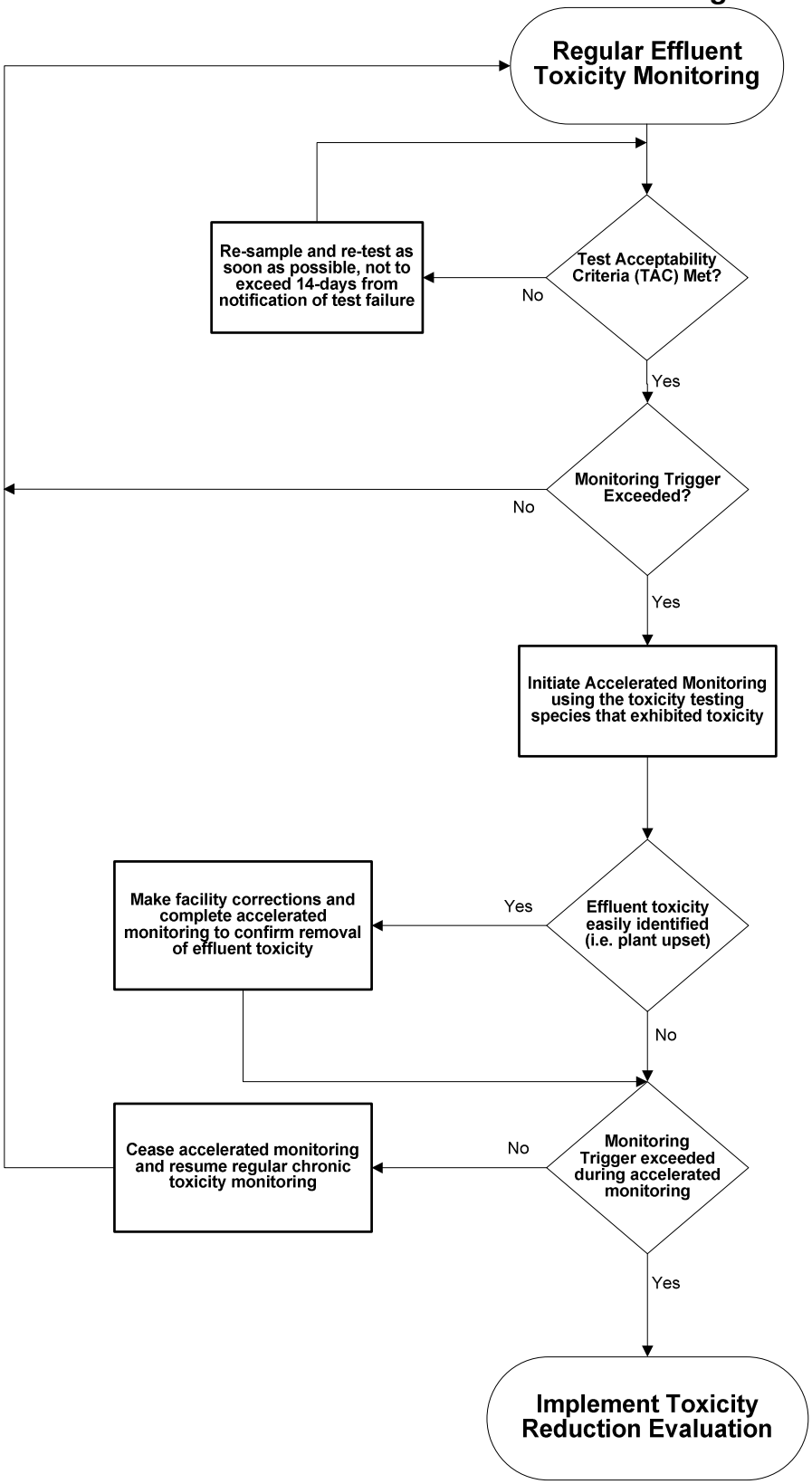
- Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants, EPA/833-B-99/002, August 1999.
- Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations (TREs), EPA/600/2-88/070, April 1989.
- Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures, Second Edition, EPA 600/6-91/003, 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



b. Water Reclamation Study. A water reclamation study is required to evaluate the beneficial reuse for uses including (but not limited to) landscape irrigation on the Trilogy Golf Course.

3. Best Management Practices and Pollution Prevention

a. CWC section 13263.3(d)(3) Pollution Prevention Plans. A pollution prevention plan for mercury is required in this Order per CWC section 13263.3(d)(1)(C). The pollution prevention plan required in section VI.C.3.a of this Order, shall, at a minimum, meet the requirements outlined in CWC section 13263.3(d)(3). The minimum requirements for the pollution prevention plans include the following:

i. An estimate of all of the sources of a pollutant contributing, or potentially contributing, to the loadings of a pollutant in the treatment plant influent.

ii. An analysis of the methods that could be used to prevent the discharge of the pollutants into the Facility, including application of local limits to industrial or commercial dischargers regarding pollution prevention techniques, public education and outreach, or other innovative and alternative approaches to reduce discharges of the pollutant to the Facility. The analysis also shall identify sources, or potential sources, not within the ability or authority of the Discharger to control, such as pollutants in the potable water supply, airborne pollutants, pharmaceuticals, or pesticides, and estimate the magnitude of those sources, to the extent feasible.

iii. An estimate of load reductions that may be attained through the methods identified in subparagraph ii.

iv. A plan for monitoring the results of the pollution prevention program.

v. A description of the tasks, cost, and time required to investigate and implement various elements in the pollution prevention plan.

vi. A statement of the Discharger's pollution prevention goals and strategies, including priorities for short-term and long-term action, and a description of the Discharger's intended pollution prevention activities for the immediate future.

vii. A description of the Discharger's existing pollution prevention programs.

viii. An analysis, to the extent feasible, of any adverse environmental impacts, including cross-media impacts or substitute chemicals that may result from the implementation of the pollution prevention program.

ix. An analysis, to the extent feasible, of the costs and benefits that may be incurred to implement the pollution prevention program.

b. Salinity Evaluation and Minimization Plan. An Evaluation and Minimization Plan for salinity is required in this Order to ensure adequate measures are

developed and implemented by the Discharger to reduce the discharge of salinity to the Sacramento River. The annual reports shall be submitted in accordance with the Monitoring and Reporting Program (Attachment E, Section X.D.5).

4. Construction, Operation, and Maintenance Specifications

a. Ultraviolet (UV) Disinfection System Operating Specifications. UV System specifications and monitoring and reporting are required to ensure that adequate UV dosage is applied to the wastewater to inactivate pathogens (e.g., viruses in the wastewater). UV dosage is dependent on several factors such as UV transmittance, UV power setting, wastewater turbidity, and wastewater flow through the UV system. Monitoring and reporting of these parameters is necessary to determine compliance with minimum dosage requirements established by the California Department of Public Health (DPH) and the National Water Research Institute (NWRI) and American Water Works Association Research Foundation NWRI/AWWRF's *Últraviolet Disinfection Guidelines for Drinking Water and Water Reuse"* first published in December 2000 and revised as a Second Edition dated May 2003. In addition, a Memorandum dated 1 November 204 issued by DPH to Regional Board executive offices recommended that provisions be included in permits to water recycling treatment plants employing UV disinfection requiring Dischargers to establish fixed cleaning frequency if quartz sleeves as well as include provisions that specify minimum delivered UV dose that must be maintained (as recommended by the NWRI/AWWRF UV Disinfection Guidelines).

Turbidity is included as an operational specification as an indicator of the effectiveness of the treatment process and to assure compliance with effluent limitations for total coliform organisms. The tertiary treatment process utilized at this Facility is capable of reliably meeting a turbidity limitation of 2 nephelometric turbidity units (NTU) as a daily average. Failure of the treatment system such that virus removal is impaired would normally result in increased particles in the effluent, which result in higher effluent turbidity and could impact UV dosage. Turbidity has a major advantage for monitoring filter performance, allowing immediate detection of filter failure and rapid corrective action. The operational specification requires that turbidity prior to disinfection shall not exceed 2 NTU as a daily average; 5 NTU, more than 5 percent of the time within a 24-hour period, and an instantaneous maximum of 10 NTU.

Minimum UV dosage and turbidity specifications are included as operating criteria in Section VI.C.4.a of this Order and Section IX.C of the Monitoring and Reporting Program (Attachment E) to ensure that adequate disinfection of wastewater is achieved to protect beneficial uses.

The Discharger currently does not have the ability to measure turbidity for the effluent. The Discharger is allowed up to 120 days after the adoption of the Order to obtain and install the necessary equipment to measure effluent turbidity.

b. **Emergency Storage Pond Operating Specifications.** The emergency storage pond is utilized during times when the effluent does not meet discharge requirements through diversion from the UV disinfection system. The emergency storage pond is drained once operational issues are resolved, which is typically within 24 hours during wet weather and within a week during dry weather. The emergency storage pond is lined with a high density polyethylene liner. The operation and maintenance specification for the pond in this Order is necessary to protect the public and the beneficial uses of the groundwater and to prevent nuisance conditions.

5. **Special Provisions for Municipal Facilities (POTWs Only)**

a. **Pretreatment Requirements – NOT APPLICABLE**

b. **Sludge/Biosolids Discharge Specifications.** The sludge/biosolids provisions are required to ensure compliance with State disposal requirements (Title 27, CCR, Division 2, Subdivision 1, section 20005, et seq) and USEPA sludge/biosolids use and disposal requirements at 40 CFR Part 503.

c. **Collection System.** The State Water Board issued General Waste Discharge Requirements for Sanitary Sewer Systems, Water Quality Order No. 2006-0003-DWQ (General Order) on 2 May 2006. The General Order requires public agencies that own or operate sanitary sewer systems with greater than one mile of pipes or sewer lines to enroll for coverage under the General Order. The General Order requires agencies to develop sanitary sewer management plans (SSMPs) and report all sanitary sewer overflows (SSOs), among other requirements and prohibitions.

Furthermore, the General Order contains requirements for operation and maintenance of collection systems and for reporting and mitigating sanitary sewer overflows. Inasmuch that the Discharger's collection system is part of the system that is subject to this Order, certain standard provisions are applicable as specified in Provisions, section VI.C.5. For instance, the 24-hour reporting requirements in this Order are not included in the General Order. The Discharger must comply with both the General Order and this Order. The Discharger and public agencies that are discharging wastewater into the facility were required to obtain enrollment for regulation under the General Order by 1 December 2006.

6. **Other Special Provisions**

a. **Changes.** Prior to making any change in the discharge point, place of use, or purpose of use of the wastewater, the Discharger must obtain approval of, or clearance from the State Water Resources Control Board (Division of Water Rights).

