

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2004-0096

NPDES NO. CA0079022

WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF LIVE OAK
WASTEWATER TREATMENT PLANT
SUTTER COUNTY

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

BACKGROUND

1. The City of Live Oak (hereafter Discharger) submitted a Report of Waste Discharge, dated 10 October 2003, and applied for a permit renewal to discharge waste under the National Pollutant Discharge Elimination System (NPDES) from the City's Wastewater Treatment Plant. Supplemental information to complete filing of the application was submitted on 12 November 2003 and 5 January 2004.
2. The Discharger owns and operates a wastewater collection, treatment, and disposal system, and provides sewerage service to Live Oak with a population of approximately 8,000. The treatment plant is located on Assessor's Parcel Number (APN) 51-020-009 in Section 7, T16N, R3E, MDB&M, as shown on Attachment A, a part of this Order. Treated municipal wastewater is discharged to Reclamation District 777 Lateral Drain No. 1, a water of the United States and a tributary to Main Canal and the Sutter Bypass at the point, latitude 39°, 15', 48" (deg, min, sec) and longitude 121°, 40', 42".
3. The treatment system consists of aeration lagoons, oxidation ponds, disinfection by chlorination, and dechlorination. Based on data submitted by the Discharger, discharge to Reclamation District 777 Lateral Drain No. 1 (Outfall 001) can be described as follows:

Design Average Dry Weather Flow	1.4	million gallons per day (mgd)
Design Peak Wet Weather Flow	5.9	mgd
Annual Average Daily Flow Rate	0.51	mgd
Maximum Daily Flow Rate	5.32	mgd
Average Temperature, Summer	75.3	°F
Average Temperature, Winter	49.3	°F
Average Daily Biochemical Oxygen Demand (BOD)	26	mg/l
Maximum Daily BOD	92	mg/l
Average Daily Total Suspended Solids (TSS)	35	mg/l
Maximum Daily TSS	150	mg/l

4. 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.
5. U.S. EPA adopted the *National Toxics Rule* on 22 December 1992 (amended on 4 May 1995 and 9 November 1999) and the *California Toxics Rule* on 18 May 2000 (amended on 13 February 2001). 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 *National Toxics Rule* and the *California Toxics Rule*.

BENEFICIAL USES OF THE RECEIVING STREAM

6. The Basin Plan, at page II-2.00, states: “*Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams.*” The Basin Plan does not specifically identify beneficial uses for Reclamation District 777 Lateral Drain No. 1, but the Basin Plan does identify present and potential uses for the Sutter Bypass, to which Reclamation District 777 Lateral Drain No. 1, via Main Canal, is tributary.

The Basin Plan identifies the following beneficial uses for the Sutter Bypass: agricultural irrigation, body contact water recreation, warm freshwater aquatic habitat, cold fish migration habitat, cold spawning habitat, and wildlife habitat.

State Water Resources Control Board Resolution No. 88-63 “Sources of Drinking Water”, incorporated into the Basin Plan pursuant to Regional Board Resolution 89-056, provides that “*All surface and ground waters of the State are considered suitable, or potentially suitable, for municipal or domestic water supply and should be so designated by the Regional Boards with the exception of: ...2.b. The water is in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters...*”. Although originally a natural water body, Reclamation District 777 Lateral Drain No. 1 was channelized for the purpose of conveying agricultural drainage waters. Therefore, Reclamation District 777 Lateral Drain No.1 could likely meet the criteria for a municipal and domestic supply exemption under Resolution 88-63.

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

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

In reviewing whether the existing and/or potential uses of the Sutter Bypass apply to Reclamation District 777 Lateral Drain No. 1, the Regional Board has considered the following facts:

a. *Agricultural Supply*

The State Water Resources Control Board (SWRCB) has issued water rights to existing water users along Reclamation District 777 Lateral Drain No. 1 and Main Canal. Flow direction in Reclamation District 777 Lateral Drain No. 1 varies depending on the location and use of irrigation pumps, confirming the use of the receiving water for agricultural irrigation supply. An individual intake point may alternate between being upstream or downstream of the discharge point. Thus, any of these water users may have intakes located downstream of the discharge.

b. *Water Contact Recreation*

The Regional Board finds that the discharge flows through agricultural and low-density residential areas, there is public access to Reclamation District 777 Drain No. 1, exclusion of the public is unrealistic, and contact recreational activities currently exist along Reclamation District 777 Drain No. 1 and downstream waters and these uses are likely to increase as the population in the area grows. Prior to flowing into the Sutter Bypass, Reclamation District 777 Drain No. 1 flows through areas of general public access, cropland, and residential areas. The Sutter Bypass and downstream waters also offer recreational opportunities.

c. *Groundwater Recharge*

In areas where groundwater elevations are below the stream bottom, water from the stream will percolate to groundwater. Since, absent the discharge, Reclamation District 777 Drain No. 1 is at times dry, it is reasonable to assume that the stream water is lost by evaporation, flow downstream and percolation to groundwater.

d. *Freshwater Replenishment*

When water is present in Reclamation District 777 Drain No. 1, there is hydraulic continuity between Reclamation District 777 Drain No. 1, Main Canal, and the Sutter Bypass. During periods of hydraulic continuity, Reclamation District 777 Drain No. 1 adds to the water quantity and may impact the quality of water flowing down stream in the Sutter Bypass.

e. *Warm and Cold Freshwater Habitats (including preservation or enhancement of fish and invertebrates) and Wildlife Habitat*

Reclamation District 777 Drain No. 1 flows to the Sutter Bypass via Main Canal. The Basin Plan (Table II-1) designates the Sutter Bypass as being a warm freshwater habitat and a cold fish migration and spawning habitat. Therefore, pursuant to the Basin Plan (Table II-1, Footnote (2)), the cold designation applies to Reclamation District 777 Lateral Drain No. 1. The cold-water spawning designation necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/l.

