CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2003-0087

NPDES NO. CA0079171

WASTE DISCHARGE REQUIREMENTS FOR CITY OF WEST SACRAMENTO WASTEWATER TREATMENT PLANT YOLO COUNTY

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

BACKGROUND

1. The City of West Sacramento (hereafter Discharger) submitted a Report of Waste Discharge, dated 2 December 2001, and applied for a permit renewal to discharge waste under the National Pollutant Discharge Elimination System (NPDES) from the Wastewater Treatment Plant. Supplemental information to complete filing of the application was submitted on 19 February 2002 and 20 February 2002.

2. The Discharger owns and operates a wastewater collection, treatment, and disposal system, and provides sewerage service to the City of West Sacramento. The treatment plant is in Section 4, T8N, R4E, MDB&M, as shown on Attachment A, a part of this Order. The treatment plant is on property owned by the City of West Sacramento. Treated municipal wastewater is discharged to the Sacramento River, a water of the United States and within the Sacramento/San Joaquin Delta at the point, latitude 38^{o}, 26', 10" and longitude 121^{o}, 31', 34", near Clarksburg (Outfall 001). During extreme wet weather, flows greater than 12 mgd are discharged to the Sacramento River at the treatment plant site (Outfall 002) at the point latitude 38^{o}, 33', 12" and longitude 121^{o}, 31', 12".

3. The treatment system consists of a septage receiving station, a bar screen, primary clarifiers, aeration basin (activated sludge with anoxic selector), secondary clarifiers and chlorination/dechlorination. The aeration basins are operated to nitrify and denitrify, reducing both the ammonia and nitrate concentrations in the wastewater. Sludge is thickened by a gravity thickener prior to anaerobic digestion. The digested sludge is dewatered with belt filter presses then hauled off-site by a private contractor. Screenings and debris are hauled off-site by a private contractor. There are emergency ponds located at the WWTP site.

4. The Discharger is planning to expand its service area and grow within its City limits. To accommodate this growth, the Discharger chose to abandon the existing WWTP and send its wastewater to the Sacramento Regional County Sanitation District (SRCSD) wastewater treatment plant located near Freeport. The Discharger has an agreement with SRCSD to treat and dispose the Discharger's wastewater. The wastewater interceptor to connect the

Discharger with the SRCSD treatment plant is scheduled to be completed by 2007. Factors outside the Discharger's control may limit the Discharger's ability to control the connection schedule and its ability to meet final effluent limits within the time schedule of this Order. If the schedule for connecting to the SRCSD treatment plant is delayed beyond the control of the Discharger, the Order may be reopened, to the extent authorized by law.

5. The Report of Waste Discharge describes the wastewater discharge as follows:

Monthly Average (dry) Flow:	5.08	million gallons per day (mgd)
Daily Peak Wet Weather Flow:	9.78	mgd
Design Flow (dry):	7.5	mgd
Average Temperature:	79°F Summer; 60°F Winter	

Constituent	mg/l	lb/day
BOD[1]	3.6	153
Total Suspended Solids	5.8	246

1 5-day, 20°C biochemical oxygen demand

6. The Regional Board adopted a *Water Quality Control Plan*, *Fourth Edition, for the Sacramento and San Joaquin River Basins* (hereafter Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve water quality objectives for all waters of the Basin. These requirements implement the Basin Plan.

7. The U.S. Environmental Protection Agency (USEPA) adopted the *National Toxics Rule* (NTR) on 5 February 1993 and the *California Toxics Rule* (CTR) on 18 May 2000. These Rules contain water quality standards applicable to this discharge. The State Water Resources Control Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Plan) which contains guidance on implementation of the NTR and the CTR.

RECEIVING WATER BENEFICIAL USES

8. The beneficial uses of the Sacramento River and Sacramento/San Joaquin Delta downstream of the discharge as identified in Table II-1 of the Basin Plan are municipal and domestic supply, agricultural irrigation, agricultural stock watering, industrial process water supply, industrial service supply, water contact recreation, other non-contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat, wildlife habitat, and navigation.

EFFLUENT LIMITATIONS AND REASONABLE POTENTIAL

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

10. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs the Regional Board finds that the discharge does have a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for trihalomethanes, chloromethane, dibromochloromethane, dichlorobromomethane, 1,4-dichlorobenzene, methyl-tert-butyl ether (MTBE), bis(2-ethylhexyl) phthalate, aluminum, cadmium, copper, cyanide, iron, lead, mercury, manganese, thallium, Aldrin, Heptachlor, Lindane, Dalapon, ammonia, chloride, nitrate, nitrite, silver and zinc. Effluent limitations for these constituents are included in this Order.

11. The effluent limitations for all the constituents do not allow for dilution credits. Dilution credits must be documented with flow and water quality data. Since the Discharger elected to connect with the Sacramento Regional County Sanitation District, they chose not to conduct dilution studies. All effluent limitations are end of pipe limits as in the existing permit. However, if new information from a dynamic model, determines dilution credits are available for specific constituents, the permit may be reopened.

12. 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 Sacramento Delta Waterways are listed as a WQLS for mercury, DDT, Chlordane, toxicity, copper, cadmium, lead and toxaphene. The Sacramento Delta is listed in the 303(d) list of impaired water bodies for diazinon, Group A pesticides, mercury, DDT, Chlorpyrifos, electrical conductivity and unknown toxicity. Therefore, the receiving water for the discharge has no assimilative capacity for these constituents and applicable water quality standards must be applied as end-of-pipe effluent limitations if any of these constituents have been detected in the effluent or receiving stream. Mercury and Group A pesticides were detected in the effluent based on the information submitted by the Discharger. The Sacramento Regional County Sanitation District detected lead in the Sacramento River at levels above the CTR criteria and there no assimilative capacity if available for lead in the effluent. Effluent Limitations for those constituents that were detected are included in this Order.

a. **Mercury**—Municipal and domestic supply is a beneficial use of the Sacramento River. The current U.S. EPA Ambient Water Quality Criteria for Protection of Freshwater Aquatic Life, continuous concentration, for mercury is 0.77 µg/*l* (30-day average, chronic criteria). The CTR contains a human health criterion (based on a one-in-a-million cancer risk) of 0.050 µg/*l* for waters from which both water and aquatic organisms are consumed. In 40 CFR Part 131, U.S. EPA acknowledges that the human health criteria may not be protective of some aquatic or endangered species. Both values are controversial and subject to change. In the CTR, U.S. EPA reserved the mercury criteria for freshwater and aquatic life and may adopt new criteria at a later date. The maximum observed effluent mercury concentration was 0.00226 µg/*l*. The Sacramento Delta has been listed as an impaired water body pursuant to Section 303(d) of the Clean Water Act because of mercury. Because the Sacramento Delta has been listed as an impaired water body for mercury, the discharge must not cause or contribute to increased mercury levels. The SIP, Section 1.3, requires the establishment of an effluent limitation for a constituent when the receiving stream background water quality exceeds an applicable criterion or objective. This Order contains Effluent Limitations for mercury based on the CTR human health criterion of 0.050 µg/*l*. This Order also contains a performance-based mass Effluent Limitation of 0.35 lbs/twelve months for mercury for the effluent discharge to the Sacramento River. This limitation is based on maintaining the mercury loading at the current level until a total maximum daily load (TMDL) can be established and U.S. EPA develops mercury standards or criteria that are protective of human health and freshwater aquatic life. The mass limitation was derived using the maximum observed effluent mercury concentration (0.00226 µg/*l*) and the reported average daily effluent flow rate (5.08 mgd). Compliance time schedules have not been included since the discharge currently meets the concentration based limitation and the mass limitation can be met through source control measures and/or by limiting new sewer discharges containing mercury concentrations. If U.S. EPA develops new water quality standards or criteria for mercury, this permit may be reopened and the Effluent Limitations adjusted.

b. **Group A Pesticides (Organochlorine Pesticides)**—Based on information included in analytical laboratory reports submitted by the Discharger, lindane (gamma BHC), aldrin and heptachlor, organochlorine pesticides, in the discharge have a reasonable potential to cause or contribute to an in-stream excursion above promulgated CTR criteria for these individual constituents. However, the Basin Plan requires that: no individual pesticides shall be present in concentrations that adversely affect beneficial uses; discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses; total chlorinated hydrocarbon pesticides shall not be present in the water column at detectable concentrations; and pesticide concentrations shall not exceed those allowable by applicable antidegradation policies. The detection of lindane, aldrin and heptachlor in the WWTF effluent presents a reasonable potential to exceed the Basin Plan limitations for organochlorine pesticides. In addition to lindane (gamma BHC), aldrin, and heptachlor, the organochlorine pesticides include alpha BHC, beta BHC, delta BHC, DDD, DDE, DDT, chlordane, dieldrin, endrin and endrin aldehyde, alpha and beta endosulfan and endosulfan sulfate, and heptachlor epoxide, and toxaphene. Effluent Limitations for

organochlorine pesticides at nondetectable concentrations are included in this Order and are based on Basin Plan objectives.

c. **Lead -** Lead is a heavy metal and was detected in the Sacramento River as high as 1.5 µg/l in December 2001 by the Sacramento Regional County Sanitation District. Therefore, there is no assimilative capacity for lead in the receiving stream. Lead toxicity is hardness dependent. The CTR criteria for lead is 0.57 µg/l for the 4-day chronic limit and 15 µg/*l* for the 1-hour acute limit at the worst-case scenario of 26 mg/l hardness in the Sacramento River. Effluent limits for lead are included in this Order based on the CTR, and are presented in total concentration.

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

The Regional Board has adopted numeric and narrative receiving water objectives in the Basin Plan. Based on a reasonable potential analysis and the methods prescribed in the SIP, the following constituents present a reasonable potential to exceed water quality objectives or standards: organochlorine pesticides and pH in the Basin Plan. As detailed elsewhere in this Permit, available effluent quality data indicate that effluent concentrations of organochlorine pesticides and pH do have a reasonable potential to cause or contribute to a violation of numeric water quality objectives for these constituents. The EPCRKA Section 313 toxic chemical release data report indicates that organochlorine pesticides and acidic or basic wastewaters discharge into the Discharger's collection system. Effluent limitations for organochlorine pesticides and pH are included in this permit pursuant to CWC Section 13263.6(a).

a. **Organochlorine Pesticides -** See discussion in Finding No. 12. b. A limit for organochlorine pesticides is included in this Order.

b. **pH –** The Basin Plan states "*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 water with designated COLD or WARM beneficial uses"* A limit for pH is included in this Order.

14. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative water quality standard. The Basin Plan prohibits the discharge of toxic substances in toxic amounts and on page III-8.00, the Basin Plan contains a narrative Toxicity Objective. The Regional Board finds that the discharge does have a reasonable

potential to cause or contribute to an in-stream excursion above the Basin Plan narrative Toxicity Objective for Aluminum, Ammonia, Chlorine Residual, and Dalapon:

a. **Aluminum**- Aluminum can be toxic to aquatic organisms. Based on information included in analytical laboratory reports submitted by the Discharger, the discharge contained concentrations of aluminum as high as 230 µg/l. The U. S. EPA National Recommended Ambient Water Quality Criteria for protection of freshwater aquatic life for aluminum are 87 µg/l for the acute limit and 750 µg/l for the chronic limit. In addition, the Chemical Constituents Objective also prohibits chemical constituents in excess of California Maximum Contaminant Levels (MCLs) for waters designated MUN. An effluent limitation, based on preventing toxicity has been included in this permit.

b. **Ammonia**- Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrate. Wastewater treatment plants commonly use nitrification to remove ammonia from the waste stream. Inadequate or incomplete nitrification may result in the discharge of ammonia to the receiving stream. Ammonia is known to cause toxicity to aquatic organisms in surface waters. U. S. EPA has developed Ambient Water Quality Criteria for the protection of freshwater aquatic life for ammonia. . U.S. EPA has published tables for pH and temperature-dependent Ambient Water Quality Criteria for ammonia criteria. The pH and temperature of the Sacramento River should be used for determining the chronic (monthly) limit. The effluent pH should be used for determining the acute (1-hour) limit for ammonia. Effluent limitations for ammonia are included in this Order to assure the treatment process adequately nitrifies the water stream to protect the beneficial uses of the receiving stream and to prevent aquatic toxicity.

c. **Chlorine**- Chlorine is commonly used as a disinfection agent in the treatment of wastewater. The Discharger uses chlorine for disinfection at its WWTP. For dechlorination, the Discharger uses sulfur dioxide, which combines with chlorine, to render it relatively unreactive and thus removes it from the waste stream. Inadequate dechlorination may result in discharge of chlorine to the receiving stream and cause toxicity to aquatic organisms. For chlorine, U. S. EPA has developed Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life. The maximum concentration for chlorine is 0.019 mg/l(1-hour average) and the chronic (4-day) average is 0.011 mg/l. Effluent Limitations for chlorine have been included in this Order to protect the receiving stream aquatic life beneficial uses.

d. **Dalapon**- Dalapon can be toxic to aquatic organisms. Based on information included in analytical laboratory reports submitted by the Discharger, the discharge contained concentrations of Dalapon at 26 µg/l. The U. S. EPA National Recommended Ambient Water Quality Criteria for protection or freshwater aquatic life for Dalapon is 110 µg/l. Additionally, the California primary MCL for Dalapon is 200 µg/l. Although the effluent concentration is lower than the Ambient Water Quality Criteria, a statistical analysis shows the discharge has a reasonable potential to cause violation of the Basin Plan prohibition

against the discharge of toxic constituents for dalapon. An effluent limitation has been included in this permit.

15. 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*." Municipal and domestic supply is a beneficial use of the receiving stream. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a numerical water quality standard. The Regional Board finds that the discharge does have a reasonable potential to cause or contribute to an in-stream excursion above the numerical standards included in the California Drinking Water Standards Primary Maximum Contaminant Level (PMCL) and/or Secondary Maximum Contaminant Level for1,4,-Dichlorobenzene, Iron, Manganese, Methyl-tert-butyl ether(MTBE), Nitrate plus Nitrite, Nitrite and Total Trihalomethanes:

a. **1,4-Dichlorobenzene** Based on information submitted by the Discharger the discharge has reasonable potential to cause or contribute to an in stream excursion above the California Drinking Water Standards Primary MCL for 1,4-dichlorobenzene. The Primary MCL for 1,4-dichlorobenzene is 5.0 µg/l. On 23 September 2002 the sampling results showed a concentration of 1,4-dichlorobenzene at 5.0 µg/l. An Effluent Limitation for 1,4-dichlorobenzene is included in this Order.

b. **Iron**— Based on information included in analytical laboratory reports submitted by the Discharger, iron in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Secondary Maximum Contaminant Level (MCL)-Consumer Acceptance Limit of 300 µg/*l*. The Basin Plan also includes a water quality objective that water "…*shall be free of discoloration that causes nuisance or adversely affects beneficial uses*." The Basin Plan identifies non-contact water recreation, which includes aesthetic enjoyment, as a beneficial use of the Sacramento River. Iron concentrations in excess of the Secondary MCL-Consumer Acceptance Limit cause aesthetically undesirable discoloration. The maximum observed effluent iron concentration was 210 µg/*l*. Although the concentration is lower than the standard, using statistical analysis iron has a reasonable potential to cause or contribute to an in stream excursion above the Secondary MCL. An Effluent Limitation for iron is included in this Order.

c. **Manganese**- Based on information included in analytical laboratory reports submitted by the Discharger, high concentrations of manganese are in effluent. U.S. EPA and California developed Drinking Water Secondary MCL's for manganese and the limit is 50 µg/l. Effluent concentrations of manganese were as high as 55 µg/l. Effluent limitations for manganese are included in this Order.

d. **Methyl-tert-butyl (MTBE)**- Based on information included in analytical laboratory reports submitted by the Discharger, MTBE in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Secondary Maximum Contaminant Level (MCL)-Consumer Acceptance Limit of 5 µg/*l* for MTBE. The maximum observed effluent MTBE concentration was 220 µg/*l*. An Effluent Limitation for MTBE is included in this Order.

e. **Nitrate + Nitrite and Nitrite**-Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrate, and denitrification is a process that converts nitrate to nitrogen gas, which is then released to the atmosphere. Wastewater treatment plants commonly use nitrification and denitrification processes to remove ammonia and nitrates from the waste stream. Inadequate or incomplete nitrification and denitrification may result in the discharge of ammonia or nitrate to the receiving stream.

Nitrate and nitrite are known to cause adverse health effects in humans. The California Primary Maximum Contaminant Levels (MCLs) for the protection of human health for nitrite, and the sum of nitrate and nitrite are 1 mg/*l* and 10 mg/*l*, respectively. The maximum observed effluent nitrate concentration was 18 mg/*l*. Effluent Limitations for ammonia, nitrite, and nitrate are included in this Order to assure the treatment process adequately nitrifies and denitrifies the waste stream so as to protect both human health and aquatic life.

f. **Total Trihalomethanes**- The U.S. EPA has established a primary MCL for total trihalomethanes, the sum of bromoform, bromodichloromethan, chloroform and dibromochloromethane at 80 µg/l , which is lower than the current MCL of 100 µg/l. The Safe Drinking Water Act requires that California Department of Health Services has proposed to revise regulations in Title 22 of CCR to establish a California MCL for total trihalomethanes at 80 µg/l. To protect future municipal and domestic supply beneficial uses, this Order establishes an Effluent Limitation for total trihalomethanes. Based on information included in analytical laboratory results submitted by the Discharger, the discharge was found to have a maximum concentration of 77.0 µg/l of total trihalomethanes. A statistical shows there is reasonable potential to exceed the 80 µg/l MCL. Therefore, an Effluent Limitation for total trihalomethanes is included in this Order.

16. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a numerical or narrative water quality standard. Municipal and domestic supply is a beneficial use of the receiving stream. The narrative toxicity objective and this beneficial use designation comprise a water quality standard applicable to pollutants in the receiving stream. The Basin Plan contains the *Policy for Application of Water Quality Objectives*, which provides that narrative objectives may be translated using numerical limits published by other agencies and organizations. The Regional Board finds that the discharge

does have a reasonable potential to cause or contribute to an in-stream excursion above water quality standards for Chloroform and Chloromethane as follows:

a. **Chloroform** - The Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA) has published 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 Cal/EPA. The OEHHA cancer potency value for oral exposure to chloroform is 0.031 milligrams per kilogram body weight per day (mg/kg-day). By applying standard toxicologic assumptions used by OEHHA and USEPA in evaluating health risks via drinking water exposure of 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. This risk level is consistent with that used by the Department of Health Services (DHS) to set *de minimis* risks from involuntary exposure to carcinogens in drinking water in developing MCLs and Action Levels and by OEHHA to set negligible cancer risks in developing Public Health Goals for drinking water. The one-in-a-million cancer risk level is also mandated by USEPA in applying human health protective criteria contained in the National Toxics Rule and the California Toxics Rule to priority toxic pollutants in California surface waters. Based on information included in analytical laboratory results submitted by the Discharger, the discharge was found to have an average concentration of 19.9 µg/l, with a maximum concentration of 44 µg/l of chloroform. Therefore, an Effluent Limitation for chloroform is included in this Order.

b. **Chloromethane**- Based on information submitted by the Discharger the discharge has reasonable potential to cause or contribute to an in stream excursion above the USEPA Drinking Water Health Advisory for chloromethane of 3.0 µg/l. On 21 September 1999 the sampling results showed a concentration of chloromethane at 3.9 µg/l. Therefore, an Effluent Limitation for chloromethane is included in this Order.

17. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a numerical water quality standard. The U.S. EPA adopted a *National Toxics Rule* (NTR) and a *California Toxics Rule* (CTR) that contain numerical water quality standards for many wastewater constituents The *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Plan or SIP), adopted by the State Water Resources Control Board, contains guidance on implementation of the NTR and the CTR criteria. These Rules contain water quality standards applicable to this discharge. The Regional Board finds that the discharge does have a reasonable potential to cause or contribute to an in-stream excursion above numerical water quality standards in the CTR for Bis(2-ethylhexyl)phthalate, Cadmium, Copper, Cyanide, Dibromochloromethane, Dichlorobromomethane, Mercury, Silver, Lead, Zinc and Thallium.

Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB* [Regional Water Quality Control Board] *may establish a compliance schedule in an NPDES permit.*" Section 2.1 states further that compliance schedules may be included in NPDES permits provided that the following justification has been submitted: "*(a) documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream; (b) documentation of source control measures and/or pollution minimization efforts currently underway or completed; (c) a proposal for additional or future source control measures, pollutant minimization actions, or waste treatment (i.e., facility upgrades); and (d) a demonstration that the proposed schedule is as short as practicable."* This Order requires the Discharger to provide this information. If justification for compliance schedules is **not** completed and submitted by the Discharger to the Regional Board, the new water quality based Effluent Limitations for Bis(2-ethylhexyl)phthalate, Cadmium, Copper, Cyanide, Dibromochloromethane, Dichlorobromomethane, Mercury, Silver, Lead, Zinc and Thallium become effective on **first weekday of the month following 60 days after adoption**. If compliance schedules are justified and implemented, then the final water quality based effluent limitations for Bis(2-ethylhexyl)phthalate, Cadmium, Copper, Cyanide, Dibromochloromethane, Dichlorobromomethane, Mercury, Lead, Silver, Zinc and Thallium become effective **30 June 2008**. This Order contains a Provision with a compliance schedule for implementation of effluent limitations Bis(2-ethylhexyl)phthalate, Cadmium, Copper, Cyanide, Dibromochloromethane, Dichlorobromomethane, Silver, Lead, Mercury, Zinc and Thallium.

a. **Bis(2-ethylhexyl) phthalate-** The CTR includes a criterion for the protection of human health based on a one-in-a-million cancer risk for bis(2-ethylhexyl) phthalate of 1.8 µg/*l*. In addition, the California primary MCL for bis(2-ethylhexyl) phthalate is 4 µg/l. Municipal and domestic supply is a beneficial use of the receiving water. The maximum observed effluent bis(2-ethylhexyl) phthalate concentration was 66 µg/*l*. Effluent Limitations for bis(2-ethylhexyl) phthalate are included in this Order.

b. **Cadmium**— The CTR includes hardness-dependent criteria for cadmium. The criteria for cadmium and several other metals are presented in dissolved concentrations. U.S. EPA recommends conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for cadmium in freshwater are 1.101672-[0.041838 X ln(hardness)] for the chronic criteria and 1.136672-0.041838 X ln(hardness)] for the acute criteria. Using the worst-case lowest hardness of the Sacramento River measured by SRCSD is 26 mg/l, the corresponding total recoverable concentration criteria standards are 0.99 µg/*l* and 0.85 µg/*l* for the acute and chronic criteria, respectively. The maximum observed effluent cadmium concentration was 4.0 µg/*l*. The Effluent Limitations for cadmium included in this Order.

c. **Copper**- The CTR standards for metals are presented in dissolved concentrations. U.S. EPA recommends conversion factors to translate dissolved concentrations to total

concentrations. The conversion factors for copper in freshwater are 0.960 for both the acute and the chronic criteria. Using the worst-case, lowest of hardness of the Sacramento River measured by SRCSD is 26 mg/l, the corresponding standards for total copper are 3.9 µg/*l* and 3.0 µg/*l* for the acute and chronic criteria, respectively. The maximum observed effluent copper concentration was 13.0 µg/l. The effluent limitations for copper are presented in total recoverable concentrations, and included in this Order.

d. **Cyanide**- Cyanide was detected in an effluent sample collected 25 June 1999 at a concentration of 16 µg/l. The CTR continuous concentration (four-day average concentration) is 5.2 µg/l and the recommended maximum concentration (one-hour average concentration) is 22 µg/l. Effluent limitations for cyanide are included in this Order.

f. **Dibromochloromethane**- The criteria for waters from which both water and organisms are consumed is 0.41 µg/*l*. The maximum observed effluent dibromochloromethane concentration was 9.5 µg/*l*. Effluent Limitations for dibromochloromethane are included in this Order.

g. **Dichlorobromomethane**- The criterion for waters from which both water and organisms are consumed is 0.56 µg/*l*. The maximum observed effluent dichlorobromomethane concentration was 18 µg/*l*. Effluent Limitations for dichlorobromomethane are included in this Order.

h. **Thallium**- The CTR criterion for thallium is 0.17 µg/l. The maximum observable concentration for thallium is 4.8 µg/l. Effluent limit for thallium is included in this Order.

i. **Lead** – See discussion in Finding No. 12 c. A limit for lead is included in this Order.

j. **Mercury** - See discussion in Finding No. 12 a. A limit for mercury is included in this Order.

k. **Silver**- The CTR criterion for metals are presented in dissolved concentrations. U.S. EPA recommends conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for silver in freshwater are 0.850 for the instantaneous maximum criteria. Using the worst-case, lowest of hardness of the Sacramento River measured by SRCSD is 26 mg/l, the corresponding standards for total silver is 0.4 µg/*l* as an instantaneous maximum. The maximum observed effluent silver concentration was 2.2 µg/l. The effluent limitation for silver is presented in total recoverable concentration, and included in this Order.

l. **Zinc -** Based on information included in analytical laboratory reports submitted by the Discharger, the discharge has a reasonable potential to cause or contribute to an in stream excursion above the CTR for zinc. Using the worst-case, lowest of hardness of the Sacramento River measured by SRCSD is 26 mg/l, the corresponding criterion for total

zinc are 38 µg/*l* and 38 µg/*l* for the acute and chronic criteria, respectively. The maximum observable concentration for zinc is 1300 µg/l. An effluent limit for zinc is included in this Order and is based on the CTR.

18. The *SIP* states that if "*…all reported detection limits of the pollutant in the effluent are greater than or equal to the C* [water quality criterion or objective] *value, the RWQCB* [Regional Board] *shall establish interim requirements…that require additional monitoring for the pollutant….*" All reported detection limits for 1,1,2,2-tetrachloroethane, 1,2-dichloroethane, acrylonitrile, carbon tetrachloride, hexachlorobenzene, hexachlorobutadiene, 1,2-benzanthracene; 1,2-diphenylhydrazine, 2-chlorophenol, 2,4-dichlorophenol, 2,4-dinitrotoluene; 2,6-dinitrotoluene, 3,3'-dichlorobenzidine; 3,4-benzfluoranthene; benzidine; benzo(a)pyrene; benzo(k)fluoranthene; bis(2-chloroethyle) ether; chrysene; dibenzo (a,h)-anthracene; indeno(1,2,3-c,d)pyrene; N-nitrosodimethylamine; N-nitrosodi-n-propylamine; 4,4'-DDD; 4,4'-DDE; alpha-hexachlorocyclohexane (α-BHC); aldrin; chlordane; dieldrin; heptachlor; heptachlor epoxide; PCB-1016; PCB-1221; PCB-1232; PCB-1242; PCB-1248; PCB-1254; PCB-1260; carbofuran, 1,2-dibromo-3-chloropropane, diquat, ethylene dibromide and 2,3,7,8-TCDD (Dioxin) are greater than or equal to corresponding applicable water quality criteria or objectives. Monitoring for these constituents has been included in this Order in accordance with the SIP.

TERTIARY TREATMENT

19. The Sacramento River has the beneficial uses of contact recreation and agricultural irrigation. Additionally, the State Water Resources Control Board has issued water right permits for agricultural irrigation downstream of the City of West Sacramento's discharge. The outfall for the City of West Sacramento is located approximately 3 miles downstream from the Sacramento Regional County Sanitation District (SRCSD) outfall on the Sacramento River. Order No. 5-00-188, NPDES Permit No. CA0077682 for the Sacramento Regional County Sanitation District includes Finding Nos. 6 and 7 that state that the Sacramento River in the vicinity of the SRCSD outfall is influenced by tides. As a result of the slack flows, flow reversals can occur. The current average dry weather flow for SCRSD is 165 mgd (255 cfs). The Department of Health Services recommends a 20:1 dilution of surface water to secondary effluent or tertiary treatment if contact recreation and agricultural irrigation are beneficial uses of the water body. Review of the self-monitoring reports for SRCSD indicates at times there is less than 20:1 dilution. If there is less than 20:1 dilution with the discharge from SRCSD then the added flows from the City of West Sacramento reduces the dilution ratio further. Since the City of West Sacramento is planning to connect to the SRCSD plant, within the five-year life of this permit, tertiary treatment is not being required at this time. Until the City connects to the SRCSD treatment plant, the DHS recommends the effluent does not exceed an MPN of 23 per 100 milliliters utilizing the results of the last seven days for which analyses have been completed and the total coliform bacteria does not exceed an MPN of 240 per 100 milliliters in more than sample in any 30 day period. However, if the City of West Sacramento does not connect to the SRCSD then this Order may be reopened to consider tertiary treatment limits.

INTERIM LIMITATIONS

20. As stated in the above Findings, the U.S. EPA adopted the NTR and the CTR, which contains water quality criteria applicable to this discharge and the SIP that contains guidance on implementation of the NTR and CTR. The SIP, Section 2.2.1, requires that if a compliance schedule is granted for a CTR or NTR constituent, the Regional Board shall establish interim requirements and dates for their achievement in the NPDES permit. The interim limitations must: be based on current treatment plant performance or existing permit limitations, whichever is more stringent; include interim compliance dates separated by no more than one year, and; be included in the Provisions. The interim limitations in this Order are based on the current treatment plant performance. In developing the interim limitation, where there are ten sampling data points or more, sampling and laboratory variability is accounted for by establishing interim limits that are based on normally distributed data where 99.9% of the data points will lie within 3.3 standard deviations of the mean (*Basic Statistical Methods for Engineers and Scientists, Kennedy and Neville, Harper and Row*). Therefore, the interim limitations in this Order are established as the mean plus 3.3 standard deviations of the available data. Where actual sampling shows an exceedance of the proposed 3.3-standard deviation interim limit, the maximum detected concentration has been established as the interim limitation. When there are less than ten sampling data points available, the *Technical Support Document for Water Quality Based Toxics Control* ((EPA/505/2-90-001)TSD) recommends a coefficient of variation of 0.6 be utilized as representative of wastewater effluent sampling. The TSD recognizes that a minimum of ten data points is necessary to conduct a valid statistical analysis. The multipliers contained in Table 5-2 of the TSD are used to determine a maximum daily limitation based on a long-term average objective. In this case, the long-term average objective is to maintain, at a minimum, the current plant performance level. Therefore, when there are less than ten sampling points for a constituent, interim limitations are based on 3.11 times the maximum observed sampling point to obtain the daily maximum interim limitation (*TSD, Table 5-2*). The Regional Board finds that the Discharger can undertake source control and treatment plant measures to maintain compliance with the interim limitations included in this Order. Interim limitations are established when compliance with NTR- and CTR-based Effluent Limitations cannot be achieved by the existing discharge. Discharge of constituents in concentrations in excess of the final Effluent Limitations, but in compliance with the interim Effluent Limitations, can significantly degrade water quality and adversely affect the beneficial uses of the receiving stream on a long-term basis. For example, U.S. EPA states in the Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life for copper, that it will take an unstressed system approximately three years to recover from a pollutant in which exposure to copper exceeds the recommended criterion. The interim limitations, however, establish an enforceable ceiling concentration until compliance with the Effluent Limitation can be achieved.

PRETREATMENT

21. The Discharger accepts wastes from industries located throughout the community. The Discharger has estimated that 12% of the hydraulic capacity of the wastewater treatment plant is utilized by industrial discharges. The source of pollutants that have been limited by this Order may be from industrial discharges. The Federal Clean Water Act, Section 307(b), and

Federal Regulations, 40 CFR Part 403, require publicly owned treatment works to develop an acceptable industrial pretreatment program. A pretreatment program is required to prevent the introduction of pollutants that will interfere with treatment plant operations or sludge disposal and prevent pass through of pollutants that exceed water quality objectives, standards or permit limitations. The City of West Sacramento has a pretreatment program and staff to support the program.

GROUNDWATER

22. The Discharger owns and operates an unlined emergency storage pond and concrete lined pond at the treatment plant site. Historically, the ponds have been used for emergency storage of wastewater and the temporary storage of sludge. The area is adjacent to the Sacramento River and has a shallow groundwater table. The use of the ponds on a short-term emergency basis, for treated wastewater, does not pose a significant threat to groundwater quality. The use of the ponds for the storage of untreated or partially treated wastewater or sludge threatens groundwater quality. The beneficial uses of the underlying ground water, as identified in the Basin Plan, are municipal and domestic, industrial service, industrial process, and agricultural supply. Should the Discharger store untreated or partially treated wastewater or sludge in the bypass ponds, monitoring wells shall be installed and monitoring of the groundwater must be conducted to determine if the discharge has caused an increase in constituent concentrations, when compared to background. Therefore, in accordance with the Antidegradation Policy, this Order requires the discharge not degrade groundwater quality.

23. Basin Plan water quality objectives to protect the beneficial uses of groundwater include numeric objectives and narrative objectives, including objectives for bacteria, chemical constituents, toxicity of groundwater, and taste and odor. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, or animals. The chemical constituent objective states 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 groundwater shall not contain taste- or odor-producing substances in concentrations that couse nuisance or adversely affect beneficial uses. The bacteria objective requires that in groundwaters designated for use as domestic or municipal supply (MUN) the most probable number of coliform organisms over any seven – day period shall be less than 2.2/100 ml. The Basin Plan requires the application of the most stringent objective necessary to ensure that groundwaters 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.

24. State Water Resources Control Board (SWRCB) Resolution No. 68-16 (hereafter Resolution 68-16) requires the Regional Board in regulating discharge of waste to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Board's policies (e.g.,

quality that exceeds water quality objectives). Resolution 68-16 requires that the discharge be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained. The Board finds that providing best practicable treatment at this facility will prevent pollutants from migrating to groundwater. Groundwater shall not be degraded when compared to background water quality.

25. Should the Discharger store untreated or partially treated wastewater or sludge in the bypass ponds, monitoring wells shall be installed and monitoring of the groundwater must be conducted to determine if the discharge has caused an increase in constituent concentrations, when compared to background. The monitoring must, at a minimum, require a complete assessment of groundwater impacts including the vertical and lateral extent of degradation, an assessment of all wastewater-related constituents which may have migrated to groundwater, an analysis of whether additional or different methods of treatment or control of the discharge are necessary to provide best practicable treatment or control to comply with Resolution No. 68-16. Economic analysis is only one of many factors considered in determining best practicable treatment or control. If monitoring indicates that the discharge has incrementally increased constituent concentrations in groundwater above background, this permit may be reopened and modified.