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 – NOT APPLICABLE

VIII. PUBLIC PARTICIPATION

The Regional Water Board is considering the issuance of WDRs that will serve as an NPDES permit for the 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 direct mailing to agencies and known interested parties, posting of the NOPH at the Discharger's offices and the local post office and publication in the local newspaper.

B. Written Comments

The staff determinations are tentative. Interested persons are invited to submit written comments concerning these tentative WDRs. Comments 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 must be received at the Regional Water Board offices by 5:00 p.m. on **19 April 2010.**

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: **28/29/30 July 2010**
Time: 8:30 a.m.
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 www.waterboards.ca.gov/centralvalley where you can access the current agenda for changes in dates and locations.

D. Waste Discharge Requirements Petitions

Any aggrieved person may petition the State Water 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, related documents, tentative effluent limitations and special provisions, comments received, and other information are on file and may be inspected at the address above at any time between 8:30 a.m. and 4:45 p.m., Monday through Friday. Copying of documents may be arranged through the Regional Water Board by calling (916) 464-3291.

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 Elizabeth Lee at (916) 464-4787.

ATTACHMENT G – SUMMARY OF REASONABLE POTENTIAL ANALYSIS

Constituent	Units	MEC	B	C	CMC	CCC	Water & Org	Org. Only	Basin Plan	MCL	Reasonable Potential
Priority Pollutants											
Antimony	µg/L	<0.5	<0.02	6	None	None	14	4300	Narrative	6	N
Arsenic	µg/L	9.60	2.2	10	340	150	None	None	10	50	N
Beryllium	µg/L	<0.10	<0.06	4	None	None	None	None	Narrative	4	N
Cadmium	µg/L	<0.10	<0.04	2.24	4.3[2]	2.2[2]	None	None	Narrative	5	N
Chromium (total)	µg/L	<0.50	3.1	50	None	None	None	None	Narrative	50	N
Chromium (VI)	µg/L		<0.2	11	16.0	11.0	None	None	Narrative	50	N
Copper, Total Recoverable	µg/L	18	4.40	5.86	14.0[2]	9.33[2]	1300	None	10	10	Y
Lead	µg/L	0.25	0.52	1.38	64.58[2]	2.52[2]	None	None	15	15	N
Mercury	µg/L	0.0015	0.005	0.05	1.4	0.77	0.05	0.051	Narrative	2	Y[3]
Nickel	µg/L	1.00	5.5	52.0	468.2[2]	52.0[2]	610	4600	Narrative	100	N
Selenium	µg/L	1.50	<0.5	5	20.0	5.0	None	None	Narrative	50	N
Silver	µg/L	<0.10	<0.02	3.45	3.4[2]	None	None	None	10	100	N
Thallium	µg/L	<0.1	<0.03	1.7	None	None	1.7	6.3	Narrative	2	N
Zinc	µg/L	21.00	5	117.18	117.2[2]	118.1[2]	7400	2600	100	5000	N
Cyanide	µg/L	<3.00	3.00	5.2	22.0	5.2	700	220000	10	150	N
Asbestos	mfl		<0.20	7.0	None	None	7	None	Narrative	7.0	N
2,3,7,8-TCDD	pg/L		<2.3E-06	1.3E-08	None	None	1.3E-08	1.4E-09	Narrative	0.00003	N
Acrolein	µg/L	<5.00	<3.3	320	None	None	320	780	Narrative	None	N
Acrylonitrile	µg/L	<2.00	<1.6	0.059	None	None	0.059	0.66	Narrative	None	N
Benzene	µg/L	<0.5	<0.3	1	None	None	1.2	71	Narrative	1	N
Bromoform	µg/L	<0.50	<0.2	4.3	None	None	4.3	360	Narrative	80	N
Carbon tetrachloride	µg/L	<0.50	<0.42	0.25	None	None	0.25	4.4	Narrative	0.5	N
Chlorobenzene (mono chlorobenzene)	µg/L	<0.50	<0..3	70	None	None	680	21000	Narrative	70	N
Dibromochloromethane	µg/L	ND (<0.50)	<0.3	0.41	None	None	0.41	34	Narrative	80	N
Chloroethane	µg/L	<0.50	<0.34	[4]	None	None	None	None	Narrative	None	N
2- Chloroethyl vinyl ether	µg/L	<1.00	<0.32	[4]	None	None	None	None	Narrative	None	N
Chloroform	µg/L	ND (<2.5)	<0.31	80	None	None	None	None	Narrative	80	N

Constituent	Units	MEC	B	C	CMC	CCC	Water & Org	Org. Only	Basin Plan	MCL	Reasonable Potential
Bromodichloromethane	µg/L	ND (<0.50)	<0.20	0.56	None	None	0.56	46	Narrative	80	N
1,1-Dichloroethane	µg/L	<0.50	<0.34	5	None	None	None	None	Narrative	5	N
1,2-Dichloroethane	µg/L	<0.50	<0.2	0.38	None	None	0.38	99	Narrative	0.5	N
1,1-Dichloroethene	µg/L	<0.50	<0.49	0.057	None	None	0.057	3.2	Narrative	None	N
1,2-Dichloropropane	µg/L	<0.50	<0.22	0.52	None	None	0.52	39	Narrative	5	N
1,3-Dichloropropylene	µg/L	<0.50	<0.3	0.5	None	None	3100	29000	Narrative	0.5	N
Ethylbenzene	µg/L	<0.50	<0.4	300	None	None	3100	29000	Narrative	300	N
Bromomethane	µg/L	<0.50	<0.46	48	None	None	48	4000	Narrative	None	N
Chloromethane	µg/L	<0.50	<0.46	[4]	None	None	None	None	Narrative	None	N
Dichloromethane	µg/L	<0.50	<0.4	4.7	None	None	4.7	1600	Narrative	5	N
1,1,2,2-Tetrachloroethane	µg/L	<0.50	<0.30	0.17	None	None	0.17	11	Narrative	1	N
Tetrachloroethene	µg/L	<0.50	<0.44	0.8	None	None	0.8	8.85	Narrative	5	N
Toluene	µg/L	<0.50	0.32	150	None	None	6800	200000	Narrative	150	N
trans-1,2-Dichloroethylene	µg/L	<0.50	<0.43	[4]	None	None	700	140000	Narrative	10	N
1,1,1-Trichloroethane	µg/L	<0.50	<0.49	200	None	None	None	None	Narrative	200	N
1,1,2-Trichloroethane	µg/L	<0.50	<0.3	0.6	None	None	0.6	42	Narrative	5	N
Trichloroethene	µg/L	<0.50	<0.3	2.7	None	None	2.7	81	Narrative	5	N
Vinyl chloride	µg/L	<0.50	<0.47	0.5	None	None	2	525	Narrative	0.5	N
2-Chlorophenol	µg/L	<2.00	<0.03	120	None	None	120	400	Narrative	None	N
2,4-Dichlorophenol	µg/L	<1.00	<0.03	93	None	None	93	790	Narrative	None	N
2,4-Dimethylphenol	µg/L	<2.00	<0.04	540	None	None	540	2300	Narrative	None	N
4,6-Dinitro-2-methylphenol	µg/L	<5.00	<0.06	13.4	None	None	13.4	765	Narrative	None	N
2,4-Dinitrophenol	µg/L	<5.00	<0.16	70	None	None	70	14000	Narrative	None	N
2-Nitrophenol	µg/L	<5.00	<0.02	[4]	None	None	None	None	Narrative	None	N
4-Nitrophenol	µg/L	<5.00	<0.02	[4]	None	None	None	None	Narrative	None	N
4-Chloro-3-methylphenol	µg/L	<1.00	<0.03	[4]	None	None	None	None	Narrative	None	N
Pentachlorophenol	µg/L	<1.00	<0.02	0.28	19	15	0.28	8.2	Narrative	1	N
Phenol	µg/L	1.30	<0.30	21000	None	None	21000	460000	Narrative	None	N
2,4,6-Trichlorophenol	µg/L	<5.00	<0.02	2.1	None	None	2.1	6.5	Narrative	None	N
Acenaphthene	µg/L	<0.30	<0.17	1200	None	None	1200	2700	Narrative	None	N
Acenaphthylene	µg/L	<0.20	<0.04	[4]	None	None	None	None	Narrative	None	N
Anthracene	µg/L	<0.30	<0.16	9600	None	None	9600	110000	Narrative	None	N
Benzidine	µg/L	<5.00	<1.00	0.00012	None	None	0.00012	0.00054	Narrative	None	N

Constituent	Units	MEC	B	C	CMC	CCC	Water & Org	Org. Only	Basin Plan	MCL	Reasonable Potential
1,2-Benzanthracene	µg/L	<0.30	<0.12	0.0044	None	None	0.0044	0.049	Narrative	0.1	N
Benzo(a)pyrene (3,4-Benzopyrene)	µg/L	<0.30	<0.09	0.0044	None	None	0.0044	0.049	Narrative	0.2	N
3,4-Benzofluoranthene	µg/L	<0.30	<0.11	0.0044	None	None	0.0044	0.049	Narrative	None	N
Benzo(g,h,i)perylene	µg/L	<0.10	<0.07		None	None			Narrative	None	N
Benzo(k)fluoranthene	µg/L	<0.30	<0.16	0.0044	None	None	0.0044	0.049	Narrative	None	N
Bis(2-chloroethoxy) methane	µg/L	<5.00	<0.07	[4]	None	None	None	None	Narrative	None	N
Bis(2-chloroethyl) ether	µg/L	<1.00	<0.12	0.031	None	None	0.031	1.4	Narrative	None	N
Bis(2-chloroisopropyl) ether	µg/L	<2.00	<0.03	1400	None	None	1400	170000	Narrative	None	N
Bis(2-ethylhexyl)phthalate	µg/L	ND (<5)	<2	1.8	None	None	1.8	5.9	Narrative	4	N
4-Bromophenyl phenyl ether	µg/L	<5.00	<0.04	[4]	None	None	None	None	Narrative	None	N
Butyl benzyl phthalate	µg/L	<5.00	<0.04	3000	None	None	3000	5200	Narrative	None	N
2-Chloronaphthalene	µg/L	<5.00	<0.02	1700	None	None	1700	4300	Narrative	None	N
4-Chlorophenyl phenyl ether	µg/L	<5.00	<0.04	[4]	None	None	None	None	Narrative	None	N
Chrysene	µg/L	<0.30	<0.14	0.0044	None	None	0.0044	0.049	Narrative	None	N
Dibenzo(a,h)-anthracene	µg/L	<0.10	<0.07	0.0044	None	None	0.0044	0.049	Narrative	None	N
1,2-Dichlorobenzene	µg/L	<0.50	<0.2	600	None	None	2700	17000	Narrative	600	N
1,3-Dichlorobenzene	µg/L	<0.50	<0.3	400	None	None	400	2600	Narrative	None	N
1,4-Dichlorobenzene	µg/L	<0.50	<0.3	5	None	None	400	2600	Narrative	5	N
3,3'-Dichlorobenzidine	µg/L	<5.00	<0.20	0.04	None	None	0.04	0.077	Narrative	None	N
Diethyl phthalate	µg/L	<2.00	<0.25	23000	None	None	23000	120000	Narrative	None	N
Dimethyl phthalate	µg/L	<2.00	0.30	313000	None	None	313000	290000	Narrative	None	N
Di-n-butylphthalate	µg/L	<5.00	1.70	2700	None	None	2700	12000	Narrative	None	N
2,4-Dinitrotoluene	µg/L	<5.00	<0.04	0.11	None	None	0.11	9.1	Narrative	None	N
2,6-Dinitrotoluene	µg/L	<5.00	<0.06	[4]	None	None	None	None	Narrative	None	N
Di-n-octylphthalate	µg/L	<5.00	<0.10	[4]	None	None	None	None	Narrative	None	N
1,2-Diphenylhydrazine	µg/L	<5	<0.13	0.04	None	None	0.04	0.54	Narrative	None	N
Fluoranthene	µg/L	<0.05	<0.03	300	None	None	300	370	Narrative	None	N
Fluorene	µg/L	<0.10	<0.03	1300	None	None	1300	14000	Narrative	None	N
Hexachlorobenzene	µg/L	<1.00	<0.04	0.00075	None	None	0.00075	0.00077	Narrative	1	N
Hexachlorobutadiene	µg/L	<1.00	<0.01	0.44	None	None	0.44	50	Narrative	None	N
Hexachlorocyclopentadiene	µg/L	<5.00	<0.01	8	None	None	240	17000	Narrative	50	N
Hexachloroethane	µg/L	<1.00	<0.01	1.9	None	None	1.9	8.9	Narrative	None	N
Indeno(1,2,3-c,d)pyrene	µg/L	<0.05	<0.06	0.0044	None	None	0.0044	0.049	Narrative	None	N