Upon review of the flow conditions, habitat values, and beneficial uses of Reclamation District 777 Lateral Drain No. 1, and the facts described above, the Regional Board finds that the beneficial uses identified in the Basin Plan for the Sutter Bypass are applicable to Reclamation District 777 Lateral Drain No. 1.

The Regional Board also finds that based on the available information and on the Discharger's application, that Reclamation District 777 Lateral Drain No. 1, absent the discharge, is ephemeral. The ephemeral nature of Reclamation District 777 Lateral Drain No. 1 means that the designated beneficial uses must be protected, but that no credit for receiving water dilution is available. Although the discharge, at times, maintains the aquatic habitat, constituents may not be discharged that may cause harm to aquatic life. At other times, natural flows within Reclamation District 777 Lateral Drain No. 1 help support the aquatic life. Both conditions may exist within a short time span, where Reclamation District 777 Lateral Drain No. 1 would be dry without the discharge and periods when sufficient background flows provide hydraulic continuity with Main Canal and the Sutter Bypass. Dry conditions occur primarily in the summer months, but dry conditions may also occur throughout the year, particularly in low rainfall years. The lack of dilution results in more stringent effluent limitations to protect contact recreational uses, drinking water-related uses, agricultural uses and aquatic life. Significant

dilution may occur during and immediately following high rainfall events.

7. The Clean Water Act, Section 303(a-c), required states to adopt numeric criteria where they are necessary to protect designated uses. The Regional Board adopted numeric criteria in the Basin Plan. The Basin Plan is a regulatory reference for meeting the state and federal requirements for water quality control (40 CFR 131.20). State Board Resolution No. 68-16, the Antidegradation Policy, does not allow changes in water quality less than that prescribed in Water Quality Control Plans (Basin Plans). The Basin Plan states that; *“The numerical and narrative water quality objectives define the least stringent standards that the Regional Water Board will apply to regional waters in order to protect beneficial uses.”*

NARRATIVE OBJECTIVES

8. The federal Clean Water Act (CWA) mandates the implementation of effluent limitations that are as stringent as necessary to meet water quality standards established pursuant to state or federal law. (33 USC, § 1311(b)(1)(C); 40 CFR, § 122.44(d)(1)) NPDES permits must incorporate discharge limits necessary to ensure that water quality standards are met. This requirement applies to narrative criteria as well as to criteria specifying maximum amounts of particular pollutants. Pursuant to Federal Regulations, 40 C.F.R. section 122.44(d)(1)(i), NPDES permits must contain limits that control all pollutants that *“are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality.”* Federal Regulations, 40 CFR, Section 122.44(d)(1)(vi), further provide that *“[w]here a state has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority must establish effluent limits.”*
9. The Regional Board’s Basin Plan, page IV-17.00, contains an implementation policy (“Policy for Application of Water Quality Objectives”) that specifies that the Regional Board *“will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives.”* This Policy complies with 40 CFR 122.44(d)(1). With respect to narrative objectives, the Regional Board must establish effluent limitations using one or more of three specified sources, including EPA’s published water quality criteria, a proposed state criterion (*i.e.*, water quality objective), or an explicit state policy interpreting its narrative water quality criteria (*i.e.*, the Regional Board’s “Policy for Application of Water Quality Objectives”)(40 C.F.R. 122.44(d)(1) (vi) (A), (B) or (C)). The Basin Plan contains a narrative objective requiring that: *“All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life”*. The Basin Plan requires the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, toxic substances, radionuclides, or taste and odor producing substances that adversely affect beneficial uses. The beneficial uses include agricultural irrigation, body contact water recreation, warm freshwater aquatic habitat, cold fish

migration habitat, cold spawning habitat, and wildlife habitat. The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and organizations will be utilized in evaluating compliance with the narrative toxicity objective. The Basin Plan also limits chemical constituents in concentrations that adversely affect surface water beneficial uses. For waters designated as municipal and domestic supply, the Basin Plan specifies that, at a minimum, waters shall not contain concentrations of constituents that exceed Maximum Contaminant Levels (MCL) of CCR Title 22. The Basin Plan further states that; to protect all beneficial uses the Regional Board may apply limits more stringent than MCLs. When a reasonable potential exists for exceeding a narrative objective, Federal Regulations mandate numerical effluent limitations and the Basin Plan narrative criteria clearly establish a procedure for translating the narrative objectives into numerical effluent limitations.