26. 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.

COLLECTION SYSTEM

27. The Discharger's sanitary sewer system collects wastewater using sewers, pipes, pumps, and/or other conveyance systems and directs this 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. Temporary storage and conveyance 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/conveyance facilities.

28. Sanitary sewer overflows consist of varying mixtures of domestic sewage, industrial wastewater, and commercial wastewater. This mixture depends on the pattern of land use in the sewage collection system tributary to the overflow. The chief causes of sanitary sewer overflows include grease blockages, root blockages, debris blockages, sewer line flood damage, manhole structure failures, vandalism, pump station mechanical failures, power outages, storm or groundwater inflow/infiltration, lack of capacity, and contractor caused blockages.

29. Sanitary sewer overflows often contain high levels of suspended solids, pathogenic organisms, toxic pollutants, nutrients, oxygen demanding organic compounds, oil and grease, and other pollutants. Sanitary sewer overflows can cause temporary exceedences of applicable water quality objectives, pose a threat to public health, adversely affect aquatic life, and impair the public recreational use and aesthetic enjoyment of surface waters in the area.

30. The Discharger is responsible for taking all necessary steps to adequately maintain and operate its sanitary sewer collection system. This Order requires the Discharger to prepare and implement a Sanitary Sewer System Operation, Maintenance, Overflow Prevention, and Response Plan.

GENERAL

31. The discharge is presently governed by Waste Discharge Requirements Order No. 97-110, adopted by the Regional Board on 20 June 1997.

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

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

34. The U.S. Environmental Protection Agency (USEPA) and the Regional Board have classified this discharge as a major discharge.

35. The Regional Board has considered the information in the attached Information Sheet in developing the Findings of this Order. The attached Information Sheet is part of this Order.

36. The attached Monitoring and Reporting Program No. R5-2003-0087, and Attachments A through E are a part of this Order.

37. The Regional Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and

recommendations.

38. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.

39. This Order shall serve as an NPDES permit pursuant to Section 402 of the CWA, and amendments thereto, and shall take effect upon the (50 days after the date of hearing), provided EPA has no objections.

IT IS HEREBY ORDERED that Order No. 97-110 is rescinded and the City of West Sacramento, its agents, successors and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. Discharge Prohibitions:

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

2. The by-pass or overflow of wastes is prohibited, except as allowed by Standard Provision A.13. [See attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)"].

3. Neither the discharge nor its treatment shall create a nuisance as defined in Section 13050 of the California Water Code.

Effluent Limitations:

4. Effluent shall not exceed the following limits for outfalls 001 and 002:

Constituents	Units	Monthly Average	Weekly Average	7-day Median	Daily Maximum
BOD[1]	mg/l	30[2]	45[2]	---	60[2]
	lb/day[3]	1878	2816	---	3756
Total Suspended	mg/l	30[2]	45[2]	---	60[2]
Solids	lb/day[3]	1878	2816	---	3756
Total Coliform Organisms	MPN/100ml	---	---	23	240
Settleable Solids	ml/l	---	---	---	0.1
Total Oil & Grease	mg/l	10	---	---	15
	lbs/day	625	---	---	940

[1] 5-day, 20°C biochemical oxygen demand (BOD)
[2] To be ascertained by a 24-hour composite

[3] Based upon a design treatment capacity of 7.5 mgd.

Constituents	Units	Average Monthly	Average 4-Day	Average Daily	Average 1-Hour	Instantaneous Maximum
Ammonia (as N)	mg/l	Attachment C	---		Attachment B	
	lbs/day[1]		---		---	
Nitrate + Nitrite (as N)	mg/l	10	---		---	
	lbs/day[1]	625	---		---	
Nitrite (as N)	mg/l	1	---		---	
	lbs/day[1]	---	---		---	
Chlorine Residual	mg/l	---	0.01		0.02	
	lbs/day[1]	---	0.625		1.25	
Total Trihalomethanes	µg/*l*	80.0	---		---	
	lbs/day[1]	5.0	---		---	
Chloroform	µg/*l*	1.1				
	lbs/day[1]	0.69				
Chloromethane	µg/*l*	3.0	---		---	
	lbs/day[1]	0.2	---		---	
1,4-Dichlorobenzene	µg/*l*	5.0				
	lbs/day[1]	0.3				
Methyl-tert-butyl ether	µg/*l*	5.0	---		---	
	lbs/day[1]	0.3	---		---	
Aluminum	µg/*l*	---	87		750	
	lbs/day[1]	---	5.5		47	
Iron	µg/*l*	300	---		---	
	lbs/day[1]	19.0	---		---	
Manganese	µg/*l*	50	---		---	
	lbs/day[1]	3.1	---		---	
Organochlorine Pesticides	µg/*l*	Non-detect	---		---	
	lbs/day[1]	0	---		---	
Dalapon	µg/*l*	---	---	---	---	110
	lbs/day[1]	---	---		---	7.0

[1] Based upon a design treatment capacity of 7.5 mgd (*x* mg/*l* x 8.345 x 7.5 mgd = *y* lbs/day)

5. In addition to the limitations above, the effluent discharge to the Sacramento River (001 and 002) shall not exceed the following limitations (**from 30 June 2008**) forward):

Constituents	Units	Average Monthly	Average 4-Day	Average Daily	Instantaneous Maximum
Cadmium	µg/*l*	Attachment D	Attachment D	Attachment D	
	lbs/day[1]	---	---		
Dibromochloromethane	µg/*l*	0.41	---		
	lbs/day[1]	0.025	---		
Dichlorobromomethane	µg/*l*	0.56	---		
	lbs/day[1]	0.035	---		
Bis(2-ethylhexyl) phthalate	µg/*l*	1.8	---		
	lbs/day[1]	0.11	---		
Cyanide	µg/*l*	4.25	5.2	8.52	
	lbs/day[1]	0.266	0.33	0.5332	
Copper	µg/*l*	Attachment E	Attachment E	Attachment-E	
	lbs/day[1]	---	---		
Lead	µg/*l*	Attachment F	Attachment F	Attachment F	
	lbs/day[1]				
Mercury	µg/*l*	0.05	-		
	lbs/day[2]	0.0313	---		
Silver	µg/*l*				Attachment G
	lbs/day[2]				
Thallium	µg/*l*	1.7	---		
	lbs/day[1]	0.1	---		
Zinc	µg/*l*	Attachment H	Attachment H	Attachment H	
	lbs/day[1]				

[1] Based upon a design treatment capacity of 7.5 mgd (*x* mg/*l* x 8.345 x 7.5 mgd = *y* lbs/day)
[2] Based on ADWF of 5.08 mgd x 0.05 µg/l x 8.345

6. Interim Limitations (**from adoption of the permit to 30 June 2008**):

Constituents	Units	Average Monthly
Dibromochloromethane	µg/*l*	10.1
Dichlorobromomethane	µg/*l*	23.5
Bis(2-ethylhexyl) phthalate	µg/*l*	66
Cyanide	µg/*l*	16.0
Cadmium	µg/*l*	4.0
Mercury	µg/*l*	0.05
Copper	µg/*l*	13.0
Lead	µg/*l*	1.7
Silver	µg/*l*	2.2
Thallium	µg/*l*	4.8
Zinc	µg/*l*	1300

7. The arithmetic mean of 20°C BOD (5-day) and total suspended solids in effluent samples collected over a monthly period shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85 percent removal).

8. The discharge shall not have a pH less than 6.5 nor greater than 8.5as determined by a 1-hour average of continuous monitoring data. The continuous monitoring data shall be divided into 1-minute periods for determining an average.

9. The average dry weather discharge flow shall not exceed 7.5 million gallons per day.

10. The effluent mass mercury loading to the Sacramento River shall not exceed 0.35 pound per year.

    a. In calculating for compliance, the Discharger shall count all non-detect results at one half of the method detection limit and shall apply the monthly average flow from the discharge. If compliance with the effluent limit is not attained due to the non-detect contribution, the Discharger shall improve and implement available analytical capabilities and compliance will be evaluated with consideration of the detection limits.

    b. Twelve month mass loadings shall be calculated for each calendar month. For monthly measures, calculate monthly loadings using average monthly flow and the average of all mercury analyses conducted that month. The Discharger shall submit a cumulative total of mass loadings for the previous twelve months with each self-monitoring report. Compliance will be determined based on monitoring results from the previous twelve calendar months.

11. Survival of aquatic organisms in the flow through bioassays of undiluted waste shall be no less than:

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

12. The discharge of treated disinfected municipal wastewater is prohibited at outfall 002 except when outfall 001 is at hydraulic capacity and the Sacramento River flow is greater than 80,000 cubic feet per second (cfs).

B. Sludge Disposal:

1. Collected screenings, sludges, 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.

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

3. Use and disposal of sewage sludge shall comply with existing Federal and State laws and regulations, including permitting requirements and technical standards included in 40 CFR 503.

   If the State Water Resources Control Board and the Regional Water Quality Control Boards are given the authority to implement regulations contained in 40 CFR 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 503 whether or not they have been incorporated into this Order.

4. 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.

5. By 1 August 2003, the Discharger shall submit a sludge disposal plan describing the annual volume of sludge generated by the plant and specifying the disposal practices.

C. Receiving Water Limitations:

Receiving Water Limitations are based upon water quality objectives contained in the Basin Plan. As such, they are a required part of this permit.

The discharge shall not cause the following in the receiving water:

1. Concentrations of dissolved oxygen to fall below 7.0 mg/l. The monthly median of the mean daily dissolved oxygen concentration shall not fall below 85 percent of saturation in the main water mass, and the 95th percentile concentration shall not fall below 75 percent of saturation.

2. Oils, greases, waxes, or other materials to form a visible film or coating on the water surface or on the stream bottom.

3. Oils, greases, waxes, floating material (liquids, solids, foams, and scums) or suspended material to create a nuisance or adversely affect beneficial uses.

4. Esthetically undesirable discoloration.

5. Fungi, slimes, or other objectionable growths.

6. The turbidity to increase as follows:

   a. More than 1 Nephelometric Turbidity Units (NTUs) 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 NTUs where natural turbidity is between 50 and 100 NTUs.

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

7. The ambient pH to fall below 6.5, exceed 8.5, or the 30-day average to change by more than 0.5 units.

8. The ambient temperature to increase more than 5°F.

9. Deposition of material that causes nuisance or adversely affects beneficial uses.

10. Radionuclides to be present in concentrations that exceed maximum contaminant levels specified in the California Code of Regulations, Title 22; that harm human, plant, animal or aquatic life; or 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.

11. Aquatic communities and populations, including vertebrate, invertebrate, and plant species, to be degraded.

12. Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.

13. Violation of any applicable water quality standard for receiving waters adopted by the Regional Board or the State Water Resources Control Board pursuant to the CWA and regulations adopted thereunder.

14. Taste or odor-producing substances to impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin or to cause nuisance or adversely affect beneficial uses.

15, The fecal coliform concentration in any 30-day period to exceed a geometric mean of 200 MPN/100 ml or cause more than 10 percent of total samples to exceed 400 MPN/100 ml.

C. Groundwater Limitations:

1. The discharge shall not cause the underlying groundwater to be degraded.

D. Provisions:

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

2. 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.

3. This permit, and the Monitoring and Reporting Program which is a part of this permit, requires that certain parameters be monitored on a continuous basis. The wastewater treatment plant is not staffed on a full time basis. Permit violations or system upsets can go undetected during this period. The Discharger is required to establish an electronic system for operator notification for continuous recording devise alarms. For existing continuous monitoring systems, the electronic notification system shall be installed within *six months* of adoption of this permit. For systems installed following permit adoption, the notification system shall be installed simultaneously.

4. The interim limitations in this Order are based on the current treatment plant performance and established at the maximum observed concentration. Interim limitations have been established since compliance with NTR and CTR based Effluent Limits cannot be achieved by the existing discharge. The Interim Limitations Limitations, B.2, establish enforceable concentration ceilings until compliance with the Effluent Limitations, B.3, can be achieved, which is required by **30 June 2008**.

5. The Discharger shall conduct the flow through toxicity testing specified in the Monitoring and Reporting Program. If the testing indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the water quality objective for toxicity, the Discharger initiate a Toxicity Identification Evaluation (TIE) to identify the causes of toxicity. Upon completion of the TIE, the Discharger shall submit a workplan to conduct a Toxicity Reduction Evaluation (TRE) and, after Regional Board evaluation, conduct the TRE. This Order will be reopened and a chronic toxicity limitation included and/or a limitation for the specific toxicant identified in the TRE included. Additionally, if a chronic toxicity water quality objective is adopted by the State Water Resources Control Board, this Order may be reopened and a limitation based on that objective included.

6. By **60 days after adoption** the Discharger shall complete and submit a compliance schedule justification for dibromochloromethane, dichlorobromomethane, bis(2-ethylhexyl) phthalate, cyanide, copper, mercury, lead, silver, zinc and thallium. The compliance schedule justification shall include all items specified by the SIP Section 2.1, Paragraph 3 (items (a) through (d)). Implementation of the new water quality based effluent limitations for mercury, cadmium, dibromochloromethane, dichlorobromomethane, bis(2-ethylhexyl) phthalate, cyanide, lead, copper, silver, zinc and thallium become effective on **first day of month following 60 days after adoption** if a compliance schedule justification meeting the requirements of Section 2.1 of the SIP is not completed and submitted by the Discharger. Otherwise the new final water quality based effluent limitations for dibromochloromethane, dichlorobromomethane, bis(2-ethylhexyl) phthalate, cyanide, copper, mercury, lead, silver, zinc and thallium required by this Order shall become effective on **30 June 2008**. As this schedule is greater than one year, the Discharger shall submit semi-annual progress reports on **15**

January and **15 July** each year until the Discharger achieves compliance with the final water quality based effluent limitations for dibromochloromethane, dichlorobromomethane, bis(2-ethylhexyl) phthalate, cyanide, lead, copper, mercury, silver, zinc and thallium .

7. The Discharger shall comply with the following time schedule to assure compliance with the limits for cadmium, dibromochloromethane, dichlorobromomethane, bis(2-ethylhexyl) phthalate, cyanide, copper, lead, mercury, silver, thallium, and zinc:

Task	Compliance Date	Report of Compliance Due
Submit Plan	30 December 2003	30 November 2003
Annual Report		30 January
Full Compliance	30 March 2008	30 March 2008

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

8. The Discharger shall report to the Regional Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986".

9. **Hydrogeologic Evaluation and Groundwater Monitoring Tasks**. If the Discharger uses its emergency ponds for the storage of untreated wastewater or any sludge, the Discharger shall complete a hydrogeologic investigation within the area affected and potentially affected by the WWTF and its discharge(s) to land. The technical report documenting the hydrogeologic investigation shall describe the underlying geology, existing wells (active and otherwise), local well construction practices and standards, well restrictions, hydrogeology and assess all impacts of the wastewater discharge on groundwater quality. The groundwater quality must be monitored at least quarterly for a minimum of four quarters for U.S. EPA priority pollutants, nutrients, coliform organisms, pH, TDS and EC. The technical report must present, for each monitoring event, determinations for the direction and gradient of groundwater flow.

10. The Discharger shall use the best practicable treatment or control technique currently available to limit mineralization to no more than a reasonable increment. The Discharger shall submit a plan to limit mineralization by **30 August 2005** for approval by the Executive Officer.

11. The Discharger shall comply with all the items of the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)", dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are referred to as "Standard Provisions."

12. The Discharger shall comply with Monitoring and Reporting Program No.R5-2003-0087, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

13. The Discharger must submit utilize EPA test methods and detection limits to achieve detection levels below applicable water quality criteria. At a minimum the Discharger shall comply with the Monitoring Requirements for these constituents as outlined in Section 2.3 and 2.4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California, adopted 2 March 2000 by the State Water Resources Control Board. All peaks identified by the EPA test methods shall be reported.

14. When requested by USEPA, the Discharger shall complete and submit Discharge Monitoring Reports. The submittal date shall be no later than the submittal date specified in the Monitoring and Reporting Program for Discharger Self Monitoring Reports.

15. This Order expires on **<*date*>** and the Discharger must file a Report of Waste Discharge in accordance with Title 23, CCR, not later than 180 days in advance of such date in application for renewal of waste discharge requirements if it wishes to continue the discharge.