Constituent	Units	MEC	B	C	CMC	CCC	Water & Org	Org. Only	Basin Plan	MCL	Reasonable Potential
Isophorone	µg/L	<1.00	<0.07	8.4	None	None	8.4	600	Narrative	None	N
Naphthalene	µg/L	<0.20	<0.05	[4]	None	None	None	None	Narrative	None	N
Nitrobenzene	µg/L	<1.00	<0.04	17	None	None	17	1900	Narrative	None	N
N-Nitrosodimethylamine	µg/L	<5.00	<1.00	0.00068	None	None	0.00069	8.1	Narrative	None	N
N-Nitrosodi-n-propylamine	µg/L	<5.00	<0.03	0.005	None	None	0.005	1.4	Narrative	None	N
N-Nitrosodiphenylamine	µg/L	<1.00	<0.05	5	None	None	5	16	Narrative	None	N
Phenanthrene	µg/L	<0.05	0.03	[43]	None	None	None	None	Narrative	None	N
Pyrene	µg/L	<0.05	<0.04	960	None	None	960	11000	Narrative	None	N
1,2,4-Trichlorobenzene	µg/L	<1.00	<0.4	5	None	None	260	940	Narrative	5	N
Aldrin	µg/L	<0.05	<0.003	0.00013	3	None	0.00013	0.00014	Narrative	None	N
Alpha-Hexachlorocyclohexane (BHC)	µg/L	<0.050	<0.003	0.0039	None	None	0.0039	0.013	Narrative	None	N
beta-Hexachlorocyclohexane	µg/L	<0.05	<0.004	0.014	None	None	0.014	0.046	Narrative	None	N
Lindane (gamma-BHC)	µg/L	<0.05	<0.003	0.019	0.95	None	0.019	0.063	Narrative	0.2	N
delta-Hexachlorocyclohexane	µg/L	<0.05	<0.002	[4]	None	None	None	None	Narrative	None	N
Chlordane	µg/L	<0.5	<0.005	0.00057	2.4	0.0043	0.00057	0.00059	Narrative	0.1	N
4,4'-DDT	µg/L	<0.1	<0.003	0.00059	1.1	0.001	0.00059	0.00059	Narrative	None	N
4,4'-DDE	µg/L	<0.1	<0.002	0.00059	None	0.001	0.00059	0.00059	Narrative	None	N
4,4'-DDD	µg/L	<0.1	<0.002	0.00083	None	0.001	0.00083	0.00084	Narrative	None	N
Dieldrin	µg/L	<0.1	<0.002	0.00014	0.24	0.056	0.00014	0.00014	Narrative	None	N
alpha-Endosulfan	µg/L	<0.05	<0.002	0.056	0.22	0.056	110	240	Narrative	None	N
beta-Endosulfan	µg/L	<0.1	<0.002	0.056	0.22	0.056	110	240	Narrative	None	N
Endolsulfan sulfate	µg/L	<0.1	<0.002	110	None	None	110	240	Narrative	None	N
Endrin	µg/L	<0.1	<0.002	0.036	0.086	0.036	0.76	0.81	Narrative	2	N
Endrin Aldehyde	µg/L	<0.05	<0.002	0.76	None	None	0.76	0.81	Narrative	None	N
Heptachlor	µg/L	<0.05	<0.003	0.00021	0.52	0.0038	0.00021	0.00021	Narrative	0.01	N
Heptachlor Epoxide	µg/L	<0.05	<0.002	0.0001	0.52	0.0038	0.0001	0.00011	Narrative	0.01	N
PCB-1016	µg/L	<0.10	<0.08	0.00017	None	None	0.00017	0.00017	Narrative	0.5	N
PCB-1221	µg/L	<0.10	<0.03	0.0002	0.73	0.0002	0.00073	0.00075	Narrative	0.5	N
PCB-1232	µg/L	<0.10	<0.04	0.0002	0.73	0.0002	0.00073	0.00075	Narrative	0.5	N
PCB-1242	µg/L	<0.10	<0.08	0.0002	0.73	0.0002	0.00073	0.00075	Narrative	0.5	N
PCB-1248	µg/L	<0.10	<0.05	0.0002	0.73	0.0002	0.00073	0.00075	Narrative	0.5	N
PCB-1254	µg/L	<0.10	<0.07	0.0002	0.73	0.0002	0.00073	0.00075	Narrative	0.5	N
PCB-1260	µg/L	<0.10	<0.05	0.0002	0.73	0.0002	0.00073	0.00075	Narrative	0.5	N

Constituent	Units	MEC	B	C	CMC	CCC	Water & Org	Org. Only	Basin Plan	MCL	Reasonable Potential
Toxaphene	µg/L	<1.00	<0.4	0.0002	0.73	0.0002	0.00073	0.00075	Narrative	3	N
Non-Conventional Pollutants											
cis-1,2-Dichloethene	µg/L	<0.50	<0.44	6	None	None	None	None	Narrative	6	N
Methyl-tert-butyl ether (MTBE)	µg/L	<0.50	0.8	5	None	None	None	None	Narrative	5	N
Trichlorofluoromethane	µg/L	<0.50	<0.48	150	None	None	None	None	Narrative	150	N
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	<1.00	<0.48	1200	None	None	None	None	Narrative	1200	N
Styrene	µg/L	<1.00	<0.4	10	None	None	None	None	Narrative	10	N
Xylenes	µg/L	<0.50	<0.40	20	None	None	None	None	Narrative	20	N
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	<1	<0.007	0.2	None	None	None	None	Narrative	0.2	N
Methoxychlor	µg/L	<0.5	<0.003	0.03	0.03	None	100	None	Narrative	30	N
Thioencarb	µg/L	<0.1	<0.45	1	3.1	None	None	None	Narrative	1	N
Diazinon	µg/L	<0.6	<0.1	0.05	0.080	0.050	None	None	Narrative	None	N
Chlorpyrifos	µg/L	<0.5	<0.1	0.014	0.020	0.014	None	None	Narrative	None	N
Aluminum	µg/L	100	800	200	750	87	None	None	Narrative	200	Y
Barium	µg/L	7.80	46	1000	None	None	None	None	Narrative	1000	N
Fluoride	µg/L	<1.00	400	2000	None	None	None	None	Narrative	2000	N
Iron	µg/L	200	1600	300	None	1000	None	None	Narrative	300	Y
Manganese	µg/L	11	33	50	None	None	None	100	Narrative	50	N
Tributyltin	µg/L	[5]	<2	0.072	0.46	0.072	None	None	Narrative	None	N
Ammonia	mg/L	0.36	0.3	1.06	2.14	1.06	30	None	Narrative	None	Y
Hardness	mg/L	130	94	[4]	None	None	None	None	None	None	N
Boron	µg/L	1200	[5]	[4]	None	None	None	None	None	None	N
Chloride	mg/L	260	14	106	860	230	None	None	Narrative	106	N
Foaming Agents (MBAS)	µg/L	59	<0.02	500	None	None	None	None	Narrative	500	N
Nitrate (as N)	mg/L	47	2.20	10	None	None	None	None	Narrative	10	Y
Nitrite (as N)	mg/L	<0.03	0.002	1	None	None	None	None	Narrative	1	N
Specific Conductance (EC)	µmhos/cm	1600	280	900	None	None	None	None	Narrative	900	N
Sulfite (as SO_3)	µg/L	<1.00	<0.073	[4]	None	None	None	None	Narrative	None	N
Total Dissolved Solids (TDS)	mg/L	1100	190	500	None	None	None	None	Narrative	500	N

General Note: All inorganic concentrations are given as a total recoverable.
MEC = Maximum Effluent Concentration
B = Maximum Receiving Water Concentration or lowest detection level, if non-detect
C = Criterion used for Reasonable Potential Analysis
CMC = Criterion Maximum Concentration (CTR or NTR)
CCC = Criterion Continuous Concentration (CTR or NTR)
Water & Org = Human Health Criterion for Consumption of Water & Organisms (CTR or NTR)
Org. Only = Human Health Criterion for Consumption of Organisms Only (CTR or NTR)
Basin Plan = Numeric Site-specific Basin Plan Water Quality Objective
MCL = Drinking Water Standards Maximum Contaminant Level
NA = Not Available
ND = Non-detect

Footnotes:
(1) USEPA National Recommended Ambient Water Quality Criteria
(2) Calculated using reported lowest effluent hardness of 100 mg/L as $CaCO_3$
(3) Demonstrates Reasonable Potential based on other information.
(4) No established criteria.
(5) No data.