EFFLUENT LIMITATIONS AND REASONABLE POTENTIAL

10. 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.
11. 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. The State Water Board “Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California” (also known as the State Implementation Policy or SIP) mandated that Regional Boards require dischargers to surface water characterize their discharge to determine compliance with the CTR and NTR water quality standards. On 10 September 2001, the Executive Officer issued a letter, in accordance with State Water Code Section 13267, requiring all surface water dischargers to complete a specified set of effluent and receiving water sampling for priority pollutants. Because the Discharger had designed and was constructing improvements to the WWTP, the sampling was allowed to be delayed. Provision No. G.4 requires limited additional priority pollutant sampling to be completed to characterize the discharge and to facilitate WWTP improvement design to meet the requirements of this Order. Upon completion of the WWTP improvements, the Discharger will be required to conduct additional priority pollutant sampling to assess compliance with water quality standards and objectives. This Order contains provisions that:
 - a. require the Discharger to conduct a study to provide information as to whether the levels of NTR and CTR constituents, and U.S. EPA priority toxic pollutants in the discharge have the reasonable potential to cause or contribute to an in-stream excursion above a water quality standard, including Basin Plan numeric and narrative objectives and water quality standards, objectives, and criteria;

- b. if the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard, require the Discharger to submit sufficient information to calculate effluent limitations for those constituents; and
 - c. allow the Regional Board to reopen this Order and include effluent limitations for those constituents.
12. 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) (EPCRA) 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*”. U.S. EPA’s Toxics Release Inventory lists no compounds for the 95953 ZIP code (Live Oak, CA). The Regional Board has not, at this time, identified any substance that requires an effluent limitation based on Section 13263.6(a) for the discharge regulated by this Order.
13. 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 aluminum, ammonia, chlorine, cadmium, copper, cyanide, diazinon, and organochlorine pesticides (aldrin and lindane). Effluent limitations for these constituents are included in this Order.
14. **Aluminum**—The Basin Plan contains a narrative water quality objective for toxicity that states in part that “[a]ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life” (narrative toxicity objective). Aquatic habitat is a beneficial use of the receiving stream. Based on information included in analytical laboratory reports submitted by the Discharger, aluminum in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a level necessary to protect aquatic life, and, therefore to violate the Basin Plan’s narrative toxicity objective. U.S. EPA developed National Recommended Ambient Water Quality Criteria for protection of freshwater aquatic life for aluminum. The recommended four-day average (chronic) and one-hour average (acute) criteria for aluminum are 87 µg/l and 750 µg/l, respectively. U.S. EPA recommends that the ambient criteria are protective of the aquatic beneficial uses of receiving waters in lieu of site-specific criteria. The maximum observed effluent aluminum concentration was 250 µg/l. Applying 40 CFR section 122.44(d)(1)(vi)(B), Effluent Limitations for aluminum are included in this Order and are based on U.S. EPA’s Ambient Water Quality Criteria for the protection of the beneficial use of freshwater aquatic

habitat. The receiving stream has been measured to have a low hardness and the receiving water and the effluent have each been measured to have a pH below the minimum Basin Plan water quality objective of 6.5. Both of these conditions are supportive of the applicability of the ambient water quality criteria for aluminum, according to U.S. EPA's development document.

15. ***Ammonia***—Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrite and nitrite 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. Aquatic habitat is a beneficial use of the receiving stream. U.S. EPA has developed Ambient Water Quality Criteria for ammonia. Applying 40 CFR section 122.44(d)(1)(vi)(B), it is appropriate to use U.S. EPA's Ambient National Water Quality Criteria for the Protection of Freshwater Aquatic Life for ammonia, which was developed to be protective of aquatic organisms. Effluent limitations for ammonia are included in this Order, which will vary with pH and temperature, to assure the treatment process adequately nitrifies the waste stream to protect the beneficial uses of the receiving stream and to prevent aquatic toxicity, and are based on the Basin Plan narrative toxicity objective.
16. ***Cadmium***—The CTR includes hardness-dependent standards for the protection of freshwater aquatic life for cadmium. Freshwater aquatic habitat is a beneficial use of the receiving stream. The criteria for cadmium 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 $1.101672 - [0.041838 \times \ln(\text{hardness})]$ for the chronic criteria and $1.136672 - 0.041838 \times \ln(\text{hardness})$ for the acute criteria. Using the worst-case (lowest of receiving water and effluent) measured hardness of 36 mg/l, the corresponding standards are 1.4 µg/l and 1.1 µg/l for the acute and chronic criteria, respectively. Based on information included in analytical laboratory results submitted by the Discharger, cadmium has not been detected in the effluent and all of the reported detection limits for reported sample results were less than the criteria. The maximum observed upstream receiving water cadmium concentration was 31 µg/l. The SIP requires Effluent Limitations for NTR and CTR constituents when the background (upstream receiving water) concentration exceeds an applicable criterion. Effluent Limitations for cadmium are included in this Order and are based on the CTR criterion for the protection of freshwater aquatic life.
17. ***Chlorine***—The Discharger uses chlorine for disinfection of the effluent waste stream. Aquatic habitat is a beneficial use of Reclamation District 777 Drain No. 1. The Basin Plan includes a narrative water quality objective that “[a]ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.” 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 freshwater aquatic life, maximum 1-hour average and 4-day average chlorine concentrations of 0.019 mg/l and 0.011 mg/l, respectively. The use of chlorine as a disinfectant presents a

reasonable potential that it could be discharged in toxic concentrations. Effluent Limitations for chlorine have been included in this Order to protect the receiving stream aquatic life beneficial uses. Effluent Limitations have been established based on the ambient water quality criteria for chlorine.