16. By **30 March 2006**, the Discharger shall submit a *Sanitary Sewer System Operation, Maintenance, Overflow Prevention, and Response Plan* (SSS Plan) that describes the actions designed to prevent, or minimize the potential for sanitary sewer overflows. The Discharger shall maintain the SSS Plan in an up-to-date condition and shall amend the SSS Plan whenever there is a change (e.g. in the design, construction, operation, or maintenance of the sanitary sewer system or sewer facilities) that materially affects the potential for sanitary sewer overflows, or whenever there is a sanitary sewer overflow. The Discharger shall ensure that the up-to-date SSS Plan is readily available to sewer system personnel at all times and that sewer system personnel are familiar with it. A general order to regulate collection systems may be developed by the Regional Board. If a general order for collection systems is adopted by the Regional Board, the Discharger will be required to seek coverage under the general order. Once the Discharger has obtained a general order for the collection system, this permit may be reopened and these requirements may be removed from this permit.

    a. At a minimum, the Operation and Maintenance portion of the plan shall contain or describe the following:

    i. Detailed maps of the sanitary sewer system, identifying sewer mains, manholes, and lift stations;

    ii. A detailed listing of elements to be inspected, a description of inspection procedures and inspection frequency, and sample inspection forms;

    iii. A schedule for routine inspection and testing of all pipelines, lift stations, valves, and other key system components. The inspection/testing program shall be designed to reveal problems that might lead to accidental spills and ensure that preventive maintenance is completed;

iv. Provisions for repair or replacement of old, worn out, or defective equipment;

v. Provisions to minimize the need for manual operation of critical systems and provide spill alarms or other "fail safe" mechanisms;

vi. The ability to properly manage, operate and maintain, at all times, all parts of the collection system that the Discharger owns or over which the Discharger has operational control;

vii. The ability to provide adequate capacity to convey base flows and peak flows for all parts of the collection system the Discharger owns or over which the Discharger has operational control; and

viii. How the Discharger will take all feasible steps to stop and mitigate the impact of sanitary sewer overflows in portions of the collection system the Discharger owns or over which the Discharger has operational control.

b. At a minimum, the Overflow Prevention and Response Plan shall contain or describe the following:

i. Identification of areas of the collection system that historically have overflowed and an evaluation of the cause of the overflow;

ii. Maintenance activities that can be implemented to address the cause of the overflow and means to prevent future overflows. Maintenance activities may include pretreatment of wastewater from industrial dischargers who discharge high concentrations of oil and grease in their wastewater;

iii. Procedures for responding to sanitary sewer overflows designed to minimize the volume of sewer overflow that enters surface waters, and minimize the adverse effects of sewer overflows on water quality and beneficial uses;

iv. Steps to be taken when an overflow or spill occurs, and procedures that will be implemented to ensure that all overflows and spills are properly identified, responded to and reported; and

v. A public notification plan, in which any posting of areas contaminated with sewage is performed at the direction of the Yolo County Health Department. All parties with a reasonable potential for exposure to an overflow event shall be notified.

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

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

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

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

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

18. The Discharger shall implement its approved pretreatment program and the program shall be an enforceable condition of this permit. If the Discharger fails to perform the pretreatment functions, the Regional Board, the State Water Resources Control Board (SWRCB) or the U.S. EPA may take enforcement actions against the Discharger as authorized by the Clean Water Act.

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

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

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

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

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

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

f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

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

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

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

21. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office.

22. 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 Board and a statement. The statement shall comply with the signatory paragraph of Standard Provision D.6 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.

I, THOMAS R. PINKOS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 6 June 2003.

THOMAS R. PINKOS, Executive Officer

KCH:7/3/03)

U.S. EPA NATIONAL AMBIENT WATER QUALITY CRITERIA RECOMMENDED TO PROTECT FRESHWATER AQUATIC LIFE

TOTAL AMMONIA NITROGEN pH-DEPENDENT VALUES (ACUTE CRITERIA)

pH	Maximum Concentration 1-hour Average (mg N/l) *
6.5	32.6
6.6	31.3
6.7	29.8
6.8	28.0
6.9	26.2
7.0	24.1
7.1	21.9
7.2	19.7
7.3	17.5
7.4	15.3
7.5	13.3
7.6	11.4
7.7	9.64
7.8	8.11
7.9	6.77
8.0	5.62
8.1	4.64
8.2	3.83
8.3	3.15
8.4	2.59
8.5	2.14

* Criteria Maximum Concentration (CMC) with Salmonids Present

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

U.S. EPA NATIONAL AMBIENT WATER QUALITY CRITERIA RECOMMENDED TO PROTECT FRESHWATER AQUATIC LIFE TOTAL AMMONIA pH- AND TEMPERATURE-DEPENDENT VALUES (CHRONIC CRITERIA)

CCC* for Fish Early Life Stages Present, mg N/l										
pH	Temperature, ºC									
	0	14	16	18	20	22	24	26	28	30
6.5	6.67	6.67	6.06	5.33	4.68	4.12	3.62	3.18	2.80	2.46
6.6	6.57	6.57	5.97	5.25	4.61	4.05	3.56	3.13	2.75	2.42
6.7	6.44	6.44	5.86	5.15	4.52	3.98	3.50	3.07	2.70	2.37
6.8	6.29	6.29	5.72	5.03	4.42	3.89	3.42	3.00	2.64	2.32
6.9	6.12	6.12	5.56	4.89	4.30	3.78	3.32	2.92	2.57	2.25
7.0	5.91	5.91	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18
7.1	5.67	5.67	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	5.39	5.39	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	5.08	5.08	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	4.73	4.73	4.30	3.78	3.32	2.92	2.57	2.26	1.98	1.74
7.5	4.36	4.36	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	3.98	3.98	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	3.58	3.58	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	3.18	3.18	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	2.80	2.80	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	2.43	2.43	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	2.10	2.10	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.773
8.2	1.79	1.79	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	1.52	1.52	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562
8.4	1.29	1.29	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	1.09	1.09	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0.401
8.6	0.920	0.920	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	0.778	0.778	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	0.661	0.661	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	0.565	0.565	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0	0.486	0.486	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

* Criteria Continuous Concentration

U.S. EPA NATIONAL AMBIENT WATER QUALITY CRITERIA
RECOMMENDED TO PROTECT FRESHWATER AQUATIC LIFE
Hardness-Dependent Effluent Limitations for Cadmium
(expressed as total recoverable metal)

Hardness (mg/*l* as $CaCO_3$)	Average Monthly (µg/*l*)	CCC 4-Day Ave. (µg/*l*)	Max. Daily (µg/*l*)	*CMC* 1-Hour Ave. (µg/*l*)	Hardness (mg/*l* as $CaCO_3$)	Average Monthly (µg/*l*)	CCC 4-Day Ave. (µg/*l*)	Max. Daily (µg/*l*)	*CMC* 1-Hour Ave. (µg/*l*)
<25	*Calc.*	*Calc.*	*Calc.*	*Calc.*	180	3.2	3.9	6.4	8.8
25	0.47	0.83	0.94	0.95	190	3.3	4.1	6.7	9.3
30	0.58	0.96	1.2	1.2	200	3.5	4.2	7.0	9.9
35	0.69	1.1	1.4	1.4	210	3.6	4.4	7.2	10
40	0.80	1.2	1.6	1.6	220	3.7	4.6	7.5	11
45	0.91	1.3	1.8	1.8	230	3.9	4.7	7.8	12
50	1.0	1.4	2.1	2.1	240	4.0	4.9	8.0	12
55	1.1	1.5	2.3	2.3	250	4.1	5.1	8.3	13
60	1.3	1.6	2.5	2.5	260	4.3	5.2	8.5	13
65	1.4	1.8	2.8	2.8	270	4.4	5.4	8.8	14
70	1.5	1.9	3.0	3.0	280	4.5	5.5	9.1	14
75	1.6	2.0	3.2	3.3	290	4.6	5.7	9.3	15
80	1.7	2.1	3.4	3.5	300	4.8	5.8	9.6	16
85	1.8	2.2	3.6	3.8	310	4.9	6.0	9.8	16
90	1.9	2.3	3.7	4.0	320	5.0	6.1	10	17
95	1.9	2.4	3.9	4.3	330	5.1	6.3	10	17
100	2.0	2.5	4.0	4.5	340	5.3	6.4	11	18
110	2.2	2.7	4.3	5.0	350	5.4	6.6	11	19
120	2.3	2.8	4.7	5.5	360	5.5	6.7	11	19
130	2.5	3.0	5.0	6.1	370	5.6	6.9	11	20
140	2.6	3.2	5.3	6.6	380	5.7	7.0	12	20
150	2.8	3.4	5.5	7.1	390	5.9	7.2	12	21
160	2.9	3.6	5.8	7.7	400	6.0	7.3	12	22
170	3.1	3.7	6.1	8.2	>400	6.0	7.3	12	22

$$CCC = e^{\{0.7852[\ln(hardness)]-2.715\}}$$

$$CMC = e^{\{1.128[\ln(hardness)]-3.6867\}}$$

$$AMEL = 1.55[\min(0.321CMC, 0.527CCC)]$$

$$MDEL = 3.11[\min(0.321CMC, 0.527CCC)]$$

Where: AMEL = average monthly effluent limitation
MDEL = maximum daily effluent limitation
CCC = criteria continuous concentration
CMC = criteria maximum concentration

U.S. EPA NATIONAL AMBIENT WATER QUALITY CRITERIA
RECOMMENDED TO PROTECT FRESHWATER AQUATIC LIFE
Hardness-Dependent Effluent Limits for Copper
(expressed as total recoverable metal)

Hardness (mg/*l* as $CaCO_3$)	Average Monthly (µg/*l*)	CCC 4-Day Ave. (µg/*l*)	Max. Daily (µg/*l*)	Hardness (mg/*l* as $CaCO_3$)	Average Monthly (µg/*l*)	CCC 4-Day Ave. (µg/*l*)	Max. Daily (µg/*l*)
<25	*Calc.*	*Calc.*	*Calc.*	180	9.0	15	24
25	1.4	2.9	3.8	190	9.5	16	26
30	1.7	3.3	4.5	200	10	17	27
35	1.9	3.8	5.2	210	10	18	28
40	2.2	4.3	5.9	220	11	18	29
45	2.4	4.7	6.6	230	11	19	31
50	2.7	5.2	7.3	240	12	20	32
55	3.0	5.6	8.0	250	12	20	33
60	3.2	6.0	8.7	260	13	21	34
65	3.5	6.5	9.3	270	13	22	36
70	3.7	6.9	10	280	14	22	37
75	4.0	7.3	11	290	14	23	38
80	4.2	7.7	11	300	15	24	39
85	4.5	8.1	12	310	15	25	41
90	4.7	8.5	13	320	16	25	42
95	5.0	8.9	13	330	16	26	43
100	5.2	9.3	14	340	16	27	44
110	5.7	10	15	350	17	27	46
120	6.2	11	17	360	17	28	47
130	6.7	12	18	370	18	29	48
140	7.1	12	19	380	18	29	49
150	7.6	13	21	390	19	30	50
160	8.1	14	22	400	19	30	52
170	8.6	15	23	>400	19	30	52

$$CCC = e^{\{0.8545[\ln(hardness)]-1.702\}}$$

$$CMC = e^{\{0.9422[\ln(hardness)]-1.700\}}$$

$$AMEL = 2.13[\min(0.174CMC, 0.322CCC)]$$

$$MDEL = 5.74[\min(0.174CMC, 0.322CCC)]$$

Where: AMEL = average monthly effluent limitation
MDEL = maximum daily effluent limitation
CCC = criteria continuous concentration
CMC = criteria maximum concentration

Hardness used shall be lowest of effluent and receiving water results for samples collected same date.

U.S. EPA NATIONAL AMBIENT WATER QUALITY CRITERIA
RECOMMENDED TO PROTECT FRESHWATER AQUATIC LIFE
Hardness-Dependent Effluent Limitations for Lead
(expressed as total recoverable metal)

Hardness (mg/*l* as $CaCO_3$)	Average Monthly (µg/*l*)	CCC 4-Day Ave. (µg/*l*)	Max. Daily (µg/*l*)	*CMC* 1-Hour Ave. (µg/*l*)	Hardness (mg/*l* as $CaCO_3$)	Average Monthly (µg/*l*)	CCC 4-Day Ave. (µg/*l*)	Max. Daily (µg/*l*)	*CMC* 1-Hour Ave. (µg/*l*)
<25	*Calc.*	*Calc.*	*Calc.*	*Calc.*	180	5.5	6.7	11	170
25	0.45	0.54	0.89	14	190	5.9	7.2	12	180
30	0.56	0.69	1.1	18	200	6.3	7.7	13	200
35	0.68	0.84	1.4	21	210	6.7	8.2	13	210
40	0.81	0.99	1.6	25	220	7.1	8.7	14	220
45	0.94	1.2	1.9	30	230	7.5	9.2	15	240
50	1.1	1.3	2.2	34	240	7.9	9.7	16	250
55	1.2	1.5	2.4	38	250	8.3	10	17	260
60	1.4	1.7	2.7	43	260	8.8	11	18	280
65	1.5	1.8	3.0	47	270	9.2	11	18	290
70	1.7	2.0	3.3	52	280	9.6	12	19	300
75	1.8	2.2	3.6	57	290	10	12	20	320
80	2.0	2.4	3.9	61	300	11	13	21	330
85	2.1	2.6	4.2	66	310	11	13	22	340
90	2.3	2.8	4.6	71	320	11	14	23	360
95	2.4	3.0	4.9	76	330	12	15	24	370
100	2.6	3.2	5.2	82	340	12	15	25	390
110	2.9	3.6	5.9	92	350	13	16	26	400
120	3.3	4.0	6.6	100	360	13	16	27	420
130	3.6	4.4	7.3	110	370	14	17	28	430
140	4.0	4.9	8.0	130	380	14	17	29	450
150	4.4	5.3	8.7	140	390	15	18	29	460
160	4.7	5.8	9.5	150	400	15	19	30	480
170	5.1	6.3	10	160	>400	15	19	30	480

$$CCC = e^{\{1.273[\ln(hardness)]-4.705\}}$$

$$CMC = e^{\{1.273[\ln(hardness)]-1.460\}}$$

$$AMEL = 1.55[\min(0.321CMC, 0.527CCC)]$$

$$MDEL = 3.11[\min(0.321CMC, 0.527CCC)]$$

Where: AMEL = average monthly effluent limitation
MDEL = maximum daily effluent limitation
CCC = criteria continuous concentration
CMC = criteria maximum

Hardness-Dependent Effluent Limitations for Silver
Instantaneous Maximum
(expressed as total recoverable metal)

Hardness (mg/*l* as $CaCO_3$)	Instantaneous Maximum (µg/*l*)	Hardness (mg/*l* as $CaCO_3$)	Instantaneous Maximum (µg/*l*)
<25	*Calc.*	180	11
25	0.37	190	12
30	0.51	200	13
35	0.67	210	15
40	0.84	220	16
45	1.0	230	17
50	1.2	240	18
55	1.5	250	20
60	1.7	260	21
65	1.9	270	22
70	2.2	280	24
75	2.5	290	25
80	2.8	300	27
85	3.1	310	28
90	3.4	320	30
95	3.7	330	32
100	4.1	340	33
110	4.8	350	35
120	5.6	360	37
130	6.4	370	39
140	7.2	380	40
150	8.2	390	42
160	9.1	400	44
170	10	>400	44

Instantaneous Maximum = $e^{1.72[\ln(hardness)]-6.52}$

NATIONAL TOXICS RULE TO PROTECT FRESHWATER AQUATIC LIFE IN CALIFORNIA

Hardness-Dependent Effluent Limitations for Zinc

(expressed as total recoverable metal)

Hardness (mg/*l* as $CaCO_3$)	Average Monthly (µg/*l*)	CCC 4-Day Ave. (µg/*l*)	Max. Daily (µg/*l*)	Hardness (mg/*l* as $CaCO_3$)	Average Monthly (µg/*l*)	CCC 4-Day Ave. (µg/*l*)	Max. Daily (µg/*l*)
<25	*Calc.*	*Calc.*	*Calc.*	180	120	200	200
25	22	37	37	190	120	210	210
30	26	43	43	200	130	220	220
35	29	49	49	210	130	220	220
40	33	55	55	220	140	230	230
45	36	61	61	230	150	240	240
50	40	67	67	240	150	250	250
55	43	72	72	250	160	260	260
60	47	78	78	260	160	270	270
65	50	83	83	270	170	280	280
70	53	89	88	280	170	290	290
75	56	94	94	290	180	300	290
80	59	99	99	300	180	300	300
85	62	100	100	310	190	310	310
90	66	110	110	320	190	320	320
95	69	110	110	330	200	330	330
100	72	120	120	340	200	340	340
110	78	130	130	350	210	350	350
120	84	140	140	360	210	350	350
130	90	150	150	370	220	360	360
140	95	160	160	380	220	370	370
150	100	170	170	390	230	380	380
160	110	180	180	400	230	390	390
170	110	190	190	>400	230	390	390

$$CCC = e^{\{0.8473[\ln(hardness)]+0.884\}}$$

$$CMC = e^{\{0.8473[\ln(hardness)]+0.8845\}}$$

$$AMEL = 1.36[\min(0.440CMC, 0.643CCC)]$$

$$MDEL = 2.27[\min(0.440CMC, 0.643CCC)]$$

Where: AMEL = average monthly effluent limitation
MDEL = maximum daily effluent limitation
CCC = criteria continuous concentration
CMC = criteria maximum concentration

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2003-0087

NPDES NO. CA0079260

FOR

CITY OF WEST SACRAMENTO
WASTEWATER TREATMENT FACILITY
YOLO COUNTY

This Monitoring and Reporting Program is issued pursuant to California Water Code Sections 13383 and 13267. The Discharger shall not implement any changes to this Program unless and until the Regional Board or Executive Officer issues a revised Monitoring and Reporting Program. Specific sample station locations shall be established under direction of the Regional Board's staff, and a description of the stations shall be attached to this Order.