ATTACHMENT H – EFFLUENT AND RECEIVING WATER CHARACTERIZATION STUDY

I. Background. Sections 2.4.1 through 2.4.4 of the SIP provide minimum standards for analyses and reporting. (Copies of the SIP may be obtained from the State Water Resources Control Board, or downloaded from http://www.waterboards.ca.gov/iswp/index.html). To implement the SIP, effluent and receiving water data are needed for all priority pollutants. Effluent and receiving water pH and hardness are required to evaluate the toxicity of certain priority pollutants (such as heavy metals) where the toxicity of the constituents varies with pH and/or hardness. Section 3 of the SIP prescribes mandatory monitoring of dioxin congeners. In addition to specific requirements of the SIP, the Regional Water Board is requiring the following monitoring:

A. Drinking water constituents. Constituents for which drinking water Maximum Contaminant Levels (MCLs) have been prescribed in the California Code of Regulation are included in the *Water Quality Control Plan, Fourth Edition, for the Sacramento and San Joaquin River Basins* (Basin Plan). The Basin Plan defines virtually all surface waters within the Central Valley Region as having existing or potential beneficial uses for municipal and domestic supply. The Basin Plan further requires that, at a minimum, water designated for use as domestic or municipal supply shall not contain concentrations of chemical constituents in excess of the MCLs contained in the California Code of Regulations.

B. Effluent and receiving water temperature. This is both a concern for application of certain temperature-sensitive constituents, such as fluoride, and for compliance with the Basin Plan's thermal discharge requirements.

C. Effluent and receiving water hardness and pH. These are necessary because several of the CTR constituents are hardness and pH dependent.

D. Dioxin and furan sampling. Section 3 of the SIP has specific requirements for the collection of samples for analysis of dioxin and furan congeners, which are detailed in Attachment I. Pursuant to Section 13267 of the California Water Code, this Order includes a requirement for the Discharger to submit monitoring data for the effluent and receiving water as described in Attachment I.

II. Monitoring Requirements.

A. Quarterly Monitoring. Quarterly priority pollutant samples shall be collected from the effluent and upstream receiving water (EFF-001 and RSW-001) and analyzed for the constituents listed in Table I-1. Quarterly monitoring shall be conducted for 1 year (1 sample every 3 months, evenly distributed throughout the year) and the results of such monitoring be submitted to the Regional Water Board, during the fourth year of the permit term. Each individual monitoring event shall provide representative sample results for the effluent and upstream receiving water.

B. Semi-annual Monitoring (dioxins and furans only). Semi-annual monitoring is required for dioxins and furans, as specified in Attachment I. The results of dioxin and furan monitoring shall be submitted to the Regional Water Board with the quarterly priority data at the completion of the Effluent and Receiving Water Characterization Study, and during the fourth year of the permit term.

C. Concurrent Sampling. Effluent and receiving water sampling shall be performed at approximately the same time, on the same date.

D. Sample type. All effluent samples shall be taken as 24-hour flow proportioned composite samples. All receiving water samples shall be taken as grab samples.

Table H-1. Priority Pollutants

CTR #	Constituent	CAS Number	Controlling Water Quality Criterion for Surface Waters		Criterion Quantitation Limit ug/L or noted	Suggested Test Methods
			Basis	Criterion Concentration ug/L or noted[1]		
VOLATILE ORGANICS						
28	1,1-Dichloroethane	75343	Primary MCL	5	0.5	EPA 8260B
30	1,1-Dichloroethene	75354	National Toxics Rule	0.057	0.5	EPA 8260B
41	1,1,1-Trichloroethane	71556	Primary MCL	200	0.5	EPA 8260B
42	1,1,2-Trichloroethane	79005	National Toxics Rule	0.6	0.5	EPA 8260B
37	1,1,2,2-Tetrachloroethane	79345	National Toxics Rule	0.17	0.5	EPA 8260B
75	1,2-Dichlorobenzene	95501	Taste & Odor	10	0.5	EPA 8260B
29	1,2-Dichloroethane	107062	National Toxics Rule	0.38	0.5	EPA 8260B
	cis-1,2-Dichloroethene	156592	Primary MCL	6	0.5	EPA 8260B
31	1,2-Dichloropropane	78875	Calif. Toxics Rule	0.52	0.5	EPA 8260B
101	1,2,4-Trichlorobenzene	120821	Public Health Goal	5	0.5	EPA 8260B
76	1,3-Dichlorobenzene	541731	Taste & Odor	10	0.5	EPA 8260B
32	1,3-Dichloropropene	542756	Primary MCL	0.5	0.5	EPA 8260B
77	1,4-Dichlorobenzene	106467	Primary MCL	5	0.5	EPA 8260B
17	Acrolein	107028	Aquatic Toxicity	21	2	EPA 8260B
18	Acrylonitrile	107131	National Toxics Rule	0.059	2	EPA 8260B
19	Benzene	71432	Primary MCL	1	0.5	EPA 8260B
20	Bromoform	75252	Calif. Toxics Rule	4.3	0.5	EPA 8260B
34	Bromomethane	74839	Calif. Toxics Rule	48	1	EPA 8260B
21	Carbon tetrachloride	56235	National Toxics Rule	0.25	0.5	EPA 8260B
22	Chlorobenzene (mono chlorobenzene)	108907	Taste & Odor	50	0.5	EPA 8260B
24	Chloroethane	75003	Taste & Odor	16	0.5	EPA 8260B
25	2- Chloroethyl vinyl ether	110758	Aquatic Toxicity	122 (3)	1	EPA 8260B
26	Chloroform	67663	OEHHA Cancer Risk	1.1	0.5	EPA 8260B
35	Chloromethane	74873	USEPA Health Advisory	3	0.5	EPA 8260B

CTR #	Constituent	CAS Number	Controlling Water Quality Criterion for Surface Waters		Criterion Quantitation Limit ug/L or noted	Suggested Test Methods
			Basis	Criterion Concentration ug/L or noted[1]		
23	Dibromochloromethane	124481	Calif. Toxics Rule	0.41	0.5	EPA 8260B
27	Dichlorobromomethane	75274	Calif. Toxics Rule	0.56	0.5	EPA 8260B
36	Dichloromethane	75092	Calif. Toxics Rule	4.7	0.5	EPA 8260B
33	Ethylbenzene	100414	Taste & Odor	29	0.5	EPA 8260B
88	Hexachlorobenzene	118741	Calif. Toxics Rule	0.00075	1	EPA 8260B
89	Hexachlorobutadiene	87683	National Toxics Rule	0.44	1	EPA 8260B
91	Hexachloroethane	67721	National Toxics Rule	1.9	1	EPA 8260B
94	Naphthalene	91203	USEPA IRIS	14	10	EPA 8260B
38	Tetrachloroethene	127184	National Toxics Rule	0.8	0.5	EPA 8260B
39	Toluene	108883	Taste & Odor	42	0.5	EPA 8260B
40	trans-1,2-Dichloroethylene	156605	Primary MCL	10	0.5	EPA 8260B
43	Trichloroethene	79016	National Toxics Rule	2.7	0.5	EPA 8260B
44	Vinyl chloride	75014	Primary MCL	0.5	0.5	EPA 8260B
	Methyl-tert-butyl ether (MTBE)	1634044	Secondary MCL	5	0.5	EPA 8260B
	Trichlorofluoromethane	75694	Primary MCL	150	5	EPA 8260B
	1,1,2-Trichloro-1,2,2-Trifluoroethane	76131	Primary MCL	1200	10	EPA 8260B
	Styrene	100425	Taste & Odor	11	0.5	EPA 8260B
	Xylenes	1330207	Taste & Odor	17	0.5	EPA 8260B
SEMI-VOLATILE ORGANICS						
60	1,2-Benzanthracene	56553	Calif. Toxics Rule	0.0044	5	EPA 8270C
85	1,2-Diphenylhydrazine	122667	National Toxics Rule	0.04	1	EPA 8270C
45	2-Chlorophenol	95578	Taste and Odor	0.1	2	EPA 8270C
46	2,4-Dichlorophenol	120832	Taste and Odor	0.3	1	EPA 8270C
47	2,4-Dimethylphenol	105679	Calif. Toxics Rule	540	2	EPA 8270C
49	2,4-Dinitrophenol	51285	National Toxics Rule	70	5	EPA 8270C
82	2,4-Dinitrotoluene	121142	National Toxics Rule	0.11	5	EPA 8270C
55	2,4,6-Trichlorophenol	88062	Taste and Odor	2	10	EPA 8270C
83	2,6-Dinitrotoluene	606202	USEPA IRIS	0.05	5	EPA 8270C
50	2-Nitrophenol	25154557	Aquatic Toxicity	150 (5)	10	EPA 8270C
71	2-Chloronaphthalene	91587	Aquatic Toxicity	1600 (6)	10	EPA 8270C
78	3,3'-Dichlorobenzidine	91941	National Toxics Rule	0.04	5	EPA 8270C
62	3,4-Benzofluoranthene	205992	Calif. Toxics Rule	0.0044	10	EPA 8270C
52	4-Chloro-3-methylphenol	59507	Aquatic Toxicity	30	5	EPA 8270C
48	4,6-Dinitro-2-methylphenol	534521	National Toxics Rule	13.4	10	EPA 8270C
51	4-Nitrophenol	100027	USEPA Health Advisory	60	5	EPA 8270C
69	4-Bromophenyl phenyl ether	101553	Aquatic Toxicity	122	10	EPA 8270C