18. **Copper**—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 criteria for copper. The CTR includes hardness-dependent criteria for the protection of freshwater aquatic life for copper. Freshwater aquatic habitat is a beneficial use of the receiving water. The criteria for copper 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 receiving water and effluent) measured hardness of 36 mg/l, the corresponding criteria are 5.3 µg/l and 3.9 µg/l for the acute and chronic criteria, respectively. The maximum observed effluent copper concentration was 7.1 µg/l. The Effluent Limitations for copper included in this Order are presented in total concentrations, and are based on CTR criteria.
19. **Cyanide**—The NTR includes maximum 1-hour average and 4-day average cyanide concentrations of 22 µg/l and 5.2 µg/l, respectively, for the protection of freshwater aquatic life, saltwater aquatic life, and human health. The freshwater aquatic life standards are protective of both freshwater aquatic life and human health. Freshwater aquatic habitat is a beneficial use of the receiving stream. Based on information included in analytical laboratory results submitted by the Discharger, cyanide has not been detected in the effluent and all of the reported detection limits for reported sample results were less than the criteria. The maximum observed upstream receiving water cyanide concentration was 6.9 µg/l. The SIP requires effluent limitations for NTR and CTR constituents when the background (upstream receiving water) concentration exceeds an applicable criterion. Effluent Limitations for cyanide are included in this Order and are based on the NTR criteria.
20. **Diazinon**—Based on information included in analytical laboratory results submitted by the Discharger, diazinon has been detected at a concentration as high as 0.22 µg/l in the effluent. There are currently no CTR or NTR criteria for this constituent. The Basin Plan contains a narrative toxicity objective that all waters “*be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*” The Basin Plan requires the Regional Board to consider relevant numerical criteria and guidelines developed by other agencies in determining compliance with the narrative toxicity objective (Basin Plan, IV-17.00). In March 2000, the California Department of Fish and Game (DFG) established acute and chronic criteria for these compounds to protect fresh water aquatic life. The acute (one-hour average) and chronic (four-day average) criteria are 0.08 µg/l and 0.05 µg/l, respectively. Based on evaluation of the information provided, the discharge does have the reasonable potential to cause or contribute to an excursion above the narrative toxicity objective in the Basin Plan. Effluent Limitations for diazinon are included in this Order because

the data indicates a reasonable potential to cause or contribute to an exceedance of the Basin Plan narrative toxicity objective.

21. **Organochlorine Pesticides (Group A Pesticides)**—Based on information included in analytical laboratory reports submitted by the Discharger, aldrin was detected at 0.014 µg/l and lindane (gamma BHC) was detected at 0.009 µg/l in the WWTP effluent. Both constituents are chlorinated hydrocarbon pesticides. The Basin Plan requires that no individual pesticides shall be present in concentrations that adversely affect beneficial uses; discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses; total chlorinated hydrocarbon pesticides shall not be present in the water column at detectable concentrations; and pesticide concentrations shall not exceed those allowable by applicable antidegradation policies. The CTR contains a numeric criterion for aldrin of 0.00014 µg/l for freshwaters from which organisms are consumed. The detection of aldrin at 0.014 µg/l and lindane at 0.009 µg/l in the WWTP effluent presents a reasonable potential to exceed the Basin Plan limitations for chlorinated hydrocarbon pesticides and the CTR criterion for aldrin. In addition to aldrin and lindane (gamma BHC), the chlorinated hydrocarbon pesticides include alpha BHC, beta BHC, delta BHC, DDD, DDE, 4,4'-DDT, chlordane, dieldrin, endrin, endrin aldehyde, alpha and beta endosulfan, endosulfan sulfate, heptachlor, heptachlor epoxide, and toxaphene. Effluent Limitations for organochlorine pesticides are included in this Order and are based on the Basin Plan objective of no detectable chlorinated hydrocarbon pesticides. The limitation for chlorinated hydrocarbon pesticides is included based on reasonable potential to violate the water quality objective.
22. **Pathogens**—The beneficial uses of Reclamation District 777 Drain No. 1 include contact recreation uses and irrigation. To protect these beneficial uses, the Regional Board finds that the wastewater must be disinfected and adequately treated to prevent disease. The principal infectious agents (pathogens) that may be present in raw sewage may be classified into three broad groups: bacteria, parasites, and viruses. Tertiary treatment, consisting of chemical coagulation, sedimentation, and filtration, has been found to remove approximately 99.5% of viruses. Filtration is an effective means of reducing viruses and parasites from the waste stream. The wastewater must be treated to tertiary standards (filtered), or equivalent, to protect contact recreational and food crop irrigation uses.

The California Department of Health Services (DHS) has developed reclamation criteria, California Code of Regulations, Title 22, Division 4, Chapter 3 (Title 22), for the reuse of wastewater. Title 22 requires that for spray irrigation of food crops, parks, playgrounds, schoolyards, and other areas of similar public access, wastewater be adequately disinfected, oxidized, coagulated, clarified, and filtered, and that the effluent total coliform levels not exceed 2.2 MPN/100 ml as a 7-day median. Title 22 also requires that recycled water used as a source of water supply for nonrestricted recreational impoundments be disinfected tertiary recycled water that has been subjected to conventional treatment. A nonrestricted recreational impoundment is defined as “...an impoundment of recycled water, in which no limitations are imposed on body-contact water recreational activities.” Title 22 is not directly applicable to

surface waters; however, the Regional Board finds that it is appropriate to apply an equivalent level of treatment to that required by DHS's reclamation criteria because Reclamation District 777 Lateral Drain No. 1, Main Canal, and the Sutter Bypass are used for irrigation of agricultural land and for contact recreation purposes. The stringent disinfection criteria of Title 22 are appropriate since the undiluted effluent may be used for the irrigation of food crops and/or for body-contact water recreation. Coliform organisms are intended as an indicator of the effectiveness of the entire treatment train and the effectiveness of removing other pathogens. The method of treatment is not prescribed by this Order; however, wastewater must be treated to a level equivalent to that recommended by DHS.