INFLUENT MONITORING

Samples shall be collected at approximately the same time as effluent samples and should be representative of the influent for the period sampled. Influent monitoring shall include at least the following:

Constituents	Units	Type of Sample	Sampling Frequency
20°C BOD_5	mg/*l*, lbs/day	24-hr. Composite[1]	3 Times Weekly
Total Suspended Solids	mg/*l*, lbs/day	24-hr. Composite[1]	3 Times Weekly
pH	Number	Meter	Continuous
Ammonia, Total (as N)	mg/*l*	Grab	4 Times Weekly
Priority Pollutants	µg/*l*	As Appropriate[2]	Twice Annually
Flow	mgd	Meter	Continuous
Hardness	mg/l	Grab	Monthly
Electrical Conductivity @25°C	µmhos/cm	Grab	5 Times Weekly

[1] The BOD and TSS samples shall be flow-proportional composite samples collected on the same day as the effluent samples.

[2] Volatile samples shall be grab samples, the remainder shall be flow-proportional 24-hour composite samples.

EFFLUENT MONITORING OF DISCHARGE TO OUTFALLS 001 AND 002

Effluent samples shall be collected downstream from the last connection through which wastes can be admitted into the outfall, following the last unit process. Effluent samples should be representative of the volume and quality of the discharge. Time of collection of samples shall be recorded.

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

Constituents	Units	Type of Sample	Sampling Frequency
Flow	mgd	Meter	Continuous
Total Residual Chlorine	mg/*l*, lbs/day	Meter	Continuous
Temperature[3]	°F	Grab	Daily
Total Coliform Organisms[4]	MPN/l00 m*l*	Grab	5 Times Weekly
pH[3]	Number	Meter	Continuous
Ammonia (as N)[5, 6, 7,8]	mg/*l*, lbs/day	Grab	4 Times Weekly
20°C BOD_5	mg/*l*, lbs/day	24-hr Composite[9]	4 Times Weekly
Total Suspended Solids	mg/*l*, lbs/day	24-hr Composite[9]	4 Times Weekly
Settleable Solids	m*l*/*l*	24-hr Composite[9]	5 Times Weekly
Electrical Conductivity @ 25°C	µmhos/cm	Grab	5 Times Weekly
Oil and Grease	mg/l	Grab	2 times per month
Nitrite[10]	mg/*l*, lbs/day	Grab	Monthly

[3] A hand-held field meter may be used, provided the meter utilizes a U.S. EPA-approved algorithm/method and is calibrated and maintained in accordance with the manufacturer's instructions. A calibration and maintenance log for each meter used for monitoring required by this Monitoring and Reporting Program shall be maintained at the WWTF.
[4] Total coliform organisms samples may be collected at any point following disinfection, provided that samples are dechlorinated at the time of collection. The Discharger shall report the sampling location(s) in the monthly self-monitoring reports.
[5] Report as total ammonia.
[6] Concurrent with biotoxicity monitoring.
[7] In reporting lbs/day, the Discharger shall report both the lbs/day discharged and the calculated lbs/day limitation.
[8] Temperature and pH shall be recorded at the time of ammonia sample collection.
[9] These samples shall be flow-proportional composite samples.
[10] Monitoring for nitrite and nitrate shall be conducted concurrently.

Constituents	Units	Type of Sample	Sampling Frequency
Nitrate[10]	mg/*l*, lbs/day	Grab	Monthly
Hardness (as $CaCO_3$)	mg/*l*	Grab	Monthly
Total Dissolved Solids	mg/*l*, lbs/day	Grab	Monthly
Aluminum[7]	µg/l, lbs/day	24-hr Composite[9]	Monthly
Chloromethane	µg/l, lbs/day	Grab	Monthly
Bis (2-ethylhexyl) phthalate	µg/l, lbs/day	24-hr Composite[9]	Monthly
Cadmium[7]	µg/l, lbs/day	24-hr Composite[9]	Monthly
Chloroform	µg/l, lbs/day	Grab	Monthly
Copper[7]	µg/l, lbs/day	24-hr Composite[9]	Monthly
Cyanide	µg/l, lbs/day	24-hr Composite[9]	Monthly
Dalapon	µg/l, lbs/day	24-hr Composite[9]	Monthly
1,4-Dichlorobenzene	µg/l, lbs/day	Grab	Monthly
Dibromochloromethane	µg/l, lbs/day	Grab	Monthly
Dichlorobromomethane	µg/l, lbs/day	Grab	Monthly
Thallium	µg/l, lbs/day	24-hr Composite[9]	Monthly
Iron	µg/l, lbs/day	24-hr Composite[9]	Monthly
Manganese	µg/l, lbs/day	24-hr Composite[9]	Monthly
Lead	µg/l, lbs/day	24-hr Composite[9]	Monthly
Silver	µg/l, lbs/day	24-hr Composite[9]	Monthly
Mercury	µg/l, lbs/day	24-hr Composite[9]	Monthly
Zinc	µg/l, lbs/day	24-hr Composite[9]	Monthly
MTBE	µg/l, lbs/day	Grab	Monthly
Organochlorine Pesticides	µg/l, lbs/day	24-hr Composite[9]	Monthly
Priority Pollutants[11,12]	mg/*l*	As Appropriate[13]	Twice Annually[14]
Acute Toxicity[15]	% survival	Flow Through	2XMonthly

[11] All peaks are to be reported, along with any explanation provided by the laboratory.
[12] Priority Pollutants is defined as U.S. EPA priority toxic pollutants and consists of the constituents listed in the most recent National Toxics Rule and California Toxics Rule.
[13] Volatile samples shall be grab samples; the remainder shall be 24-hour composite samples.
[14] Hardness, pH, and temperature data shall be collected at the same time and date as the Priority Pollutant samples.
[15] The flow through bioassay shall be 96-hour continuous flow acute toxicity tests conducted in accordance with EPA method EPA/821-R-02-012, or later amendment approved by Board staff. The Bioassay shall sample undiluted effluent after the dechlorination

RECEIVING WATER MONITORING

All receiving water samples shall be grab samples. Receiving water monitoring shall include at least the following:

Station	Description
R-1	100 feet upstream from the point of discharge (001)
R-2	200 feet downstream from the point of discharge (001)
R-3	100 feet upstream from the point of discharge (002)
R-4	200 feet downstream from the point of discharge (002)

Constituents	Units	Station	Sampling Frequency
Dissolved Oxygen[16]	mg/*l*[17]	R-l, R-2, R-3, R-4	Monthly
	% saturation[18]		
pH[16]	Number	R-l, R-2, R-3, R-4	Monthly
Turbidity	NTU	R-l, R-2R-3, R-4	Monthly
Temperature[16]	°F (°C)	R-l, R-2, R-3, R-4	Monthly
Electrical Conductivity @25°C[16]	µmhos/cm	R-l, R-2, R-3, R-4	Monthly
Hardness	Mg/l	R-l, R-2, R-3, R-4	Monthly
Fecal Coliform Organisms	MPN/100 m*l*	R-l, R-2, R-3, R-4	Quarterly
Radionuclides	pCi/*l*[19]	R-l, R-2, R-3, R-4	Annually

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by Stations R-l, R-2, R-3 and R-4. Attention shall be given to the presence or absence of:

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

Notes on receiving water conditions shall be summarized in the monitoring report. R-3 and R-4 sampling shall only be required during months when there is a discharge from outfall 002.

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process and prior to discharge to the Sacramento River. Juvenile rainbow trout (Oncorhynchus mykiss) shall be used as the test species. If rainbow trout are unavailable, juvenile fathead minnows (Pimephales promelas) may be used for limited periods. The flow through bioassay shall be started on different days to assure representative sampling of the waste stream.

[16] A hand-held field meter may be used, provided the meter utilizes a U.S. EPA-approved algorithm/method and is calibrated and maintained in accordance with the manufacturer's instructions. A calibration and maintenance log for each meter used for monitoring required by this Monitoring and Reporting Program shall be maintained at the WWTF.

[17] Temperature shall be determined at the time of sample collection for use in determining saturation concentration. Any additional factors or parameters used in determining saturation concentration shall also be reported.

[18] Report both percent saturation and saturation concentration.

[19] pCi/*l* = picocuries per liter

SLUDGE MONITORING

A composite sample of sludge shall be collected annually in accordance with U.S. EPA's POTW Sludge Sampling and Analysis Guidance Document, August 1989, and tested for the metals listed in Title 22.

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

The Discharger shall submit an annual characterization of sludge quality, including sludge percent solids and quantitative results of chemical analysis for the priority pollutants listed in 40 CFR 122 Appendix D, Tables II and III (excluding total phenols). Suggested methods for analysis of sludge are provided in U.S. EPA 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 in U.S. EPA's POTW Sludge Sampling and Analysis Guidance Document, August 1989.

WATER SUPPLY MONITORING

A sampling station shall be established where a representative sample of the municipal water supply can be obtained. Water supply monitoring shall include at least the following:

Constituents	Units	Sampling Frequency
Electrical Conductivity @ 25°C	µmhos/cm	Annually
Total Dissolved Solids	mg/*l*	Annually

If the water supply is from more than one source, the monitoring report shall report the electrical conductivity and total dissolved solids results as a weighted average and include copies of supporting calculations.

REPORTING

Discharger self-monitoring results shall be submitted to the Regional Board monthly. Monitoring results shall be submitted by the **first day of the second month** following sample collection. Quarterly, semi-annual, and annual monitoring results shall be submitted by the **first day of the second month following each calendar quarter**.

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the reported analytical result are readily discernible. The data shall be summarized in such a manner to clearly illustrate whether the discharge complies with waste discharge requirements. Monthly maximums, minimums, and averages shall be reported for each monitored

constituent and parameter. Removal efficiencies (%) for biochemical oxygen demand and total suspended solids and all periodic averages and medians for which there are limitations shall also be calculated and reported.
The Discharger shall report minimum levels and method detection limits as defined in and required by the SIP.

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

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

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

By **1 February** 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 WWTF (Standard Provision A.5).

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 and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration (Standard Provision C.6).

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.

The Discharger may also be requested to submit an annual report to the Regional 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.

All reports submitted in response to this Order shall comply with the signatory requirements of Standard Provision D.6.

The Discharger shall implement the above monitoring program on the first day of the month following effective date of this Order.

Ordered by: _____
THOMAS R. PINKOS, Executive Officer

_____
(Date)

FACT SHEET

ORDER NO. R5-2003-0087
CITY OF WEST SACRAMENTO
WASTEWATER TREATMENT FACILITY
YOLO COUNTY
NPDES NO. CA0079171

SCOPE OF PERMIT

This renewed Order regulates the discharge of up to 7.5 million gallons per day (mgd), design average dry weather flow (ADWF), of effluent from the West Sacramento Wastewater Treatment Facility (WWTF). This Order includes effluent, groundwater, water supply, sludge, and surface water limitations, monitoring and reporting requirements, additional study requirements, and reopener provisions for effluent and groundwater constituents.

BACKGROUND INFORMATION

The treatment system consists of a septage receiving station, a bar screen, primary clarifiers, aeration basin (activated sludge with anoxic selector), secondary clarifiers and chlorination/dechlorination. The aeration basins are operated to nitrify and denitrify, reducing both the ammonia and nitrate concentrations in the wastewater. Sludge is thickened by a gravity thickener prior to anaerobic digestion. The digested sludge is dewatered with belt filter presses then hauled off-site by Synagro, a private contractor. Screenings and debris are hauled off-site by Waste Management, Inc. a private contractor. There are emergency ponds located at the WWTP site.

The Discharger is planning to expand its service area and grow within its City limits. To accommodate this growth, the Discharger chose to abandon the existing WWTP and sent its wastewater to the Sacramento Regional County Sanitation District (SRCSD) wastewater treatment plant located near Freeport. The Discharger has an agreement with SRCSD to treat and dispose the Discharger's wastewater. The wastewater interceptor to connect the Discharger with the SRCSD treatment plant will be completed by 2007.

RECEIVING WATER BENEFICIAL USES AND ASSIMILATIVE CAPACITY

The beneficial uses of the Sacramento River and Sacramento/San Joaquin Delta downstream of the discharge as identified in Table II-1 of the Basin Plan are municipal and domestic supply, agricultural irrigation, agricultural stock watering, industrial process water supply, industrial service supply, body contact water recreation, other non-body contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat, wildlife habitat, and navigation.

EFFLUENT LIMITATIONS AND REASONABLE POTENTIAL

Effluent limitations, and toxic and pretreatment effluent standards established pursuant to Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and

Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act (CWA) and amendments thereto are applicable to the discharge.

Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs the Regional Board finds that the discharge does have a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for trihalomethanes, chloromethane, dibromochloromethane, dichlorobromomethane, methyl-tert-butyl ether (MTBE), bis(2-ethylhexyl) phthalate, aluminum, cadmium, copper, cyanide, iron, mercury, manganese, thallium, lead, silver, zinc, Aldrin, Heptachlor, Lindane, Dalapon, ammonia, chloride, nitrate, and nitrite.

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 Sacramento Delta Waterways are listed as a WQLS for mercury, DDT, Chlordane, toxicity, copper, cadmium, lead and toxaphene. The Sacramento Delta is listed in the 303(d) list of impaired water bodies for diazinon, Group A pesticides, mercury, DDT, Chlorpyrifos, electrical conductivity and unknown toxicity. Therefore, the receiving water for the discharge has no assimilative capacity for these constituents and applicable water quality standards must be applied as end-of-pipe effluent limitations if any of these constituents have been detected in the effluent or receiving stream. Mercury and Group A pesticides were detected in the effluent based on the information submitted by the Discharger. The Sacramento Regional County Sanitation District detected lead in the Sacramento River at levels above the CTR criteria and there no assimilative capacity if available for lead in the effluent. Effluent Limitations for those constituents that were detected are included in this Order.

a. **Mercury**— Municipal and domestic supply is a beneficial use of the Sacramento River. The current U.S. EPA Ambient Water Quality Criteria for Protection of Freshwater Aquatic Life, continuous concentration, for mercury is 0.77 µg/*l* (30-day average, chronic criteria). The CTR contains a human health criterion (based on a one-in-a-million cancer risk) of 0.050 µg/*l* for waters from which both water and aquatic organisms are consumed. In 40 CFR Part 131, U.S. EPA acknowledges that the human health criteria may not be protective of some aquatic or endangered species. Both values are controversial and subject to change. In the CTR, U.S. EPA reserved the mercury criteria for freshwater and aquatic life and may adopt new criteria at a later date. The maximum observed effluent mercury concentration was 0.00226 µg/*l*. The Sacramento Delta has been listed as an impaired water body pursuant to Section 303(d) of the Clean Water Act because of mercury. Because the Sacramento Delta has been listed as an impaired water body for mercury, the discharge must not cause or contribute to increased mercury levels. The SIP, Section 1.3, requires the establishment of an effluent limitation for a constituent when the receiving stream background water quality

exceeds an applicable criterion or objective. This Order contains Effluent Limitations for mercury based on the CTR human health criterion of 0.050 µg/*l*. This Order also contains a performance-based mass Effluent Limitation of 0.35 lbs/twelve months for mercury for the effluent discharge to the Sacramento River. This limitation is based on maintaining the mercury loading at the current level until a total maximum daily load (TMDL) can be established and U.S. EPA develops mercury standards or criteria that are protective of human health and freshwater aquatic life. The mass limitation was derived using the maximum observed effluent mercury concentration (0.00226 µg/*l*) and the reported average daily effluent flow rate (5.08 mgd). Compliance time schedules have not been included since the discharge currently meets the concentration based limitation and the mass limitation can be met through source control measures and/or by limiting new sewer discharges containing mercury concentrations. If U.S. EPA develops new water quality standards or criteria for mercury, this permit may be reopened and the Effluent Limitations adjusted.

b. **Group A Pesticides (Organochlorine Pesticides)**—Based on information included in analytical laboratory reports submitted by the Discharger, lindane (gamma BHC), aldrin and heptachlor, organochlorine pesticides, in the discharge have a reasonable potential to cause or contribute to an in-stream excursion above CTR standards for these individual constituents. However, the Basin Plan requires that: no individual pesticides shall be present in concentrations that adversely affect beneficial uses; discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses; total chlorinated hydrocarbon pesticides shall not be present in the water column at detectable concentrations; and pesticide concentrations shall not exceed those allowable by applicable antidegradation policies. The detection of lindane, aldrin and heptachlor in the WWTF effluent presents a reasonable potential to exceed the Basin Plan limitations for organochlorine pesticides. In addition to lindane (gamma BHC), aldrin, and heptachlor, the organochlorine pesticides include alpha BHC, beta BHC, delta BHC, DDD, DDE, DDT, chlordane, dieldrin, endrin and endrin aldehyde, alpha and beta endosulfan and endosulfan sulfate, and heptachlor epoxide, and toxaphene. Effluent Limitations for organochlorine pesticides at nondetectable concentrations are included in this Order and are based on Basin Plan objectives.

c. **Lead** - Lead is a heavy metal and was detected in the Sacramento River as high as 1.5 µg/l in December 2001 by the Sacramento Regional County Sanitation District. Therefore, there is no assimilative capacity for lead in the receiving stream. Lead toxicity is hardness dependent. The CTR criteria for lead is 0.57 µg/l for the 4-day chronic limit and 15 µg/*l* for the 1-hour acute limit at the worst-case scenario of 26 mg/l hardness in the Sacramento River. Effluent limits for lead are included in this Order based on the CTR, and are presented in total concentration.