CTR #	Constituent	CAS Number	Controlling Water Quality Criterion for Surface Waters		Criterion Quantitation Limit ug/L or noted	Suggested Test Methods
			Basis	Criterion Concentration ug/L or noted[1]		
72	4-Chlorophenyl phenyl ether	7005723	Aquatic Toxicity	122 (3)	5	EPA 8270C
56	Acenaphthene	83329	Taste and Odor	20	1	EPA 8270C
57	Acenaphthylene	208968	No Criteria Available		10	EPA 8270C
58	Anthracene	120127	Calif. Toxics Rule	9,600	10	EPA 8270C
59	Benzidine	92875	National Toxics Rule	0.00012	5	EPA 8270C
61	Benzo(a)pyrene (3,4-Benzopyrene)	50328	Calif. Toxics Rule	0.0044	0.1	EPA 8270C
63	Benzo(g,h,i)perylene	191242	No Criteria Available		5	EPA 8270C
64	Benzo(k)fluoranthene	207089	Calif. Toxics Rule	0.0044	2	EPA 8270C
65	Bis(2-chloroethoxy) methane	111911	No Criteria Available		5	EPA 8270C
66	Bis(2-chloroethyl) ether	111444	National Toxics Rule	0.031	1	EPA 8270C
67	Bis(2-chloroisopropyl) ether	39638329	Aquatic Toxicity	122 (3)	10	EPA 8270C
68	Bis(2-ethylhexyl) phthalate	117817	National Toxics Rule	1.8	3	EPA 8270C
70	Butyl benzyl phthalate	85687	Aquatic Toxicity	3 (7)	10	EPA 8270C
73	Chrysene	218019	Calif. Toxics Rule	0.0044	5	EPA 8270C
81	Di-n-butylphthalate	84742	Aquatic Toxicity	3 (7)	10	EPA 8270C
84	Di-n-octylphthalate	117840	Aquatic Toxicity	3 (7)	10	EPA 8270C
74	Dibenzo(a,h)-anthracene	53703	Calif. Toxics Rule	0.0044	0.1	EPA 8270C
79	Diethyl phthalate	84662	Aquatic Toxicity	3 (7)	2	EPA 8270C
80	Dimethyl phthalate	131113	Aquatic Toxicity	3 (7)	2	EPA 8270C
86	Fluoranthene	206440	Calif. Toxics Rule	300	10	EPA 8270C
87	Fluorene	86737	Calif. Toxics Rule	1300	10	EPA 8270C
90	Hexachlorocyclopentadiene	77474	Taste and Odor	1	1	EPA 8270C
92	Indeno(1,2,3-c,d)pyrene	193395	Calif. Toxics Rule	0.0044	0.05	EPA 8270C
93	Isophorone	78591	National Toxics Rule	8.4	1	EPA 8270C
98	N-Nitrosodiphenylamine	86306	National Toxics Rule	5	1	EPA 8270C
96	N-Nitrosodimethylamine	62759	National Toxics Rule	0.00069	5	EPA 8270C
97	N-Nitrosodi-n-propylamine	621647	Calif. Toxics Rule	0.005	5	EPA 8270C
95	Nitrobenzene	98953	National Toxics Rule	17	10	EPA 8270C
53	Pentachlorophenol	87865	Calif. Toxics Rule	0.28	0.2	EPA 8270C
99	Phenanthrene	85018	No Criteria Available		5	EPA 8270C
54	Phenol	108952	Taste and Odor	5	1	EPA 8270C
100	Pyrene	129000	Calif. Toxics Rule	960	10	EPA 8270C
INORGANICS						
	Aluminum	7429905	Ambient Water Quality	87	50	EPA 6020/200.8
1	Antimony	7440360	Primary MCL	6	5	EPA 6020/200.8
2	Arsenic	7440382	Ambient Water Quality	0.018	0.01	EPA 1632

CTR #	Constituent	CAS Number	Controlling Water Quality Criterion for Surface Waters		Criterion Quantitation Limit ug/L or noted	Suggested Test Methods
			Basis	Criterion Concentration ug/L or noted[1]		
15	Asbestos	1332214	National Toxics Rule/ Primary MCL	7 MFL	0.2 MFL >10um	EPA/600/R-93/116(PCM)
	Barium	7440393	Basin Plan Objective	100	100	EPA 6020/200.8
3	Beryllium	7440417	Primary MCL	4	1	EPA 6020/200.8
4	Cadmium	7440439	Public Health Goal	0.07	0.25	EPA 1638/200.8
5a	Chromium (total)	7440473	Primary MCL	50	2	EPA 6020/200.8
5b	Chromium (VI)	18540299	Public Health Goal	0.2	0.5	EPA 7199/1636
6	Copper	7440508	National Toxics Rule	4.1 (2)	0.5	EPA 6020/200.8
14	Cyanide	57125	National Toxics Rule	5.2	5	EPA 9012A
	Fluoride	7782414	Public Health Goal	1000	0.1	EPA 300
	Iron	7439896	Secondary MCL	300	100	EPA 6020/200.8
7	Lead	7439921	Calif. Toxics Rule	0.92 (2)	0.5	EPA 1638
8	Mercury	7439976	TMDL Development		0.0002 (11)	EPA 1669/1631
	Manganese	7439965	Secondary MCL/ Basin Plan Objective	50	20	EPA 6020/200.8
9	Nickel	7440020	Calif. Toxics Rule	24 (2)	5	EPA 6020/200.8
10	Selenium	7782492	Calif. Toxics Rule	5 (8)	5	EPA 6020/200.8
11	Silver	7440224	Calif. Toxics Rule	0.71 (2)	1	EPA 6020/200.8
12	Thallium	7440280	National Toxics Rule	1.7	1	EPA 6020/200.8
	Tributyltin	688733	Ambient Water Quality	0.063	0.002	EV-024/025
13	Zinc	7440666	Calif. Toxics Rule/ Basin Plan Objective	54/ 16 (2)	10	EPA 6020/200.8
PESTICIDES - PCBs						
110	4,4'-DDD	72548	Calif. Toxics Rule	0.00083	0.02	EPA 8081A
109	4,4'-DDE	72559	Calif. Toxics Rule	0.00059	0.01	EPA 8081A
108	4,4'-DDT	50293	Calif. Toxics Rule	0.00059	0.01	EPA 8081A
112	alpha-Endosulfan	959988	National Toxics Rule	0.056 (9)	0.02	EPA 8081A
103	alpha-Hexachlorocyclohexane (BHC)	319846	Calif. Toxics Rule	0.0039	0.01	EPA 8081A
	Alachlor	15972608	Primary MCL	2	1	EPA 8081A
102	Aldrin	309002	Calif. Toxics Rule	0.00013	0.005	EPA 8081A
113	beta-Endosulfan	33213659	Calif. Toxics Rule	0.056 (9)	0.01	EPA 8081A
104	beta-Hexachlorocyclohexane	319857	Calif. Toxics Rule	0.014	0.005	EPA 8081A
107	Chlordane	57749	Calif. Toxics Rule	0.00057	0.1	EPA 8081A
106	delta-Hexachlorocyclohexane	319868	No Criteria Available		0.005	EPA 8081A
111	Dieldrin	60571	Calif. Toxics Rule	0.00014	0.01	EPA 8081A
114	Endosulfan sulfate	1031078	Ambient Water Quality	0.056	0.05	EPA 8081A
115	Endrin	72208	Calif. Toxics Rule	0.036	0.01	EPA 8081A
116	Endrin Aldehyde	7421934	Calif. Toxics Rule	0.76	0.01	EPA 8081A

CTR #	Constituent	CAS Number	Controlling Water Quality Criterion for Surface Waters		Criterion Quantitation Limit ug/L or noted	Suggested Test Methods
			Basis	Criterion Concentration ug/L or noted[1]		
117	Heptachlor	76448	Calif. Toxics Rule	0.00021	0.01	EPA 8081A
118	Heptachlor Epoxide	1024573	Calif. Toxics Rule	0.0001	0.01	EPA 8081A
105	Lindane (gamma-Hexachlorocyclohexane)	58899	Calif. Toxics Rule	0.019	0.019	EPA 8081A
119	PCB-1016	12674112	Calif. Toxics Rule	0.00017 (10)	0.5	EPA 8082
120	PCB-1221	11104282	Calif. Toxics Rule	0.00017 (10)	0.5	EPA 8082
121	PCB-1232	11141165	Calif. Toxics Rule	0.00017 (10)	0.5	EPA 8082
122	PCB-1242	53469219	Calif. Toxics Rule	0.00017 (10)	0.5	EPA 8082
123	PCB-1248	12672296	Calif. Toxics Rule	0.00017 (10)	0.5	EPA 8082
124	PCB-1254	11097691	Calif. Toxics Rule	0.00017 (10)	0.5	EPA 8082
125	PCB-1260	11096825	Calif. Toxics Rule	0.00017 (10)	0.5	EPA 8082
126	Toxaphene	8001352	Calif. Toxics Rule	0.0002	0.5	EPA 8081A
	Atrazine	1912249	Public Health Goal	0.15	1	EPA 8141A
	Bentazon	25057890	Primary MCL	18	2	EPA 643/ 515.2
	Carbofuran	1563662	CDFG Hazard Assess.	0.5	5	EPA 8318
	2,4-D	94757	Primary MCL	70	10	EPA 8151A
	Dalapon	75990	Ambient Water Quality	110	10	EPA 8151A
	1,2-Dibromo-3-chloropropane (DBCP)	96128	Public Health Goal	0.0017	0.01	EPA 8260B
	Di(2-ethylhexyl)adipate	103231	USEPA IRIS	30	5	EPA 8270C
	Dinoseb	88857	Primary MCL	7	2	EPA 8151A
	Diquat	85007	Ambient Water Quality	0.5	4	EPA 8340/ 549.1/HPLC
	Endothal	145733	Primary MCL	100	45	EPA 548.1
	Ethylene Dibromide	106934	OEHHA Cancer Risk	0.0097	0.02	EPA 8260B/504
	Glyphosate	1071836	Primary MCL	700	25	HPLC/EPA 547
	Methoxychlor	72435	Public Health Goal	30	10	EPA 8081A
	Molinate (Ordram)	2212671	CDFG Hazard Assess.	13	2	EPA 634
	Oxamyl	23135220	Public Health Goal	50	20	EPA 8318/632
	Picloram	1918021	Primary MCL	500	1	EPA 8151A
	Simazine (Princep)	122349	USEPA IRIS	3.4	1	EPA 8141A
	Thiobencarb	28249776	Basin Plan Objective/ Secondary MCL	1	1	HPLC/EPA 639
16	2,3,7,8-TCDD (Dioxin)	1746016	Calif. Toxics Rule	1.30E-08	5.00E-06	EPA 8290 (HRGC) MS
	2,4,5-TP (Silvex)	93765	Ambient Water Quality	10	1	EPA 8151A
	Diazinon	333415	CDFG Hazard Assess.	0.05	0.25	EPA 8141A/GCMS
	Chlorpyrifos	2921882	CDFG Hazard Assess.	0.014	1	EPA 8141A/GCMS
OTHER CONSTITUENTS						
	Ammonia (as N)	7664417	Ambient Water Quality	1500 (4)		EPA 350.1

CTR #	Constituent	CAS Number	Controlling Water Quality Criterion for Surface Waters		Criterion Quantitation Limit ug/L or noted	Suggested Test Methods
			Basis	Criterion Concentration ug/L or noted[1]		
	Chloride	16887006	Agricultural Use	106,000		EPA 300.0
	Flow			1 CFS		
	Hardness (as $CaCO_3$)			5000		EPA 130.2
	Foaming Agents (MBAS)		Secondary MCL	500		SM5540C
	Nitrate (as N)	14797558	Primary MCL	10,000	2,000	EPA 300.0
	Nitrite (as N)	14797650	Primary MCL	1000	400	EPA 300.0
	pH		Basin Plan Objective	6.5-8.5	0.1	EPA 150.1
	Phosphorus, Total (as P)	7723140	USEPA IRIS	0.14		EPA 365.3
	Specific conductance (EC)		Agricultural Use	700 umhos/cm		EPA 120.1
	Sulfate		Secondary MCL	250,000	500	EPA 300.0
	Sulfide (as S)		Taste and Odor	0.029		EPA 376.2
	Sulfite (as SO_3)		No Criteria Available			SM4500-SO3
	Temperature		Basin Plan Objective	^{o}F		
	Total Disolved Solids (TDS)		Agricultural Use	450,000		EPA 160.1

FOOTNOTES:

(1) - The Criterion Concentrations serve only as a point of reference for the selection of the appropriate analytical method. They do not indicate a regulatory decision that the cited concentration is either necessary or sufficient for full protection of beneficial uses. Available technology may require that effluent limits be set lower than these values.