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

The application of tertiary treatment processes results in the ability to achieve lower levels for BOD and TSS than the secondary standards currently prescribed; the monthly average BOD and TSS limitations have been revised to 10 mg/l, which is technically based on the capability of a tertiary system.

The establishment of tertiary limitations has not been previously required for this discharge; therefore, a schedule for compliance with the tertiary treatment requirement is included as a Provision in this Order. Alternatives to tertiary treatment, such as land disposal or discharge to a different water body with assimilative capacity, would require modification of the permit.

23. **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.” No reliable dilution is available in the receiving stream, so this Order includes Effluent Limitations for pH at the Basin Plan objective values.
24. Section 2.1 of the SIP provides that: “Based on an existing discharger’s request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.” Section 2.1, further states that compliance schedules may be included in NPDES permits provided that the following justification has been submitted: ...“(a) documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream; (b) documentation of source control measures and/or pollution minimization measures efforts

currently underway or completed; (c) a proposal for additional or future source control measures, pollutant minimization actions, or waste treatment (i.e., facility upgrades); and (d) a demonstration that the proposed schedule is as short as practicable.” This Order requires the Discharger to provide this information. The new water quality based effluent limitations for copper, and cyanide become effective on 1 September 2004 if a compliance schedule justification is not completed and submitted by the Discharger to the Regional Board. Otherwise, final water quality based effluent limitations for copper and cyanide become effective 1 April 2009.

25. As stated in the above Findings, the U.S. EPA adopted the NTR and the CTR, which contains water quality standards applicable to this discharge and the SIP contains requirements for 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.

26. 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 acrolonitrile; hexachlorobenzene; 3, 3'-dichlorobenzidine; 4,4'-DDD; 4,4'-DDE; 4,4'-DDT; aldrin; chlordane; dieldrin; heptachlor; heptachlor epoxide; and toxaphene 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.

27. As stated in *Standard Provisions and Reporting Requirements, For Waste Discharge Requirements, 1 March 1991, General Provisions, No. 13*, this Order prohibits bypass from any portion of the treatment facility. Federal Regulations, 40 CFR 122.41 (m), define “bypass” as the intentional diversion of waste streams from any portion of a treatment facility. This section of the Federal Regulations, 40 CFR 122.41 (m)(4), prohibits bypass unless it is unavoidable to prevent loss of life, personal injury, or severe property damage. In considering the Regional Board’s prohibition of bypasses, the State Water Resources Control Board adopted a precedential decision, Order No. WQO 2002-0015, which cites the Federal Regulations, 40 CFR 122.41(m), as allowing bypass only for essential maintenance to assure efficient operation. In the case of *United States v. City of Toledo, Ohio* (63 F. Supp 2d 834, N.D. Ohio 1999) the Federal Court ruled that “any bypass which occurs because of inadequate plant capacity is unauthorized...to the extent that there are ‘feasible alternatives’, including the construction or installation of additional treatment capacity”.

The Federal Clean Water Act, Section 301, requires that not later than 1 July 1977, publicly owned wastewater treatment works meet effluent limitations based on secondary treatment or any more stringent limitation necessary to meet water quality standards. Federal Regulations, 40 CFR, Part 133, establish the minimum level of effluent quality attainable by secondary treatment for BOD, TSS, and pH. Tertiary treatment requirements for BOD and TSS are based on the technical capability of the process. Biochemical oxygen demand (BOD) is a measure of the amount of oxygen used in the biochemical oxidation of organic matter. The solids content—suspended (TSS) and settleable (SS)—is also an important characteristic of wastewater. The secondary and tertiary treatment standards for BOD and TSS are indicators of the effectiveness of the treatment processes.

The principal infectious agents (pathogens) that may be present in raw sewage may be classified into three broad groups: bacteria, parasites, and viruses. Secondary treatment has been shown to be effective for pathogen removal. For additional pathogen reduction, tertiary treatment, consisting of chemical coagulation, sedimentation, and filtration, has been found to remove approximately 99.5% of viruses. Filtration is an effective means of reducing viruses and parasites from the waste stream.

A wet weather influent wastestream may contain significantly diluted levels of BOD and TSS. A bypassed diluted wastestream may have BOD and TSS levels that meet the secondary or tertiary objectives, either alone or when blended with treated wastewater. However, the bypassed wastestream would not have been treated to reduce pathogens or other individual pollutants. The indicator parameters of BOD and TSS cannot be diluted to a level that may indicate the adequate treatment has occurred as an alternative to providing appropriate treatment.