The U.S. EPA Technical Support Document for Water Quality-based Toxics Control recommends converting acute (one-hour average) and chronic (four-day average) aquatic life criteria to maximum daily and average monthly effluent limitations. Conversions are demonstrated in the following equations:

$$LTA_{ac} = WLA_{ac} \times \exp\left(0.5\sigma^2 - z\sigma\right)$$
$$LTA_c = WLA_c \times \exp\left(0.5\sigma_4{}^2 - z\sigma_4\right)$$
$$LTA = \min\left(LTA_C, LTA_{ac}\right)$$
$$AMEL = LTA \times \exp\left(z\sigma_n - 0.5\sigma_n{}^2\right)$$
$$MDEL = LTA \times \exp\left(z\sigma - 0.5\sigma^2\right)$$

where

LTA_{ac} = Acute long-term average wasteload in chronic units
LTA_c = Chronic long-term average wasteload
WLA_{ac} = Acute wasteload allocation in chronic toxic units
LTA = Long-term average
σ = Standard deviation
AMEL = Average monthly effluent limitation
MDEL = Maximum daily effluent limitation

Using above equations with a coefficient of 0.6 (since 80% or more of the samples were non-detect), maximum daily and average monthly concentration-based Effluent Limitations for lead are shown in Attachment F.

Aluminum- Aluminum can be toxic to aquatic organisms. Based on information included in analytical laboratory reports submitted by the Discharger, the discharge contained concentrations of aluminum as high as 230 µg/l. The U. S. EPA National Recommended Ambient Water Quality Criteria for protection of freshwater aquatic life for aluminum are 87 µg/l for the acute limit and 750 µg/l for the chronic limit. In addition, the Chemical Constituents Objective also prohibits chemical constituents in excess of California Maximum Contaminant Levels (MCLs) for waters designated MUN. An effluent limitation, based on preventing toxicity has been included in this permit.

Ammonia, Nitrite, and Nitrate— Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrate. Wastewater treatment plants commonly use nitrification to remove ammonia from the waste stream. Inadequate or incomplete nitrification may result in the discharge of ammonia to the receiving stream. Ammonia is known to cause toxicity to aquatic organisms in surface waters. U. S. EPA has developed Ambient Water Quality Criteria for the protection of freshwater aquatic life for ammonia. . U.S. EPA has published tables for pH and temperature-dependent Ambient Water Quality Criteria for ammonia criteria. The pH and temperature of the Sacramento River should be used for determining the chronic (monthly) limit. The effluent pH should be used for determining the acute (1-hour) limit for ammonia. Effluent limitations for ammonia are included in this Order to assure the treatment process adequately nitrifies the water stream to protect the beneficial uses of the receiving stream and to prevent aquatic toxicity.

In water, un-ionized ammonia (NH_3) exists in equilibrium with the ammonium ion (NH_4^+). The toxicity of aqueous ammonia solutions to aquatic organisms is primarily attributable to the un-ionized ammonia form, with the ammonium ion being relatively less toxic. The relative concentrations of these two forms are pH and temperature-dependent. Total ammonia refers to the sum of these two forms in aqueous solutions.

The Basin Plan includes a water quality objective that "*[a]ll water shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life*". U.S. EPA's Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life, for total ammonia, recommends acute (1-hour average) standards based on pH and chronic (30-day average) standards based on pH and temperature. It also recommends a maximum four-day average concentration. U.S. EPA 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 receiving stream has a beneficial use of cold freshwater habitat, the recommended criteria for waters where salmonids are present were used.

U.S. EPA has presented the acute ammonia criteria in three ways: as equations, in a table, and in graphs that relate pH to ammonia concentrations. Attachment B shows the equation and table used for the 30-day average concentration criteria recommended for waters where fish early life stages are present. Attachment C shows the equation and table used for the 4-day average concentration criteria recommended for waters where fish early life stages are present. Attachment D shows the equation and table used for the 1-hour average concentration criteria recommended for waters where salmonid fish are present. A 30-day period is a reasonable representation of a calendar month; so, to conform to 40 CFR §122.45, the 30-day average criteria are set equal to average monthly limitations in Order No. R5-2003-0087.

For waters designated as having the beneficial use of municipal and domestic supply (MUN), the Basin Plan includes a water quality objective that water "*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 64431-A (Inorganic Chemicals)…*". U.S. EPA has developed a primary MCL and an MCL goal of 1,000 µg/*l* for nitrite (as nitrogen). The primary MCL listed in Title 22 of the California Code of Regulations (CCR), Table 64431-A, is also 1,000 µg/*l* for nitrite as nitrogen. For nitrate, U.S. EPA has developed Drinking Water Standards (10,000 µg/*l* as Primary Maximum Contaminant Level) and Ambient Water Quality Criteria for protection of human health (10,000 µg/*l* for non-cancer health effects). Title 22 CCR, Table 64431-A, also includes a primary MCL of 10,000 µg/*l* for the sum of nitrate and nitrite, measured as nitrogen. Recent toxicity studies have indicated a possibility that nitrate is toxic to aquatic organisms.

The conversion of ammonia to nitrites and the conversion of nitrites to nitrates present a reasonable potential for the discharge to exceed the primary maximum contaminant levels for nitrite and the sum of nitrite and nitrate. Therefore, Order No. R5-2003-0087 includes limitations for nitrite and the sum of nitrite and nitrate.

BOD and TSS—40 Code of Federal Regulations (CFR), Section 133.102 contains regulations describing the minimum level of effluent quality—for biochemical oxygen demand (BOD) and total suspended solids (TSS)—attainable by secondary treatment. These standards continue to be applied in Order No. R5-2003-0087.

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.

Order No. R5-2003-0087 contains a limitation requiring an average of 85 percent removal of BOD and TSS over each calendar month.

Bis(2-ethylhexyl) phthalate- The CTR includes a criterion for the protection of human health based on a one-in-a-million cancer risk for bis(2-ethylhexyl) phthalate of 1.8 µg/*l*. In addition, the California primary MCL for bis(2-ethylhexyl) phthalate is 4 µg/l. Municipal and domestic supply is a beneficial use of the receiving water. The maximum observed effluent bis(2-ethylhexyl) phthalate concentration was 66 µg/*l*. Effluent Limitations for bis(2-ethylhexyl) phthalate are included in this Order.

Cadmium— The CTR includes hardness-dependent criteria for cadmium. The criteria for cadmium and several other metals are presented in dissolved concentrations. U.S. EPA recommends conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for cadmium in freshwater are 1.101672-[0.041838 X ln(hardness)] for the chronic criteria and 1.136672-0.041838 X ln(hardness)] for the acute criteria. Using the worst-case lowest hardness of the Sacramento River measured by SRCSD is 26 mg/l, the corresponding total recoverable concentration criteria standards are 0.99 µg/*l* and 0.85 µg/*l* for the acute and chronic criteria, respectively. The maximum observed effluent cadmium concentration was 4.0 µg/*l*. The Effluent Limitations for cadmium included in this Order.

The U.S. EPA Technical Support Document for Water Quality-based Toxics Control recommends converting acute (one-hour average) and chronic (four-day average) aquatic life criteria to maximum daily and average monthly effluent limitations. Conversions are demonstrated in the following equations:

$$LTA_{ac} = WLA_{ac} \times \exp\left(0.5\sigma^2 - z\sigma\right)$$
$$LTA_c = WLA_c \times \exp\left(0.5\sigma_4{}^2 - z\sigma_4\right)$$
$$LTA = \min\left(LTA_C, LTA_{ac}\right)$$
$$AMEL = LTA \times \exp\left(z\sigma_n - 0.5\sigma_n{}^2\right)$$
$$MDEL = LTA \times \exp\left(z\sigma - 0.5\sigma^2\right)$$

where

LTA_{ac} = Acute long-term average wasteload in chronic units
LTA_c = Chronic long-term average wasteload
WLA_{ac} = Acute wasteload allocation in chronic toxic units
LTA = Long-term average
σ = Standard deviation
AMEL = Average monthly effluent limitation
MDEL = Maximum daily effluent limitation

Using above equations with a coefficient of 0.6 (since 80% or more of the samples were non-detect), maximum daily and average monthly concentration-based Effluent Limitations for cadmium are shown in Attachment D.

Chlorine-The Basin Plan prohibits the discharge of toxic materials in toxic concentrations. The Discharger uses chlorine for disinfection of the effluent waste stream. Chlorine can cause toxicity to

aquatic organisms when discharged to surface waters. U. S. EPA recommends, in its Ambient Water Quality Criteria for the Protection of Fresh Water Aquatic Life, that chlorine concentrations not exceed 0.02 mg/l as a 1-hour average and 0.01 mg/l as a 4-day average. The use of chlorine as a disinfectant presents a reasonable potential that it could be discharged in toxic concentrations. An Effluent Limitation for chlorine has been included in this Order to protect the receiving stream aquatic life beneficial uses.

Chlorine is commonly used as a disinfection agent in the treatment of wastewater. The Discharger uses chlorine for disinfection at its WWTP. For dechlorination, the Discharger uses sulfur dioxide, which combines with chlorine, to render it relatively unreactive and thus remove it from the waste stream. Inadequate dechlorination may result in discharge of chlorine to the receiving stream and cause toxicity. For chlorine, U. S. EPA has developed Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life. The maximum concentration for chlorine is 0.019 mg/l and the chronic (4-day) average is 0.011 mg/l. Rounded off, the limits are 0.02 mg/l and 0.01 mg/l. Concentration-based effluent limitations for chlorine, based on these criteria, are included in the permit. The mass-based effluent limitations, are calculated using the Ambient Water Quality Criteria and multiplying by the average dry weather design flow (7.5 mgd) and a factor of 8.345 to convert to lbs/day.

Chloroform - The Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA) has published 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 Cal/EPA. The OEHHA cancer potency value for oral exposure to chloroform is 0.031 milligrams per kilogram body weight per day (mg/kg-day). By applying standard toxicologic assumptions used by OEHHA and USEPA in evaluating health risks via drinking water exposure of 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. This risk level is consistent with that used by the Department of Health Services (DHS) to set *de minimis* risks from involuntary exposure to carcinogens in drinking water in developing MCLs and Action Levels and by OEHHA to set negligible cancer risks in developing Public Health Goals for drinking water. The one-in-a-million cancer risk level is also mandated by USEPA in applying human health protective criteria contained in the National Toxics Rule and the California Toxics Rule to priority toxic pollutants in California surface waters. Based on information included in analytical laboratory results submitted by the Discharger, the discharge was found to have an average concentration of 19.9 µg/l, with a maximum concentration of 44 µg/l of chloroform. Therefore, an Effluent Limitation for chloroform is included in this Order.

Chloromethane- Based on information submitted by the Discharger the discharge has reasonable potential to cause or contribute to an in stream excursion above the USEPA Drinking Water Health Advisory for chloromethane of 3.0 µg/l. On 21 September 1999 the sampling results showed a concentration of chloromethane at 3.9 µg/l. Therefore, an Effluent Limitation for chloromethane is included in this Order.

Copper-The CTR standards for metals are presented in dissolved concentrations. U.S. EPA recommends conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for copper in freshwater are 0.960 for both the acute and the chronic criteria. Using

the worst-case, lowest of hardness of the Sacramento River measured by SRCSD is 26 mg/l, the corresponding standards for total copper are 3.9 µg/*l* and 3.0 µg/*l* for the acute and chronic criteria, respectively. The maximum observed effluent copper concentration was 13.0 µg/l. The effluent limitations for copper are presented in total recoverable concentrations, and included in this Order. The U.S. EPA Technical Support Document for Water Quality-based Toxics Control recommends converting acute (one-hour average) and chronic (four-day average) aquatic life criteria to maximum daily and average monthly effluent limitations. Conversions are demonstrated in the following equations:

$$LTA_{ac} = WLA_{ac} \times \exp\left(0.5\sigma^2 - z\sigma\right)$$
$$LTA_c = WLA_c \times \exp\left(0.5\sigma_4{}^2 - z\sigma_4\right)$$
$$LTA = \min\left(LTA_C, LTA_{ac}\right)$$
$$AMEL = LTA \times \exp\left(z\sigma_n - 0.5\sigma_n{}^2\right)$$
$$MDEL = LTA \times \exp\left(z\sigma - 0.5\sigma^2\right)$$

where

LTA_{ac} = Acute long-term average wasteload in chronic units
LTA_c = Chronic long-term average wasteload
WLA_{ac} = Acute wasteload allocation in chronic toxic units
LTA = Long-term average
σ = Standard deviation
AMEL = Average monthly effluent limitation
MDEL = Maximum daily effluent limitation

Using above equations with a coefficient of 1.2, maximum daily and average monthly concentration-based Effluent Limitations for copper are shown in Attachment E.

Cyanide- Cyanide was detected in an effluent sample collected 25 June 1999 at a concentration of 16 µg/l. The CTR continuous concentration (four-day average concentration) is 5.2 µg/l and the recommended maximum concentration (one-hour average concentration) is 22 µg/l. Effluent limitations for cyanide are included in this Order.

The State Board adopted the SIP on 2 March 2000 and amended it on 26 April 2000. The SIP includes methodology for establishing effluent limitations for priority toxic pollutants included in the NTR and CTR. The SIP includes the following equation for calculating the maximum daily effluent limitation (MDEL) when the applicable criteria are for the protection of human health:

$$MDEL_{hh} = ECA * \left(\frac{MDEL}{AMEL}\right)_{multiplier}$$

where

ECA = Effluent concentration allowance
ECA = Average monthly effluent limitation (for the protection of human health)
AMEL = Average monthly effluent limitation
$MDEL_{hh}$ = Maximum daily effluent limitation (for the protection of human health)

Using the equation above and a coefficient of 0.6 (since more than 80% of the samples were non-detect), the maximum daily concentration-based Effluent Limitation for cynanide is calculated at 8.52 µg/l and the average monthly Effluent Limitation is calculated as 4.25 µg/l.

Dalapon- Dalapon can be toxic to aquatic organisms. Based on information included in analytical laboratory reports submitted by the Discharger, the discharge contained concentrations of Dalapon at 26 µg/l. The U. S. EPA National Recommended Ambient Water Quality Criteria for protection or freshwater aquatic life for Dalapon is 110 µg/l. Additionally, the California primary MCL for Dalapon is 200 µg/l. Although the effluent concentration is lower than the Ambient Water Quality Criteria, a statistical analysis shows the discharge has a reasonable potential to cause violation of the Basin Plan prohibition against the discharge of toxic constituents for dalapon. An effluent limitation has been included in this permit.

Dalapon– Reasonable Potential Analysis

Y	F	fY	$y = Y - \overline{Y}$	y^2	fy^2
26 Nd*					
Totals	$\sum f = 2$	$\sum fY =$			$\sum fy^2 =$

Dalapon Concentration (µg/l) = Y =
Frequency = $f = 2$
Number of Samples = $n = \sum f$ =
Mean = $\overline{Y} = \frac{\sum fY}{n}$ =
Variance = $S^2 = \frac{\sum fy^2}{n}$ =
Standard Deviation = $S = \sqrt{S^2} = \sqrt{\quad}$
Coefficient of Variation = $C_V = \frac{S}{\overline{Y}}$ =

@ C_V = 0.6 and n =2 , with a 99% Confidence Limit → Multiplication Factor ≈ 7.4
→ 26 µg/l x 7.4 = 192 µg/l
Ambient Water Quality criteria = 110 µg/l , therefore reasonable potential
*Coefficient of Variation = 0.6 if more than 80% of the samples are non detect; 0.6 if less than 10 samples; if nd < 80% samples, then nd = CQL
* Multiplication Factor from Table 3-1, page 54, of U.S. EPA *Technical Support Document For Water Quality-based Toxics Control*.

1,4-Dichlorobenzene - Based on information submitted by the Discharger the discharge has reasonable potential to cause or contribute to an in stream excursion above the California Drinking Water Standards Primary MCL for 1,4-dichlorobenzene. The Primary MCL for 1,4-dichlorobenzene is 5.0 µg/l. On 23 September 2002 the sampling results showed a concentration of chloromethane at 5.0 µg/l. Based on information included in analytical laboratory results submitted by the Discharger, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the water quality standard for 1,4-dichlorobenzene. Therefore, an Effluent Limitation for 1,4-dichlorobenzene is included in this Order and is based on protecting the receiving water municipal beneficial use.

Dibromochloromethane- The criteria for waters from which both water and organisms are consumed is 0.41 µg/*l*. The maximum observed effluent dibromochloromethane concentration was 9.5 µg/*l*. Effluent Limitations for dibromochloromethane are included in this Order.

Dichlorobromomethane-Based on information included in analytical laboratory results submitted by the Discharger, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR standards for dichlorobromomethane. The CTR includes standards for the protection of human health based on a one-in-a-million cancer risk for dichlorobromomethane. Municipal and domestic supply is a beneficial use of the receiving water. The criterion for waters from which both water and organisms are consumed is 0.56 µg/*l*. The maximum observed effluent dichlorobromomethane concentration was 18 µg/*l*. Effluent Limitations for dichlorobromomethane are included in this Order.