(2) - Freshwater aquatic life criteria for metals are expressed as a function of total hardness (mg/L) in the water body. Values displayed correspond to a total hardness of 40 mg/L.

(3) - For haloethers

(4) - Freshwater aquatic life criteria for ammonia are expressed as a function of pH and temperature of the water body. Values displayed correspond to pH 8.0 and temperature of 22℃.

(5) - For nitrophenols.

(6) - For chlorinated naphthalenes.

(7) - For phthalate esters.

(8) - Basin Plan objective = 2 ug/L for Salt Slough and specific constructed channels in the Grassland watershed.

(9) - Criteria for sum of alpha- and beta- forms.

(10) - Criteria for sum of all PCBs.

(11) - Mercury monitoring shall utilize "ultra-clean" sampling and analytical methods. These methods include:

Method 1669: Sampling Ambient Water for Trace Metals at USEPA Water Quality Criteria Levels, USEPA; and

Method 1631: Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluoresence, USEPA

III. Additional Study Requirements

A. Laboratory Requirements. The laboratory analyzing the monitoring samples shall be certified by the Department of Health Services in accordance with the provisions of Water Code 13176 and must include quality assurance/quality control data with their reports (ELAP certified).

B. Criterion Quantitation Limit (CQL). The criterion quantitation limits will be equal to or lower than the minimum levels (MLs) in Appendix 4 of the SIP or the detection limits for purposes of reporting (DLRs) below the controlling water quality criterion concentrations summarized in Table I-1 of this Order. In cases where the controlling water quality criteria concentrations are below the detection limits of all approved analytical methods, the best available procedure will be utilized that meets the lowest of the MLs and DLR. Table I-1 contains suggested analytical procedures. The Discharger is not required to use these specific procedures as long as the procedure selected achieves the desired minimum detection level.

C. Method Detection Limit (MDL). The method detection limit for the laboratory shall be determined by the procedure found in 40 CFR Part 136, Appendix B (revised as of May 14, 1999).

D. Reporting Limit (RL). The reporting limit for the laboratory. This is the lowest quantifiable concentration that the laboratory can determine. Ideally, the RL should be equal to or lower than the CQL to meet the purposes of this monitoring.

E. Reporting Protocols. The results of analytical determinations for the presence of chemical constituents in a sample shall use the following reporting protocols:

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

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

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

4. Sample results that are less than the laboratory's MDL shall be reported as "Not Detected" or ND.

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

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

ATTACHMENT I – DIOXIN AND FURAN SAMPLING

The CTR includes criteria for 2,3,7,8-tetrachlorodibenzo-pdioxin (2,3,7,8-TCDD). In addition to this compound, there are many congeners of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) that exhibit toxic effects similar to those of 2,3,7,8-TCDD. The USEPA has published toxic equivalency factors (TEFs) for 17 of the congeners. The TEFs express the relative toxicities of the congeners compared to 2,3,7,8-TCDD (whose TEF equals 1.0). In June 1997, participants in a World Health Organization (WHO) expert meeting revised TEF values for 1,2,3,7,8-PentaCDD, OctaCDD, and OctaCDF. The current TEFs for the 17 congeners, which include the three revised values, are shown below:

Toxic Equivalency Factors (TEFs) for 2,3,7,8-TCDD Equivalents

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

The Discharger shall conduct effluent and receiving water monitoring for the 2,3,7,8-TCDD congeners listed above to assess the presence and amounts of the congeners being discharged and already present in the receiving water. Effluent and upstream receiving water shall be monitored for the presence of the 17 congeners once during dry weather and once during wet weather for 1 year within the term of the study.

The Discharger shall report, for each congener, the analytical results of the effluent and receiving water monitoring, including the quantifiable limit and the method detection limit, and the measured or estimated concentration.

In addition, the Discharger shall multiply each measured or estimated congener concentration by its respective TEF value and report the sum of these values.

ATTACHMENT J – SACRAMENTO RIVER BACKGROUND RECEIVING WATER HARDNESS & FLOW DATA

Sacramento River Flows 10,000 cfs and Under

Date	Hardness as $CaCO_3$ (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Difference	River Flow (cfs)	Water Year Classification
4/30/2001 11:45	61	72	18%	9599	D
5/7/2001 9:10	65	71	9%	7350	D
5/14/2001 9:00	63	71	13%	8236	D
5/16/01	64	-	-	8354	D
10/15/2001 13:45	55	62	13%	7115	D
10/17/01	56	-	-	7389	D
10/22/2001 12:20	59	69	17%	7698	D
10/29/2001 13:05	55	63	15%	8122	D
11/7/2001 11:05	69	78	13%	9486	D
5/6/2002 9:40	52	59	13%	9641	D
5/1/2007 9:40	55	59	7%	9597	D
6/4/2007 12:06	61	67	10%	9787	D
6/5/07	64	-	-	9397	D
11/5/2007 10:20	55	64	16%	8761	D
4/2/08	76	-	-	9532	C
4/7/2008 9:45	70	74	6%	9028	C
5/21/2008 9:42	59	66	12%	9517	C
10/1/2008 11:20	36	61	69%	8389	C
10/7/08	50	-	-	8863	C
10/22/2008 11:20	54	60	11%	7770	C
11/20/2008 11:45	70	78	11%	8904	C
12/1/2008 10:30	77	83	8%	7800	C
12/17/2008 10:15	80	88	10%	8273	C
1/5/2009 11:15	75	80	7%	8237	D
1/22/2009 12:55	76	83	9%	8329	D
2/2/2009 11:50	84	86	2%	9282	D
6/16/2009 9:05	55	58	5%	9701	D
9/22/2009 9:14	69	69	0%	9711	D
10/5/2009 10:10	53	53	0%	9555	D
10/21/2009 8:55	54	55	2%	9867	D
11/2/2009 12:00	57	60	5%	8714	D
11/17/2009 10:00	67	71	6%	8110	D
12/1/2009 11:35	71	78	10%	8557	D
count	**32**	**27**	**27**	**32**	-
min	**36**	**53**	**0%**	**7115**	-
max	**84**	**88**	**69%**	**9867**	-
average	**63**	**69**	**11%**	**8747**	-

Sacramento River Flows > 10,000 cfs

Date	Hardness as $CaCO_3$ (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Difference	River Flow (cfs)	Water Year Classification
8/11/1997	52	58	12%	18883	W
8/20/1997	54	61	13%	16695	W
8/26/1997	62	70	13%	19798	W
9/11/1997	68	75	10%	15819	W
9/18/1997	62	71	15%	13341	W
9/25/1997	54	60	11%	11045	W
10/14/1997	48	51	6%	12568	W
1/22/1998	44	-	-	73577	W
2/18/1998	58	-	-	82943	W
3/16/1998	61	-	-	51179	W
4/22/1998	78	-	-	44133	W
5/21/1998	44	-	-	47774	W
6/10/1998 8:05	48	50	4%	60433	W
6/23/98	44	-	-	47790	W
7/7/1998 8:23	40	42	5%	31420	W
7/22/98	44	-	-	19375	W
8/4/1998 8:55	46	54	17%	24339	W
8/19/98	52	-	-	24941	W
9/1/1998 9:05	52	54	4%	26030	W
9/8/1998 8:40	52	56	8%	28405	W
9/15/98	70	-	-	23500	W
9/15/1998 10:45	59	62	5%	23500	W
9/22/1998 11:10	52	58	12%	23112	W
9/29/1998 10:25	46	50	9%	22937	W
10/6/1998 10:30	46	54	17%	19109	W
10/13/1998 8:25	52	53	2%	14926	W
10/20/1998 11:10	52	58	12%	13247	W
10/21/98	30	-	-	13080	W
10/27/1998 10:05	52	57	10%	14287	W
11/9/1998 12:35	59	62	5%	15195	W
11/17/1998 11:05	55	67	22%	18679	W
12/1/1998 8:50	46	47	2%	37267	W
12/8/1998 12:20	35	50	43%	62296	W
12/14/1998 12:50	36	52	44%	54218	W
12/17/98	48	-	-	49264	W
12/21/1998 12:04	48	55	15%	38482	W
12/28/1998 11:00	55	62	13%	24868	W
1/4/1999 9:25	60	59	2%	20694	W
1/11/1999 11:20	59	64	8%	17975	W
1/19/1999 10:40	55	61	11%	23769	W
1/21/99	40	-	-	56755	W
1/25/1999 12:55	37	40	8%	67454	W
2/2/1999 9:21	48	54	13%	41607	W
2/8/1999 12:15	39	45	15%	60247	W
2/16/1999 11:50	39	45	15%	71225	W