28. Federal Regulations 40 (CFR) §133 allows for the adjustment of BOD and TSS limits for facilities that provide treatment equivalent to secondary treatment utilizing stabilization ponds as the principal method of treatment. The Discharger's facility uses waste stabilization ponds as the principal treatment process. 40 CFR §133.105(a) and (b) require equivalent to secondary treatment systems to maintain an effluent quality of not more than 45 mg/l as a 30-day average and not more than 65 mg/l as a 7-day average for BOD and TSS. In addition, the 30-day average percent removal (concentration-based) of BOD and TSS is required not to fall below 65 percent. These apparently less stringent standards are based on the fact that ponds grow algae, which results in higher BOD and TSS concentrations. The higher effluent BOD and TSS concentrations from pond treatment systems reflect algal growth rather than a lack of treatment of the domestic wastewater. Under 40 CFR §133.101(g), the Live Oak Wastewater Treatment Plant treatment system is eligible for equivalent to secondary BOD and TSS limitations. 40 CFR §133.103(c) allows further adjustments to the TSS limitations, provided that waste stabilization ponds are the principal process for secondary treatment and operation and maintenance data indicate that the TSS values specified in 40 CFR §133.105 cannot be achieved. Data contained in discharger self-monitoring reports indicate that the Discharger cannot consistently comply with the TSS values specified in 40 CFR §133.105. The limitations may be set at the effluent concentration achieved 90 percent of the time within an appropriate contiguous geographical area by waste stabilization ponds that are achieving a monthly average BOD concentration of 45 mg/l. The nearest known waste stabilization pond system discharging to surface waters that consistently has an effluent BOD quality of better than 45 mg/l as a monthly average is the City of Williams WWTP. The TSS concentration achieved 90 percent of the time at this facility is 70 mg/l. The current permit (Order No. 99-008) requires the Discharger to comply with secondary treatment standards of 30 mg/l and 85% removal as monthly averages for effluent BOD and TSS. 40 CFR §122.44(l)(1) states: "*Except as provided in paragraph (1)(2) of this section when a permit is renewed or reissued, interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under §122.62.)*" Since the time of the current permit's adoption, the clarigester utilized as a treatment unit at the WWTP has broken down and the Discharger's search for replacement parts has been unsuccessful. The solids removal benefits of the clarigester are no longer being realized at the Live Oak WWTP. This constitutes a material and substantial change to the circumstances in place at the time of adoption of the current permit. Effluent Limitations for BOD and TSS based on equivalent to

secondary treatment standards are included in this permit only until 1 April 2009, when the tertiary treatment requirements described in Finding 22 take effect.

29. This Order contains Effluent Limitations based on a tertiary level of treatment, or equivalent, which are necessary to protect the beneficial uses of the receiving water. In accordance with California Water Code, Section 13241, the Board has considered the following:

As stated in the above Findings, the past, present and probable future beneficial uses of the receiving stream include agricultural irrigation, body contact water recreation, warm freshwater aquatic habitat, cold fish migration habitat, cold spawning habitat, and wildlife habitat

The environmental characteristics of the hydrographic unit including the quality of water available will be improved by the requirement to provide tertiary treatment for this wastewater discharge. Tertiary treatment will allow for the reuse of the undiluted wastewater for food crop irrigation and contact recreation activities which would otherwise be unsafe according to recommendations from the California Department of Health Services (DHS). Fishable and swimmable water quality conditions can be reasonably achieved through the coordinated control of all factors which affect water quality in the area.

The economic impact of requiring an increased level of treatment has been considered. State Board staff has estimated that the increased level of treatment will cost approximately \$2.2 million. The current monthly single family, residential sewer user fee is \$41.35 (as of 1 July 2004). This fee is scheduled to increase to \$43.41 on 1 January 2005. The California average monthly domestic sewer user fee is \$20.46. The loss of beneficial uses within downstream waters, without the tertiary treatment requirement, include prohibiting the irrigation of food crops and prohibiting public access for contact recreational purposes, would have a detrimental economic impact. In addition to pathogen removal to protect irrigation and recreation, tertiary treatment may also aid in meeting discharge limitations for other pollutants, such as heavy metals, reducing the need for advanced treatment.

The need to develop housing in the area will be facilitated by improved water quality, which protects the contact recreation and irrigation uses of the receiving water. DHS recommends that, in order to protect the public health, undiluted wastewater effluent must be treated to a tertiary level, for contact recreational and food crop irrigation uses. Without tertiary treatment, the downstream waters could not be safely utilized for contact recreation or the irrigation of food crops.

It is the Regional Board's policy, (Basin Plan, page IV-15.00, Policy 2) to encourage the reuse of wastewater. The Regional Board requires Dischargers to evaluate how reuse or land disposal of wastewater can be optimized. The need to develop and use recycled water is facilitated by providing a tertiary level of wastewater treatment which will allow for a greater variety of uses in accordance with California Code of Regulations, Title 22.

30. As described above, agricultural supply is a beneficial use of the receiving waters, Reclamation District 777 Lateral Drain No. 1, Main Canal, and the Sutter Bypass. Domestic and industrial uses of water result in an increase in the mineral content of the wastewater. The minerals include calcium, sodium sulfate, and other dissolved salts, including chloride. The salinity of wastewater is determined by measuring electrical conductivity (EC) or total dissolved solids (TDS), which are parameters used to describe the suitability of wastewater for irrigation.

To protect agricultural irrigation use, studies have recommended an agricultural water quality goal of 700 $\mu\text{mhos/cm}$ for electrical conductivity. In the Basin Plan, numeric water quality objectives for the protection of beneficial uses have been established for electrical conductivity in the Sacramento River, between the Colusa Basin Drain and the "I" Street Bridge and in the Feather River, from the Fish Barrier Dam at Oroville to the Sacramento River. The discharge to Reclamation District 777 Lateral Drain No. 1 is eventually tributary to the Sacramento River (during normal and high flow conditions) between the Colusa Basin Drain and the "I" Street Bridge and to the Feather River (during high flow conditions only) between the Fish Barrier Dam and the Sacramento River.