Flow—The WWTF was designed to provide secondary level of treatment for up to its design flow of 7.5 mgd. The effluent flow limit is therefore set at 7.5 mgd.

Iron—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*." Municipal and domestic supply is a beneficial use of the receiving stream. Based on information included in analytical laboratory reports submitted by the Discharger, iron in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Secondary Maximum Contaminant Level (MCL)-Consumer Acceptance Limit of 300 µg/*l*. The Basin Plan also includes a water quality objective that water "…*shall be free of discoloration that causes nuisance or adversely affects beneficial uses*." The Basin Plan identifies non-contact water recreation, which includes aesthetic enjoyment, as a beneficial use of the Sacramento River. Iron concentrations in excess of the Secondary MCL-Consumer Acceptance Limit cause aesthetically undesirable discoloration. The maximum observed effluent iron concentration was 210 µg/*l*. Although the concentration is lower than the standard, using statistical analysis iron has a reasonable potential to cause or contribute to an in stream excursion above the Secondary MCL. An Effluent Limitation for iron is included in this Order and is based on protection of the Basin Plan water quality objectives for chemical constituents and color and the DHS Secondary MCL.

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Y	F	fY	$y = Y - \bar{Y}$	y^2	fy^2
210	1	210	122.4	14,981	
94	1	94	6.4	41	
82	1	82	-5.6	31	
0.092	1	0.092	-87.5	7657	
Nd*	1	50	-37.6	1413	
Totals	$\sum f = 5$	$\sum fY = 438$			$\sum fy^2 = 24{,}123$

Concentration (µg/l) = $Y = 210$
Frequency = $f = 5$
Number of Samples = $n = \sum f = 5$
Mean = $\bar{Y} = \frac{\sum fY}{n} = \frac{24{,}123}{5} = 87.6$
Variance = $S^2 = \frac{\sum fy^2}{} = 4824.6$
Standard Deviation = $S = \sqrt{S^2} = \sqrt{4824.6} = 69.5$
Coefficient of Variation = $C_V = \frac{S}{\bar{Y}} = \frac{69.5}{87.6} = 0.8$
@ $C_V = 0.8$ and n = 5, with a 99% Confidence Limit → Multiplication Factor ≈ 6.2
→ 210 µg/l x 6.2 = 1302 µg/l
Secondary MCL criteria = 300 µg/l , therefore reasonable potential
*Coefficient of Variation = 0.6 if more than 80% of the samples are non detect; 0.6 if less than 10 samples; if nd < 80% samples, then nd = CQL
* Multiplication Factor from Table 3-1, page 54, of U.S. EPA *Technical Support Document For Water Quality-based Toxics Control*.

Manganese-Based on information included in analytical laboratory reports submitted by the Discharger, high concentrations of manganese are in effluent. The discharge has a reasonable potential to cause or contribute to an in-stream excursion above a level necessary to protect drinking water. U.S. EPA and California developed Drinking Water Secondary MCL's for manganese and is 50 µg/l. Effluent concentrations of manganese were as high as 55 µg/l. Effluent limitations for manganese are included in this Order and are based on protection of the municipal and domestic beneficial use of the receiving stream.

Methyl-tert-butyl (MTBE)-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*." Municipal and domestic supply is a beneficial use of the receiving stream. Based on information included in analytical laboratory reports submitted by the Discharger, MTBE in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Primary MCL of 13 µg/*l* and the Secondary Maximum Contaminant Level (MCL)-Consumer Acceptance Limit of 5 µg/*l* for MTBE. The maximum observed effluent MTBE concentration was 220 µg/*l*. An Effluent Limitation for MTBE is included in this Order and is based on protection of the Basin Plan water quality objectives for chemical constituents and the DHS Secondary MCL.

Silver-The CTR criterion for metals are presented in dissolved concentrations. U.S. EPA recommends conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for silver in freshwater are 0.850 for the instantaneous maximum criteria. Using the worst-case,

lowest of hardness of the Sacramento River measured by SRCSD is 26 mg/l, the corresponding standards for total silver is 0.4 µg/*l* as an instantaneous maximum. The maximum observed effluent silver concentration was 2.2 µg/l. The effluent limitation for silver is presented in total recoverable concentration, and included in this Order.

The U.S. EPA Technical Support Document for Water Quality-based Toxics Control recommends converting acute (one-hour average) and chronic (four-day average) aquatic life criteria to maximum daily and average monthly effluent limitations. Conversions are demonstrated in the following equations:

$$LTA_{ac} = WLA_{ac} \times \exp\left(0.5\sigma^2 - z\sigma\right)$$
$$LTA_c = WLA_c \times \exp\left(0.5\sigma_4{}^2 - z\sigma_4\right)$$
$$LTA = \min\left(LTA_C, LTA_{ac}\right)$$
$$AMEL = LTA \times \exp\left(z\sigma_n - 0.5\sigma_n{}^2\right)$$
$$MDEL = LTA \times \exp\left(z\sigma - 0.5\sigma^2\right)$$

where

LTA_{ac} = Acute long-term average wasteload in chronic units
LTA_c = Chronic long-term average wasteload
WLA_{ac} = Acute wasteload allocation in chronic toxic units
LTA = Long-term average
σ = Standard deviation
AMEL = Average monthly effluent limitation
MDEL = Maximum daily effluent limitation

Using above equations with a coefficient of 0.6 (since 80% or more of the samples were non-detect), maximum daily and average monthly concentration-based Effluent Limitations for silver are shown in Attachment G.

Thallium-Based on information included in analytical laboratory reports submitted by the Discharger, the discharge has a reasonable potential to cause or contribute to an in stream excursion above the CTR standards for thallium. The CTR standards for protection of human health for Drinking Water Sources is 0.17 µg/l. In addition the California drinking water MCL for thallium is 2 µg/l. The maximum observable concentration for thallium is 4.8 µg/l. Effluent limit for thallium is included in this Order and are based on the CTR standards for the protection of drinking water.

Total Trihalomethanes- The U.S. EPA has established a primary MCL for total trihalomethanes, the sum of bromoform, bromodichloromethan, chloroform and dibromochloromethane at 80 µg/l , which is lower than the current MCL of 100 µg/l. The Safe Drinking Water Act requires that California Department of Health Services has proposed to revise regulations in Title 22 of CCR to establish a California MCL for total trihalomethanes at 80 µg/l. To protect future municipal and domestic supply beneficial uses, this Order establishes an Effluent Limitation for total trihalomethanes. Based on information included in analytical laboratory results submitted by the Discharger, the discharge was found to have a maximum concentration of 77.0 µg/l of total trihalomethanes. A statistical shows

there is reasonable potential to exceed the 80 µg/l MCL. Therefore, an Effluent Limitation for total trihalomethanes is included in this Order.

Zinc- Based on information included in analytical laboratory reports submitted by the Discharger, the discharge has a reasonable potential to cause or contribute to an in stream excursion above the CTR for zinc. Using the worst-case, lowest of hardness of the Sacramento River measured by SRCSD is 26 mg/l, the corresponding criterion for total zinc are 38 µg/*l* and 38 µg/*l* for the acute and chronic criteria, respectively. The maximum observable concentration for zinc is 1300 µg/l. An effluent limit for zinc is included in this Order and is based on the CTR.

The U.S. EPA Technical Support Document for Water Quality-based Toxics Control recommends converting acute (one-hour average) and chronic (four-day average) aquatic life criteria to maximum daily and average monthly effluent limitations. Conversions are demonstrated in the following equations:

$$LTA_{ac} = WLA_{ac} \times \exp\left(0.5\sigma^2 - z\sigma\right)$$
$$LTA_c = WLA_c \times \exp\left(0.5\sigma_4{}^2 - z\sigma_4\right)$$
$$LTA = \min\left(LTA_C, LTA_{ac}\right)$$
$$AMEL = LTA \times \exp\left(z\sigma_n - 0.5\sigma_n{}^2\right)$$
$$MDEL = LTA \times \exp\left(z\sigma - 0.5\sigma^2\right)$$

where

LTA_{ac} = Acute long-term average wasteload in chronic units
LTA_c = Chronic long-term average wasteload
WLA_{ac} = Acute wasteload allocation in chronic toxic units
LTA = Long-term average
σ = Standard deviation
AMEL = Average monthly effluent limitation
MDEL = Maximum daily effluent limitation

Using above equations with a coefficient of 0.4, maximum daily and average monthly concentration-based Effluent Limitations for zinc are shown in Attachment H.

pH—The Basin Plan includes a water quality objective for surface waters (except for Goose Lake) that the "…*pH shall not be depressed below 6.5 nor raised above 8.5*."

Settleable Solids—For inland surface waters, the Basin Plan states that "[w]*ater shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.*" Order No. R5-2003-0087 contains average monthly and average daily effluent limitations for settleable solids.

No Reasonable Potential –Reasonable potential analyses was completed for the following constituents. The analyses showed no reasonable potential, therefore no limits for these constituents are included in the Order.

1,2-Dichlorobenzene

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– Reasonable Potential Analysis

Y	f	fY	$y = Y - \overline{Y}$	y^2	fy^2
0.67	1				
Nd*	20				
Totals	∑f =	∑fY =			$\sum fy^2$ =

1,2-Dichlorobenzene Concentration (µg/l) = *Y =0.67*
Frequency = *f =21*
Number of Samples = $n = \sum f = 21$
Mean = $Y = \overline{\sum fY}$ = =
Variance = $S^2 = \underline{\sum fy^2}$ =
Standard Deviation = $S = \sqrt{S^2} = \sqrt{\quad}$
Coefficient of Variation = $C_V = \underline{S}$ =
@ C_V = 0.6 and n = 21, with a 99% Confidence Limit → Multiplication Factor * ≈ 2.3
→ 0.67 µg/l x 2.3 = 1.54 µg/l
Primary MCL = 5.0 µg/l , therefore no reasonable potential
*Coefficient of Variation = 0.6 if more than 80% of the samples are non detect;0.6 if less than 10 samples; if nd < 80% samples, then nd = CQL
* Multiplication Factor from Table 3-1, page 54, of U.S. EPA Technical Support Document For Water Quality-based Toxics Control.

Antimony – Reasonable Potential Analysis

Y	f	fY	$y = Y - \overline{Y}$	y^2	fy^2
2.4	1				
Nd*	21				
Totals	∑f =	∑fY =			$\sum fy^2$ =

Antimony Concentration (µg/l) = *Y =2.4*
Frequency = *f =21*
Number of Samples = $n = \sum f = 21$
Mean = $Y = \overline{\sum fY}$ = =
n
Variance = $S^2 = \underline{\sum fy^2}$ =
n
Standard Deviation = $S = \sqrt{S^2} = \sqrt{\quad}$
Coefficient of Variation = $C_V = \underline{S}$ =
$\overline{Y}$
@ C_V = 0.6 and n = 21, with a 99% Confidence Limit → Multiplication Factor * ≈ 2.3
→ 2.4 µg/l x 2.3 = 5.52 µg/l
Primary MCL criteria = 6.0 µg/l , therefore no reasonable potential
*Coefficient of Variation = 0.6 if more than 80% of the samples are non detect; 0.6 if less than 10 samples; if nd < 80% samples, then nd = CQL
* Multiplication Factor from Table 3-1, page 54, of U.S. EPA *Technical Support Document For Water Quality-based Toxics Control*.

Arsenic– Reasonable Potential Analysis

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Y	f	fY	$y = Y - \overline{Y}$	y^2	fy^2
1.60	1				
1.2	1				
Nd*	17				
Totals	∑f =	∑fY =			$\sum fy^2$ =

Arsenic Concentration (µg/l) = $Y = 1.6$
Frequency = $f = 21$
Number of Samples = $n = \sum f = 21$
Mean = $\overline{Y} = \frac{\sum fY}{n}$ = =
Variance = $S^2 = \frac{\sum fy^2}{n}$ =
Standard Deviation = $S = \sqrt{S^2} = \sqrt{\quad}$
Coefficient of Variation = $C_V = \frac{S}{\overline{Y}}$ =

@ $C_V = 0.6$ and $n = 21$, with a 99% Confidence Limit → Multiplication Factor * ≈ 2.3
→ 1.6 µg/l x 2.3 = 3.8 µg/l
Primary MCL criteria = 10.0 µg/l , therefore no reasonable potential
*Coefficient of Variation = 0.6 if more than 80% of the samples are non detect; 0.6 if less than 10 samples; if nd < 80% samples, then nd = CQL
* Multiplication Factor from Table 3-1, page 54, of U.S. EPA *Technical Support Document For Water Quality-based Toxics Control*.

Barium– Reasonable Potential Analysis

Y	f	fY	$y = Y - \overline{Y}$	y^2	fy^2
29	1	29	13.2	178.24	178.24
22	1	22	6.2	38.44	38.44
16	1	16	0.2	0.04	0.04
12	1	12	-3.8	14.44	14.44
0.013	1	0.013	-15.78	249	249
Totals	∑f =5	∑fY =79.013			$\sum fy^2$ =476.16

Barium Concentration (µg/l) = $Y = 2.9$
Frequency = $f = 5$
Number of Samples = $n = \sum f = 5$
Mean = $\overline{Y} = \frac{\sum fY}{n}$ = = 15.8
Variance = $S^2 = \frac{\sum fy^2}{n} = \frac{476.16}{5}$ =95.23
Standard Deviation = $S = \sqrt{S^2} = \sqrt{95.23}$ =9.76
Coefficient of Variation = $C_V = \frac{S}{\overline{Y}} = \frac{9.76}{29}$ = 0.33

@ $C_V = 0.33$ and $n = 5$, with a 99% Confidence Limit → Multiplication Factor * ≈ 1.8
→ 29 µg/l x 1.8 = 52.2 µg/l
Basin Plan Objective criteria = 100 µg/l , therefore no reasonable potential
*Coefficient of Variation = 0.6 if more than 80% of the samples are non detect; 0.6 if less than 10 samples; if nd < 80% samples, then nd = CQL
* Multiplication Factor from Table 3-1, page 54, of U.S. EPA *Technical Support Document For Water Quality-based Toxics Control*.

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Total Chromium– Reasonable Potential Analysis

Y	f	fY	$y = Y - \overline{Y}$	y^2	fy^2
4.3	1	4.3	0.78	0.6	0.6
2.1	1	2.1	-1.42	2.01	2.01
1.7	1	1.7	-1.82	3.31	3.31
1.5	1	1.5	-1.12	1.25	1.25
2.4	1	2.4	30.48	929	929
34	1	34	10.48	109.83	109.83
14	1	14	10.48	109.83	1537.62
nd	14	14			
Totals	$\sum f = 21$	$\sum fY = 74$			$\sum fy^2 = 2583.62$

Total Chromium Concentration (µg/l) = $Y = 34$
Frequency = $f = 21$
Number of Samples = $n = \sum f = 21$
Mean = $\overline{Y} = \frac{\sum fY}{n} = \frac{74}{21} = 3.52$
Variance = $S^2 = \frac{\sum fy^2}{n} = \frac{2583.62}{21} = 123$
Standard Deviation = $S = \sqrt{S^2} = \sqrt{123} = 11$
Coefficient of Variation = $C_V = \frac{S}{\overline{Y}} = \frac{11}{74} = 0.143$
@ $C_V = 0.15$ and $n = 21$, with a 99% Confidence Limit → Multiplication Factor * ≈ 1.25
→ 34 µg/l x 1.25 = 42.5 µg/l
Primary MCL criteria = 50 µg/l , therefore no reasonable potential
*Coefficient of Variation = 0.6 if more than 80% of the samples are non detect; 0.6 if less than 10 samples; if nd < 80% samples, then nd = CQL
* Multiplication Factor from Table 3-1, page 54, of U.S. EPA *Technical Support Document For Water Quality-based Toxics Control*.

Flouride– Reasonable Potential Analysis

Y	f	fY	$y = Y - \overline{Y}$	y^2	fy^2
350	1	350	118	13,924	13,924
290	1	290	58	3364	3364
260	1	260	28	784	784
260	1	260	28	784	784
Nd*	1	0.05	231	53,580	53,580
Totals	$\sum f = 5$	$\sum fY = 1160$			$\sum fy^2 = 72,436$

Flouride Concentration (µg/l) = $Y = 350$
Frequency = $f = 5$
Number of Samples = $n = \sum f = 5$
Mean = $\overline{Y} = \frac{\sum fY}{n} = \frac{1160}{5} = 232$
Variance = $S^2 = \frac{\sum fy^2}{n} = \frac{72,436}{5} = 14,487$
Standard Deviation = $S = \sqrt{S^2} = \sqrt{14,487} = 120$

Coefficient of Variation = C_V = $\frac{S}{\bar{Y}}$ = $\frac{120}{232}$

@ C_V = 0.51 and n = 5, with a 99% Confidence Limit → Multiplication Factor ≈ 3.4

→ 350 µg/l x 3.4 = 1190 µg/l

Public Health Goal criteria = 1000 µg/l , therefore reasonable potential

*Coefficient of Variation = 0.6 if more than 80% of the samples are non detect; 0.6 if less than 10 samples; if nd < 80% samples, then nd = CQL

* Multiplication Factor from Table 3-1, page 54, of U.S. EPA *Technical Support Document For Water Quality-based Toxics Control*.