Date	Hardness as $CaCO_3$ (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Difference	River Flow (cfs)	Water Year Classification
2/18/99	37	-	-	86652	W
2/22/1999 12:00	36	39	8%	79336	W
3/2/1999 9:40	46	49	7%	73368	W
3/8/1999 12:00	39	48	23%	71324	W
3/15/1999 12:25	45	54	20%	63946	W
3/17/99	52	-	-	57248	W
3/22/1999 12:20	52	61	17%	40847	W
3/29/1999 12:15	55	59	7%	43134	W
4/7/1999 8:39	55	60	9%	27268	W
4/12/1999 11:35	55	60	9%	30780	W
4/26/1999 12:00	48	54	13%	27585	W
5/4/1999 8:45	46	54	17%	24796	W
5/10/1999 11:15	52	55	6%	21176	W
5/17/1999 10:15	46	55	20%	16987	W
5/19/99	53	-	-	16642	W
5/24/1999 12:35	55	63	15%	18341	W
6/1/1999 8:40	52	58	12%	19846	W
6/7/1999 12:20	52	61	17%	21337	W
6/14/1999 10:40	48	55	15%	15691	W
6/21/1999 10:30	52	57	10%	14811	W
6/23/99	47	-	-	14576	W
6/28/1999 11:15	43	53	23%	17154	W
7/7/1999 8:25	46	54	17%	20575	W
7/12/1999 13:40	46	51	11%	21421	W
7/19/1999 14:10	43	42	2%	22963	W
7/20/99	46	-	-	23607	W
7/26/1999 12:50	46	45	2%	23463	W
8/4/1999 8:30	49	55	12%	22219	W
8/9/1999 13:00	52	65	25%	18917	W
8/16/1999 12:05	58	68	17%	16870	W
8/18/99	46	-	-	15435	W
8/23/1999 11:40	60	73	22%	15608	W
8/31/1999 11:40	60	81	35%	17803	W
9/7/1999 9:00	61	80	31%	16427	W
9/13/1999 12:15	70	87	24%	16204	W
9/20/1999 11:45	65	80	23%	16557	W
9/22/99	60	-	-	15410	W
9/27/1999 12:15	59	79	34%	14471	W
10/6/1999 8:35	46	60	30%	13864	W
10/12/1999 13:10	46	57	24%	13916	W
10/19/99	81	-	-	10689	W
10/19/1999 11:30	46	54	17%	10689	W
10/25/1999 12:25	52	56	8%	10831	W
11/2/1999 10:00	52	59	13%	11628	W
11/8/1999 12:40	52	69	33%	12357	W
11/15/1999 12:15	60	74	23%	14460	W
11/17/99	68	-	-	14400	W

Date	Hardness as $CaCO_3$ (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Difference	River Flow (cfs)	Water Year Classification
11/22/1999 11:05	68	72	6%	16447	W
11/29/1999 12:05	61	69	13%	14452	W
12/6/1999 10:50	59	65	10%	17676	W
12/13/1999 12:15	56	64	14%	17786	W
12/14/99	58	-	-	17780	W
12/20/1999 13:00	55	65	18%	15953	W
12/27/1999 11:20	55	65	18%	15415	W
1/3/2000 9:55	59	67	14%	14687	AN
1/10/2000 13:15	59	66	12%	13760	AN
1/18/2000 9:45	61	70	15%	24004	AN
1/24/2000 8:40	46	48	4%	29970	AN
1/31/2000 12:20	59	57	3%	43778	AN
2/7/2000 10:30	52	57	10%	38759	AN
2/14/2000 9:45	42	44	5%	75712	AN
2/16/00	110	-	-	87518	AN
2/22/2000 12:55	46	50	9%	72319	AN
2/28/2000 9:35	40	42	5%	81724	AN
3/6/2000 10:00	43	47	9%	74492	AN
3/13/2000 9:40	46	48	4%	71614	AN
3/20/2000 10:30	55	58	5%	53767	AN
3/23/00	70	-	-	42599	AN
3/27/2000 12:30	61	66	8%	32855	AN
4/3/2000 8:45	55	63	15%	24298	AN
4/10/2000 9:15	52	56	8%	22879	AN
4/17/2000 8:45	48	54	13%	29924	AN
4/19/00	46	-	-	32045	AN
4/24/2000 8:35	51	53	4%	28856	AN
5/1/2000 8:30	46	49	7%	25192	AN
5/8/2000 9:36	43	49	14%	27455	AN
5/15/2000 10:50	52	57	10%	15280	AN
5/17/00	64	-	-	18252	AN
5/22/2000 9:20	61	63	3%	16917	AN
5/30/2000 13:30	61	65	7%	16158	AN
6/5/2000 8:50	50	56	12%	15146	AN
6/12/2000 8:50	61	67	10%	16972	AN
6/19/2000 10:00	43	50	16%	15304	AN
6/21/00	64	-	-	13727	AN
6/26/2000 9:10	46	55	20%	17671	AN
7/3/2000 9:00	46	53	15%	20055	AN
7/10/2000 9:55	52	58	12%	20826	AN
7/17/2000 10:10	49	54	10%	20571	AN
7/19/00	46	-	-	20651	AN
7/24/2000 8:40	49	54	10%	22051	AN
8/1/2000 8:50	50	56	12%	21077	AN
8/7/2000 13:25	52	53	2%	18859	AN
8/14/2000 10:17	57	64	12%	16916	AN
8/16/00	64	-	-	16920	AN

Date	Hardness as $CaCO_3$ (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Difference	River Flow (cfs)	Water Year Classification
8/21/2000 9:50	61	66	8%	15805	AN
8/28/2000 10:05	59	69	17%	16545	AN
9/5/2000 9:10	68	78	15%	18162	AN
9/11/2000 10:00	69	77	12%	15310	AN
9/18/2000 10:55	63	71	13%	14454	AN
9/20/2000 0:00	66	-	-	13126	AN
9/25/2000 14:20	56	59	5%	14044	AN
10/2/2000 10:00	56	60	7%	12043	AN
10/10/2000 9:30	52	57	10%	11067	AN
10/16/2000 10:30	56	54	4%	11906	AN
10/18/00	52	-	-	12062	AN
10/23/2000 9:53	57	60	5%	10586	AN
10/30/2000 12:40	59	62	5%	13999	AN
11/6/2000 11:40	64	66	3%	11962	AN
11/8/00	62	-	-	11216	AN
11/13/2000 11:05	62	64	3%	11086	AN
11/20/2000 12:40	59	65	10%	12409	AN
11/27/2000 13:35	63	69	10%	13080	AN
12/4/2000 10:15	65	69	6%	14066	AN
12/11/2000 13:20	68	71	4%	13162	AN
12/18/2000 10:25	68	74	9%	15564	AN
12/20/00	62	-	-	13926	AN
12/26/2000 12:15	68	71	4%	13503	AN
1/2/2001 13:45	67	71	6%	13022	D
1/8/2001 14:15	68	72	6%	12766	D
1/16/2001 13:30	65	67	3%	19212	D
1/22/2001 13:50	71	78	10%	13271	D
1/29/2001 9:10	50	50	0%	26332	D
2/5/2001 11:00	81	82	1%	13324	D
2/13/2001 12:55	76	75	1%	23528	D
2/20/2001 13:20	78	78	0%	17216	D
2/21/01	76	-	-	21480	D
2/26/2001 13:20	54	50	7%	34529	D
3/5/2001 10:50	81	77	5%	27360	D
3/12/2001 13:40	73	71	3%	31416	D
3/19/2001 13:20	81	82	1%	18020	D
3/21/01	74	-	-	17036	D
3/26/2001 12:55	70	73	4%	16008	D
4/2/2001 10:40	73	74	1%	13997	D
4/9/2001 12:20	64	68	6%	13871	D
4/16/2001 12:03	68	72	6%	11538	D
4/18/01	66	-	-	10195	D
4/23/2001 11:20	66	77	17%	12772	D
5/21/2001 8:20	58	66	14%	10639	D
5/29/2001 9:45	59	68	15%	11449	D
6/4/2001 9:45	52	61	17%	12481	D
6/11/2001 9:20	52	59	13%	11474	D

Date	Hardness as $CaCO_3$ (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Difference	River Flow (cfs)	Water Year Classification
6/18/2001 8:30	51	64	25%	11895	D
6/19/01	54	-	-	11760	D
6/25/2001 9:12	49	58	18%	12423	D
7/2/2001 9:15	56	66	18%	14872	D
7/11/2001 9:10	50	58	16%	14547	D
7/16/2001 10:20	50	57	14%	14354	D
7/23/2001 9:20	52	60	15%	15312	D
7/31/2001 11:05	55	63	15%	15984	D
8/6/2001 9:32	59	69	17%	13608	D
8/13/2001 13:20	60	70	17%	13676	D
8/15/01	52	-	-	13200	D
8/20/2001 12:30	65	74	14%	12809	D
8/27/2001 10:50	71	82	15%	12043	D
9/4/2001 9:40	72	86	19%	12298	D
9/10/2001 12:30	65	83	28%	12915	D
9/17/2001 9:50	65	82	26%	12505	D
9/19/01	58	-	-	12223	D
9/25/2001 10:55	55	68	24%	12354	D
10/1/2001 13:20	52	67	29%	11100	D
11/14/01	68	-	-	12868	D
12/3/2001 10:05	64	62	3%	28968	D
12/19/01	68	-	-	24130	D
1/7/2002 11:10	50	52	4%	64512	D
1/16/02	60	-	-	33804	D
2/4/2002 10:50	75	85	13%	17567	D
2/6/02	78	-	-	16611	D
3/4/2002 10:05	61	67	10%	18236	D
3/6/02	64	-	-	17902	D
4/2/2002 10:25	55	61	11%	16487	D
4/3/02	58	-	-	16537	D
5/8/02	54	-	-	10061	D
6/3/2002 10:55	52	63	21%	12558	D
6/5/02	52	-	-	12740	D
7/1/2002 9:45	43	56	30%	17049	D
7/10/02	46	-	-	17991	D
8/6/2002 11:05	59	66	12%	18720	D
8/7/02	54	-	-	18740	D
9/3/2002 10:15	65	78	20%	13249	D
9/4/02	66	-	-	13370	D
10/2/02	62	-	-	11737	D
10/7/2002 10:30	52	63	21%	10104	D
11/4/2002 10:45	59	71	20%	10392	D
11/6/02	62	-	-	11271	D
12/2/2002 10:30	68	82	21%	10230	D
12/4/02	68	-	-	10549	D
1/6/2003 11:40	55	57	4%	56993	AN
1/8/03	56	-	-	44135	AN