Effluent monitoring results submitted by the Discharger in discharger self-monitoring reports include reported effluent concentrations ranging from 80 to 930 $\mu\text{mhos/cm}$, with an average of 790 $\mu\text{mhos/cm}$. Upstream receiving water (R-1) monitoring results ranged from 48 to 930 $\mu\text{mhos/cm}$ upstream and averaged 667 $\mu\text{mhos/cm}$. Downstream receiving water (R-2) concentrations ranged from 8 to 1,200 $\mu\text{mhos/cm}$, with an average of 609 $\mu\text{mhos/cm}$. Pumped agricultural irrigation intakes and discharges located between the point of discharge and the receiving stream monitoring stations (R-1 and R-2) affect the usefulness of these data points by effecting water quality changes not associated with the discharge and occasionally altering flow direction. With the available data, it is not possible to determine whether the discharge causes agriculture irrigation goals to be exceeded in the receiving water. Therefore, this Order contains a Provision for a study with compliance schedule to determine whether electrical conductivity in the receiving water exceeds the agriculture irrigation goals. The Provision requires the Discharger to determine the salinity of the community water supply and to assess possible sources, including a seasonal food processing industry, and source control measures. The Provision allows the Regional Board to reopen the permit if monitoring results indicate Effluent Limitations are necessary.

RECEIVING WATER LIMITATIONS

31. This Order contains Receiving Water Limitations based on the Basin Plan numerical and narrative water quality objectives for Biostimulatory Substances, Chemical Constituents, Color, Dissolved Oxygen, Floating Material, Oil and Grease, pH, Pesticides, Radioactivity, Salinity, Sediment, Settleable Material, Suspended Material, Tastes and Odors, Temperature, Toxicity and Turbidity. The Basin Plan includes numeric water quality objectives for various beneficial uses and water bodies. Numeric Basin Plan objectives that are applicable to this discharge and which have been included as Receiving Water Limitations are:
- a. *Bacteria*—The Basin Plan includes a water quality objective that “[i]n waters designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 ml.” The Sutter Bypass is designated as having a beneficial use of contact recreation. As described in Finding 6.b, the beneficial use of water contact recreation is applicable to Reclamation District 777 Lateral Drain No. 1. A numeric Receiving Water Limitation for bacteria is included in this Order and is based on the Basin Plan objective for bacteria.
 - b. *Dissolved Oxygen*—The Basin Plan includes a water quality objective that “[f]or surface water bodies outside the legal boundaries of the Delta, 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 saturation.” In addition, for water bodies designated as having the beneficial uses of cold freshwater habitat or spawning, reproduction, and/or early development, the Basin Plan includes an objective that the dissolved oxygen concentration not fall below 7.0 mg/l at any time. The Sutter Bypass is designated as having the beneficial uses of warm freshwater habitat and a cold fish migration and spawning habitat. As described in Finding 6.e, the beneficial uses of cold fish migration and spawning habitat are applicable to Reclamation District 777 Lateral Drain No. 1. Numeric Receiving Water Limitations for minimum dissolved oxygen concentration and percent saturation are included in this Order and are based on the Basin Plan objectives.
 - c. *pH*—The Basin Plan includes water quality objectives that the pH “...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 Sutter Bypass is designated as having both COLD and WARM beneficial uses. As described in Finding 6.e, the beneficial uses of cold fish migration and spawning habitat are applicable to Reclamation District 777 Lateral Drain No. 1. The change in pH of 0.5 (standard pH units) is not included as necessary to protect aquatic life in U.S. EPA’s Ambient Criteria for the Protection of Freshwater Aquatic Life as long as pH does not fall below 6.5 or exceed 8.5 units. Therefore, an averaging period of 30 days has been applied to the

Basin Plan receiving water objective for changes in pH. Numeric Receiving Water Limitations for pH are included in this Order and are based on the Basin Plan objectives for pH.

- d. *Temperature*—The Basin Plan includes a water quality objective that “[a]t no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5°F above natural receiving water temperature.” The Sutter Bypass is designated as having both COLD and WARM beneficial uses. As described in Finding 6.e, the beneficial uses of cold fish migration and spawning habitat are applicable to Reclamation District 777 Lateral Drain No. 1. A numeric Receiving Water Limitation for temperature is included in this Order and is based on the Basin Plan objective for temperature.
- e. *Turbidity*—The Basin Plan includes a water quality objective that “[i]ncreases in turbidity attributable to controllable water quality factors shall not exceed the following limits:
- *Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.*
 - *Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.*
 - *Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.*
 - *Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.”*

The discharge from the Live Oak WWTP is a controllable water quality factor. Tertiary wastewater treatment plants are technically capable of achieving an average effluent turbidity of 2 nephelometric turbidity units (NTU). In high quality ephemeral or low-flow streams, the natural turbidity may be less than 5 NTU. The turbidity in Reclamation District 777 Lateral Drain No. 1 is highly variable. Turbidity at these levels is based on antidegradation and is not expected to have any impact on aquatic life. A numeric Receiving Water Limitation for turbidity is included in this Order and is based on the Basin Plan objective for turbidity. An averaging period of 30 days, where the natural upstream turbidity is less than 5 NTU, has been applied to the Receiving Water Limitation.