Tertiary Treatment -The Sacramento River has the beneficial uses of contact recreation and agricultural irrigation. Additionally, the database for Water Rights with the State Water Resources Control Board indicates there are water right permits for agricultural irrigation downstream of the City of West Sacramento's discharge. The outfall for the City of West Sacramento is located approximately 3 miles downstream from the Sacramento Regional County Sanitation District (SRCSD) outfall on the Sacramento River. Order No. 5-00-188, NPDES Permit No. CA0077682 for the Sacramento Regional County Sanitation District includes Finding Nos. 6 and 7 that state that the Sacramento River in the vicinity of the SRCSD outfall is influenced by tides. As a result of the slack flows, flow reversals can occur. Therefore the SRCSD is prohibited from discharging effluent when flow ratios are less than 14:1 and Sacramento River flows are less than 1300 cfs. The current average dry weather flow for SCRSD is 165 mgd (255 cfs). The Department of Health Services requires a 20:1 dilution of surface water to secondary effluent or tertiary treatment if contact recreation and agricultural irrigation are beneficial uses of the water body. Review of the self-monitoring reports for SRCSD indicates river flow with less than 20:1 dilution, therefore no assimilative capacity for total coliforms is available to the City of West Sacramento. Until the City connects to the SRCSD treatment plant, the DHS recommends the effluent does not exceed an MPN of 23 per 100 milliliters utilizing the results of the last seven days for which analyses have been completed and the total coliform bacteria does not exceed an MPN of 240 per 100 milliliters in more than sample in any 30 day period. Since the City of West Sacramento is planning to connect to the SRCSD plant, within the five-year life of this permit, tertiary treatment is not being required at this time. However, if the City of West Sacramento does not connect to the SRCSD then this Order may be reopened to consider tertiary treatment limits.

Interim Limitations - As stated in the above Findings, the U.S. EPA adopted the NTR and the CTR, which contains water quality criteria applicable to this discharge and the SIP that contains guidance on implementation of the NTR and CTR. The SIP, Section 2.2.1, requires that if a compliance schedule is granted for a CTR or NTR constituent, the Regional Board shall establish interim requirements and dates for their achievement in the NPDES permit. The interim limitations must: be based on current treatment plant performance or existing permit limitations, whichever is more stringent; include interim compliance dates separated by no more than one year, and; be included in the Provisions. The interim limitations in this Order are based on the current treatment plant performance. In developing the interim limitation, where there are ten sampling data points or more, sampling and laboratory variability is accounted for by establishing interim limits that are based on normally distributed data where 99.9% of the data points will lie within 3.3 standard deviations of the mean (*Basic Statistical Methods for Engineers and Scientists, Kennedy and Neville, Harper and Row*). Therefore, the interim limitations in this Order are established as the mean plus 3.3 standard deviations of the available data. Where actual sampling shows an exceedance of the proposed 3.3-standard deviation interim limit, the maximum detected concentration has been established as the interim limitation. When there are less

than ten sampling data points available, the *Technical Support Document for Water Quality Based Toxics Control* ((EPA/505/2-90-001)TSD) recommends a coefficient of variation of 0.6 be utilized as representative of wastewater effluent sampling. The TSD recognizes that a minimum of ten data points is necessary to conduct a valid statistical analysis. The multipliers contained in Table 5-2 of the TSD are used to determine a maximum daily limitation based on a long-term average objective. In this case, the long-term average objective is to maintain, at a minimum, the current plant performance level. Therefore, when there are less than ten sampling points for a constituent, interim limitations are based on 3.11 times the maximum observed sampling point to obtain the daily maximum interim limitation (*TSD, Table 5-2*). The Regional Board finds that the Discharger can undertake source control and treatment plant measures to maintain compliance with the interim limitations included in this Order. Interim limitations are established when compliance with NTR- and CTR-based Effluent Limitations cannot be achieved by the existing discharge. Discharge of constituents in concentrations in excess of the final Effluent Limitations, but in compliance with the interim Effluent Limitations, can significantly degrade water quality and adversely affect the beneficial uses of the receiving stream on a long-term basis. For example, U.S. EPA states in the Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life for copper, that it will take an unstressed system approximately three years to recover from a pollutant in which exposure to copper exceeds the recommended criterion. The interim limitations, however, establish an enforceable ceiling concentration until compliance with the Effluent Limitation can be achieved.

The *SIP* states that if "*…all reported detection limits of the pollutant in the effluent are greater than or equal to the C* [water quality criterion or objective] *value, the RWQCB* [Regional Board] *shall establish interim requirements…that require additional monitoring for the pollutant….*" All reported detection limits for 1,1,2,2-tetrachloroethane, 1,2-dichloroethane, acrylonitrile, carbon tetrachloride, hexachlorobenzene, hexachlorobutadiene, 1,2-benzanthracene; 1,2-diphenylhydrazine, 2-chlorophenol, 2,4-dichlorophenol, 2,4-dinitrotoluene; 2,6-dinitrotoluene, 3,3'-dichlorobenzidine; 3,4-benzfluoranthene; benzidine; benzo(a)pyrene; benzo(k)fluoranthene; bis(2-chloroethyle) ether; chrysene; dibenzo (a,h)-anthracene; indeno(1,2,3-c,d)pyrene; N-nitrosodimethylamine; N-nitrosodi-n-propylamine; 4,4'-DDD; 4,4'-DDE; alpha-hexachlorocyclohexane (α-BHC); aldrin; chlordane; dieldrin; heptachlor; heptachlor epoxide; PCB-1016; PCB-1221; PCB-1232; PCB-1242; PCB-1248; PCB-1254; PCB-1260; carbofuran, 1,2-dibromo-3-chloropropane, diquat, ethylene dibromide and 2,3,7,8-TCDD (Dioxin) are greater than or equal to corresponding applicable water quality criteria or objectives. Monitoring for these constituents has been included in this Order in accordance with the SIP.

Compliance Schedules—The use and location of compliances schedules in the permit depends on the Discharger's ability to comply and the source of the applied water quality criteria. For CTR-based Effluent Limitations, compliance schedules were included within the permit. For non-CTR-based Effluent Limitations, any necessary time schedules were generally included in the accompanying cease and desist order.

General Effluent Limitation Information—

Selected 40 CFR §122.2 definitions:

'*Average monthly discharge limitation* means 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 discharge limitation means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week.

Continuous discharge means a "discharge" which occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or other similar activities.

Daily discharge means the "discharge of a pollutant" measured during a calendar day or any 24-hour period that reasonable represents a calendar day for purposes of sampling. 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 average measurement of the pollutant over the day.

Maximum daily discharge limitation means the highest allowable "daily discharge".'

The SIP contains similar definitions. These definitions were used in the development of Order No. R5-2003-0087. Alternate limitation period terms were used in the permit for the sake of clarity. Alternates are shown in the following table:

Term Used in Permit	SIP/40 CFR 122.2 Term
Average monthly	Average monthly discharge limitation. 30-day averages may have been converted to monthly averages to conform with 40 CFR §122.45 (see below)
Average daily	Maximum daily discharge limitation. Since the daily discharge for limitations expressed in concentrations is defined as the average measurement of the pollutant over the day, the term 'Average Daily' was used in the Order.

40 CFR §122.45 states that:

(1) "In the case of POTWs, permit effluent limitations…shall be calculated based on design flow."

(2) "For continuous discharges all permit effluent limitations…shall unless impracticable be stated as…[a]verage weekly and average monthly discharge limitations for POTWs."

(3) "All pollutants limited in permits shall have limitations…expressed in terms of mass except…[f]or pH, temperature, radiation, or other pollutants which cannot appropriately be

> expressed by mass…Pollutants limited in terms of mass additionally may be limited in terms of other units of measurement, and the permit shall require the permittee to comply with both limitations."

U.S. EPA recommends a maximum daily limitation rather than an average weekly limitation for water quality based permitting.

No recommended or approved methods have been provided for converting human health and four-day and one-hour toxicity criteria, standards, and objectives to weekly average effluent limitations; therefore, the conversion to weekly average limitations is impracticable.

RECEIVING WATER LIMITATIONS AND MONITORING

***Fecal coliform*—**The Sacramento River has been designated as having the beneficial use of contact recreation (REC-1). For water bodies designated as having REC-1 as a beneficial use, the Basin Plan includes a water quality objective limiting the "…*fecal coliform concentration based on a minimum of not less than five samples for any 30-day period*…" to a maximum geometric mean of 200 MPN/100 ml. The objective also states that "…[no] *more than ten percent of the total number of samples taken during any 30-day period* [shall] *exceed 400/100 ml*." This objective is included in the Order as a receiving water limitation.

***Dissolved Oxygen*—**The Sacramento River has been designated as having the beneficial use of cold freshwater aquatic habitat (COLD). For water bodies designated as having COLD as a beneficial use, the Basin Plan includes a water quality objective of maintaining a minimum of 7.0 mg/*l* of dissolved oxygen. Since the beneficial use of COLD does apply to the Sacramento River, a receiving water limitation of 7.0 mg/*l* for dissolved oxygen was included in the Order.

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

***pH*—**For all surface water bodies in the Sacramento River and San Joaquin River basins, the Basin Plan includes water quality objectives stating that "[t]*he pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses*." The Order includes receiving water limitations for both pH range and pH change.

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

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

intrastate waters be increased more than 5ºF above natural receiving water temperature." The Order includes a receiving water limitation based on this objective.

Turbidity—The Basin Plan includes the following objective: "*Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits*:

- Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.
- Where natural turbidity is between 5 and 10 NTUs, increases shall not exceed 20 percent.
- Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTU.
- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent."

Ammonia and Chlorine—U.S. EPA has developed Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life for ammonia and for chlorine. The Order contains effluent limitations for ammonia and for chlorine equal to the Ambient Water Quality Criteria. Compliance with the effluent limitations for ammonia and for chlorine means that the discharge cannot cause an exceedance of the criteria in the receiving stream; in other words, the limitations are fully protective of water quality. Therefore, no receiving water ammonia or chlorine limitations are included in the Order.

Narrative Limitations—Receiving Water Limitations (biostimulatory substances), (color), (floating material), (oil and grease), (radioactivity), (settleable material), (tastes and odors), and (toxicity) are based on narrative Basin Plan objectives. The objectives are located in Chapter III: Water Quality Objectives, under the Water Quality Objectives for Inland Surface Waters heading.

GROUNDWATER BENEFICIAL USES

In allowing a discharge, the Regional Board must comply with CWC Section 13263 in setting appropriate conditions. The Regional Board is required, relative to the groundwater that may be affected by the discharge, to implement the Basin Plan and consider the beneficial uses to be protected along with the water quality objectives essential for that purpose. The Regional Board need not authorize the full utilization of the waste assimilation capacity of the groundwater (CWC Section 13263(b)) but must consider other waste discharges and factors that affect that capacity. The Basin Plan establishes the beneficial uses for area groundwater as municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply. Procedures for application of water quality objectives to protect these uses, and the process for and factors to consider in allocating waste assimilation capacity, are set forth in the Basin Plan.

The antidegradation directives of CWC Section 13000 require that waters of the State that are better in quality than established water quality objectives be maintained "consistent with the maximum benefit to the people of the State." Waters can be of high quality for some constituents or beneficial uses and not others. Policies and procedures for complying with this directive are set forth in the Basin Plan (including by reference State Water Board Resolution No. 68-16, "Statement of Policy With Respect to Maintaining High Quality Waters in California," commonly referred to for convenience by Resolution 68-16 or as the "Antidegradation" Policy).

Resolution 68-16 establishes essentially a two-step process to comply with the policy. The first step is if a discharge will degrade high quality water, the discharge may be allowed if any change in water quality (a) will be consistent with maximum benefit to the people of the State, (b) will not unreasonably affect present and anticipated beneficial uses of such water, and (c) will not result in water quality less than that prescribed in State policies (*e.g.*, water quality objectives in the Basin Plan). The second step is that any activities that result in discharges to such high quality waters are required to use the best practicable treatment or control (BPTC) of the discharge necessary to avoid a pollution or nuisance and to maintain the highest water quality consistent with the maximum benefit to the people of the State.

In authorizing waste discharges, the Regional Board evaluates each case to determine whether degradation should be allowed and then either proscribes or limits the degradation on a constituent-by-constituent basis to that which complies with Resolution 68-16. If allowing water quality degradation, the Regional Board must first find that the degradation is at least balanced by the benefit to the public of the activity creating the discharge and that the discharge undergoes BPTC. To facilitate this process and protect their interests, dischargers must provide material and relevant technical information that fully characterizes:

- site-specific hydrogeologic conditions
- background quality of the receiving water
- background quality of other waters that may be affected by the discharge
- all waste constituents to be discharged
- waste treatment and control measures
- how treatment and control measures qualify as BPTC
- the extent that each waste constituent after BPTC will degrade the quality of the groundwater
- how the expected degradation compares to water quality objectives
- how the expected degradation is consistent with maximum public benefit

Water quality objectives (objectives) define the least stringent criteria that could apply as water quality limitations for groundwater at this location, except where natural background quality already exceeds the objective. When the Regional Board adopts objectives in the Basin Plan, it is required to comply with CWC Section 13241, including consideration of economics. Section 13241 does not indicate how the Regional Board is to consider economics in its decisions or emphasize any one of the Section 13241 factors over another. Regardless, Section 13241 applies to the imposition of requirements only when the Regional Board is considering whether to impose groundwater limitations more stringent than an objective (see SWRCB Order WQ 95-4, slip op. page 5). Even where a Basin Plan narrative objective exists, and the Regional Board adopts a numeric effluent limitation in waste discharge requirements to implement the narrative objective, the Regional Board is not required to consider the factors in CWC Section 13241.

The objectives in the Basin Plan occur in numeric and narrative form. In issuing waste discharge requirements, the Regional Board must implement the Basin Plan, including all its objectives, but need not allow degradation to the objectives (California Water Code Section 13263). Narrative objectives

generally specify that groundwater shall not contain constituents (e.g., chemicals, pesticides, toxic substances, taste- and odor-producing substances) in concentrations that adversely affect beneficial uses. For some narrative objectives, the Basin Plan establishes minimum numerical objectives. Basin Plan numerical objectives are the concentration thresholds necessary for the reasonable protection of beneficial uses of the water. For example, the narrative objective for chemical constituents specifies that, as a minimum, groundwaters designated for municipal supply shall not exceed maximum contaminant levels (MCLs). Similar objectives exist for radioactivity and pesticides. Numeric objectives based on these MCLs are in Title 22, Sections 64431 (Inorganic Chemicals); 64431 (Fluoride); 64443 (Radioactivity); 64444 (Organic Chemicals); and 64449 (Secondary MCLs – Consumer Acceptance Limits). Numeric objectives in the Basin Plan intended to assure protection of municipal supply also include total coliform of less than 2.2/100 m*l*.

GROUNDWATER LIMITATIONS AND MONITORING

Electrical Conductivity—The beneficial uses of groundwater include municipal and domestic water supply (MUN). The California Department of Health Services has listed a Secondary Maximum Contaminant Level for specific conductance. There is potential for the wastewater percolating to groundwater to cause or contribute to elevated specific conductance in the groundwater.

Total Coliform Organisms—The Basin Plan includes the following water quality objective: "In ground waters used for domestic or municipal supply (MUN) the most probable number of coliform organisms over any seven-day period shall be less than 2.2/100 ml."

Nitrogen—Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrite and nitrite to nitrate, and denitrification is a process that converts nitrate to nitrogen gas, which is then released to the atmosphere. Wastewater treatment plants commonly use nitrification and denitrification processes to remove ammonia from the waste stream. The beneficial uses of groundwater include municipal and domestic water supply (MUN).

For nitrogen, California Department of Health Services has developed a Primary Maximum Contaminant Level (MCL) of 10 mg/*l*. The conversion of ammonia to nitrates presents a reasonable potential for the wastewater percolating to groundwater to cause the groundwater to exceed the Primary Maximum Contaminant Level for nitrogen. Denitrification reduces the potential for the Discharger to cause an exceedance of the Primary MCL for nitrogen.

pH— The ponds at the City of West Sacramento WWTF are unlined, so wastewater stored in the pond or disposed of by spray irrigation may percolate to groundwater. The Basin Plan includes a water quality objective for groundwater that "[g]*round waters shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses*." The beneficial uses of groundwater include municipal and domestic water supply (MUN), agricultural supply (AGR), industrial service supply (IND), and industrial process supply (PRO).

U.S. EPA has a Secondary Maximum Contaminant Level (or Secondary Standard) for drinking water pH of 6.5 to 8.5 units. The noticeable effects of pH outside of the Secondary Standard range include (a) for a low pH: bitter metallic taste; corrosion and (b) for a high pH: slippery feel; soda taste;

deposits [U.S. EPA, Secondary Drinking Water Regulations: Guidance for Nuisance Chemicals, http://www.epa.gov/safewater].

Potential corrosion and deposits caused by a pH outside of the 6.5 to 8.5 range would adversely affect the beneficial use of industrial process supply, which is defined in the Basin Plan as: "*Uses of water for industrial activities that depend primarily on water quality*."

Low pH values cause metals to dissolve, allowing them to percolate into groundwater. Elevated metal concentrations in the groundwater would violate the groundwater toxicity objective included in the Basin Plan.

KCH 3 July 2003