Date	Hardness as $CaCO_3$ (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Difference	River Flow (cfs)	Water Year Classification
2/3/2003 13:15	55	62	13%	40244	AN
2/5/03	58	-	-	35387	AN
3/3/2003 9:42	68	71	4%	23213	AN
3/5/03	62	-	-	20770	AN
4/1/2003 9:40	59	65	10%	18524	AN
4/2/03	60	-	-	18037	AN
5/5/2003 9:30	46	51	11%	56851	AN
5/7/03	48	-	-	61762	AN
6/2/2003 10:10	46	52	13%	28061	AN
7/7/2003 10:40	46	55	20%	19538	AN
8/4/2003 10:00	43	53	23%	25251	AN
8/6/03	44	-	-	25216	AN
9/2/2003 9:20	59	74	25%	16232	AN
10/6/2003 9:15	52	59	13%	11530	AN
10/15/03	50	-	-	10595	AN
11/3/2003 12:35	50	60	20%	11947	AN
12/1/2003 10:00	63	67	6%	12350	AN
12/11/03	56	-	-	21519	AN
1/7/2004 14:55	55	55	0%	48126	BN
2/2/2004 9:55	68	73	7%	22870	BN
2/18/04	68	-	-	39074	BN
3/1/2004 10:15	46	51	11%	71294	BN
4/5/2004 9:00	55	58	5%	23602	BN
5/3/2004 9:00	55	58	5%	11655	BN
6/7/2004 9:50	55	60	9%	12781	BN
6/9/04	78	-	-	16268	BN
7/6/2004 10:05	46	54	17%	19559	BN
8/3/2004 11:50	52	60	15%	19407	BN
8/11/04	64	-	-	18261	BN
9/13/2004 10:50	59	72	22%	15358	BN
10/4/2004 10:25	52	63	21%	10500	BN
10/6/04	54	-	-	10600	BN
11/1/2004 11:00	59	70	19%	13135	BN
12/6/2004 10:50	75	86	15%	10056	BN
12/8/04	74	-	-	12547	BN
1/3/2005 11:30	55	58	5%	53817	AN
2/7/2005 11:00	92	91	1%	21419	AN
2/16/05	80	-	-	18689	AN
2/16/2005 11:30	84	86	2%	18689	AN
3/8/2005 10:22	80	87	9%	24324	AN
3/16/2005 11:15	77	74	4%	18923	AN
4/4/2005 13:20	64	65	2%	26078	AN
4/13/05	57	-	-	23354	AN
4/28/2005 11:30	61	64	5%	15705	AN
5/2/2005 10:25	57	59	4%	14202	AN
5/18/2005 10:15	46	47	2%	43300	AN
6/6/2005 13:30	46	52	13%	29700	AN

Date	Hardness as $CaCO_3$ (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Difference	River Flow (cfs)	Water Year Classification
6/8/05	46	-	-	27500	AN
6/16/2005 12:10	46	51	11%	28400	AN
7/5/2005 9:45	55	59	7%	19000	AN
9/6/2005 10:45	61	71	16%	18302	AN
10/3/2005 10:15	52	56	8%	19704	AN
10/5/05	52	-	-	19336	AN
11/7/2005 11:30	59	68	15%	12321	AN
11/22/2005 9:50	59	69	17%	13054	AN
12/1/05	70	-	-	16158	AN
12/5/2005 11:10	46	52	13%	26208	AN
12/20/2005 9:55	61	67	10%	23928	AN
1/3/2006 13:20	30	29	3%	86861	W
1/17/2006 16:15	41	46	12%	68250	W
2/6/06	58	-	-	37337	C
2/6/2006 11:45	46	44	4%	71158	W
2/8/06	64	-	-	71685	W
2/23/2006 11:00	55	58	5%	29773	W
3/6/2006 10:40	36	38	6%	69890	W
3/23/2006 11:30	48	50	4%	65878	W
4/5/06	74	-	-	92662	W
4/6/2006 9:15	30	32	7%	92156	W
4/20/2006 11:10	39	41	5%	75352	W
5/1/2006 11:45	39	41	5%	71433	W
5/22/2006 11:25	39	40	3%	48831	W
6/5/2006 11:09	46	51	11%	31859	W
7/3/2006 10:50	52	55	6%	21594	W
8/3/06	56	-	-	21794	W
8/24/2006 12:53	55	61	11%	20298	W
9/5/2006 10:40	59	60	2%	18635	W
10/19/2006 9:25	55	58	5%	10965	W
11/6/2006 10:20	59	62	5%	10863	W
11/21/2006 9:45	64	69	8%	12143	W
12/4/2006 13:55	61	66	8%	11644	W
12/9/06	62	-	-	12861	W
12/21/2006 14:50	70	68	3%	16619	W
1/2/2007 11:25	68	66	3%	18167	D
2/5/2007 10:05	77	71	8%	12886	D
2/8/07	70	-	-	14086	D
2/21/2007 11:20	68	67	1%	20608	D
3/6/2007 13:00	55	53	4%	26902	D
3/21/2007 9:20	61	63	3%	15069	D
4/3/07	60	-	-	15717	D
4/3/2007 9:45	55	56	2%	15717	D
4/18/2007 13:45	48	56	17%	14736	D
6/20/2007 10:30	46	48	4%	13651	D
7/2/2007 10:40	43	48	12%	19933	D
7/19/2007 9:15	46	53	15%	19763	D

Date	Hardness as $CaCO_3$ (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Difference	River Flow (cfs)	Water Year Classification
8/6/2007 8:55	52	59	13%	17508	D
8/8/07	96	-	-	17333	D
8/22/2007 8:45	55	64	16%	16202	D
9/20/2007 11:00	59	66	12%	15828	D
10/1/2007 9:10	52	59	13%	17412	D
10/18/2007 10:15	52	56	8%	10608	D
11/21/2007 12:52	65	74	14%	10739	D
12/5/07	66	-	-	10118	D
12/18/2007 10:40	68	79	16%	10660	D
1/2/2008 10:35	77	78	1%	10663	C
1/16/2008 10:07	75	73	3%	18875	C
2/4/2008 12:20	59	58	2%	36920	C
2/21/2008 10:00	90	84	7%	15923	C
3/3/2008 10:50	81	78	4%	22275	C
3/20/2008 10:27	70	74	6%	11743	C
6/2/2008 9:54	59	64	8%	11230	C
6/12/08	42	-	-	10436	C
6/26/2008 8:32	52	54	4%	11925	C
7/1/2008 11:15	59	62	5%	12959	C
7/17/2008 10:05	58	64	10%	13052	C
8/4/2008 12:30	59	66	12%	10822	C
8/21/2008 10:30	72	76	6%	10943	C
9/2/2008 11:52	72	77	7%	11609	C
9/18/2008 9:10	66	72	9%	10231	C
11/3/2008 10:20	68	72	6%	12428	C
2/19/2009 9:42	50	48	4%	34729	D
3/2/2009 10:00	63	64	2%	28333	D
3/18/2009 10:25	79	74	6%	13193	D
4/6/2009 10:40	57	58	2%	12035	D
4/27/2009 12:01	46	49	7%	12056	D
5/4/2009 9:40	46	48	4%	16244	D
5/19/2009 14:45	45	47	4%	12659	D
6/2/2009 12:40	44	48	9%	12529	D
7/6/2009 10:25	42	44	5%	18716	D
8/3/2009 10:00	48	52	8%	18108	D
9/8/2009 9:50	68	70	3%	11709	D
12/15/2009 10:15	74	75	1%	13005	D
1/4/2010 11:27	75	81	8%	11551	-
1/20/2010 18:00	70	74	6%	29988	-
2/1/2010 12:00	64	60	6%	37971	-
2/16/2010 14:45	77	78	1%	26547	-
count	**367**	**286**	**286**	**367**	**-**
min	**30**	**29**	**0%**	**10056**	**-**
max	**110**	**91**	**44%**	**92662**	**-**
average	**57**	**62**	**11%**	**24330**	**-**

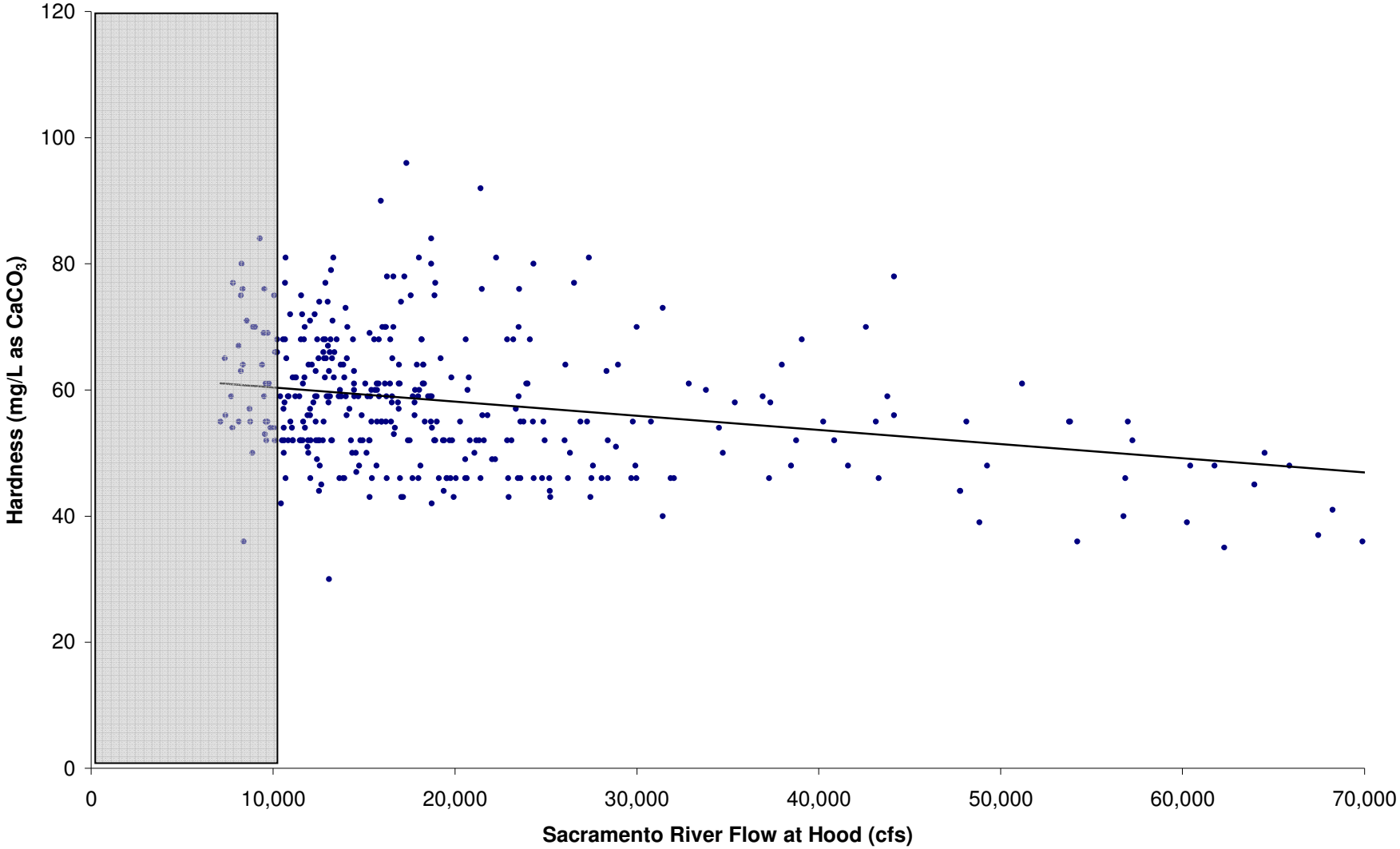



Figure F-1: Background Receiving Water Hardness vs. River Flow