GROUNDWATER

32. The beneficial uses of the underlying ground water, as identified in the Basin Plan, are municipal and domestic supply, industrial service supply, industrial process supply, and agricultural supply.
33. Basin Plan water quality objectives to protect the beneficial uses of groundwater include numeric objectives and narrative objectives, including objectives for 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 human, plant, animal, or aquatic life. 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 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 municipal and domestic water supply, agricultural supply, or any other beneficial use.
34. 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.
35. The Discharger utilizes aeration lagoons and oxidation ponds. Domestic wastewater contains constituents such as total dissolved solids (TDS), specific conductivity, pathogens, nitrates, organics, metals and oxygen demanding substances (BOD). Percolation from the lagoons and ponds may result in an increase in the concentration of these constituents in groundwater. The increase in the concentration of these constituents in groundwater must be consistent with Resolution 68-16. Any increase in pollutant concentrations in groundwater must be shown to be necessary to allow wastewater utility service necessary to accommodate housing and economic expansion in the area and must be consistent with maximum benefit to the people of the State of California. Some degradation of groundwater by the Discharger is consistent with Resolution 68-16 provided that:
 - a. the degradation is limited in extent;
 - b. the degradation after effective source control, treatment, and control is limited to waste constituents typically encountered in municipal wastewater as specified in the groundwater limitations in this Order;

- c. the Discharger minimizes the degradation by fully implementing, regularly maintaining, and optimally operating best practicable treatment and control (BPTC) measures; and
 - d. the degradation does not result in water quality less than that prescribed in the Basin Plan.
36. 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. Until groundwater monitoring is sufficient, this Order contains Groundwater Limitations that allow groundwater quality to be degraded for certain constituents when compared to background groundwater quality, but not to exceed water quality objectives. If groundwater quality has been degraded by the discharge, the incremental change in pollutant concentration (when compared with background) may not be increased. If groundwater quality has been or may be degraded by the discharge, this Order may be reopened and specific numeric limitations established consistent with Resolution 68-16 and the Basin Plan.
37. 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.
38. This Order requires the Discharger to continue groundwater monitoring and includes a regular schedule of groundwater monitoring in the attached Monitoring and Reporting Program. The groundwater monitoring reports are necessary to evaluate impacts to waters of the State to assure protection of beneficial uses and compliance with Regional Board plans and policies, including Resolution 68-16. Evidence in the record includes effluent monitoring data that indicates the presence of constituents that may degrade groundwater and surface water.

COLLECTION SYSTEM

39. 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. Sanitary sewer overflows are prohibited by this Order. All violations must be reported as required in Standard Provisions. Facilities (such as wet wells, regulated impoundments, tanks, highlines, *etc.*) may be part of a sanitary sewer system and discharges to these facilities are not considered sanitary sewer overflows, provided that the waste is fully contained within these temporary storage facilities.
40. 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 lack of maintenance; blockages due to grease, roots, and debris; sewer line flood damage; manhole structure failures; vandalism; pump station mechanical failures; power outages; stormwater or groundwater inflow/infiltration; insufficient capacity; and contractor-caused blockages.
41. 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 exceedances 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.
42. The Discharger is required to take all necessary steps to adequately maintain and operate its sanitary sewer collection system.

STORMWATER

43. U.S. EPA promulgated Federal Regulations for storm water on 16 November 1990 in 40 CFR Parts 122, 123, and 124. The NPDES Industrial Storm Water Program regulates storm water discharges from municipal sanitary sewer systems. Wastewater Treatment Plants are applicable industries under the stormwater program and are obligated to comply with the Federal Regulations. This Order requires the Discharger to apply for coverage under the General Permit for Discharges of Storm Water Associated with Industrial Activities (State Water Resources Control Board, Water Quality Order No. 97-03-DWQ, NPDES General Permit No. CAS000001).

GENERAL

44. Monitoring is required by this Order for the purposes of assessing compliance with permit limitations and water quality objectives and gathering information to evaluate the need for additional limitations.
45. Section 13267 of the California Water Code states, in part, “(a) A regional board, in establishing...waste discharge requirements... may investigate the quality of any waters of the state within its region” and “(b) (1) In conducting an investigation..., the regional board may require that any person who... discharges... waste...that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports.” The attached Monitoring and Reporting Program is issued pursuant to California Water Code Section 13267. The groundwater monitoring and reporting program required by this Order and the attached Monitoring and Reporting Program are necessary to assure compliance with these waste discharge requirements. The City of Live Oak is responsible for the discharges of waste at the facility subject to this Order.
46. The SIP, Section 2.1, allows compliance schedules to be included in NPDES permits for priority pollutants, provided that: diligent efforts have been made to quantify the pollutant, there is documentation that source control measures are underway, there is a proposed schedule for achieving compliance, and the schedule is as short as practicable. The Discharger has made diligent efforts to quantify the constituents limited in this Order, source control measures (in the form of the sewer use ordinances) are under way, and this Order includes a compliance time schedule for priority pollutants.
47. The Regional Board has considered the information in the attached Fact Sheet in developing the Findings of this Order. The Fact Sheet, Monitoring and Reporting Program No. R5-2004-0096, and Attachments A through F are a part of this Order.
48. The discharge is presently governed by Waste Discharge Requirements Order No. 99-008, adopted by the Regional Board on 30 April 1999.
49. The U.S. Environmental Protection Agency (U.S. EPA) and the Regional Board have classified this discharge as a major discharge.
50. 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.

51. 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.
52. 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.
53. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.
54. This Order shall serve as an NPDES permit pursuant to Section 402 of the CWA, and amendments thereto, and shall take effect upon **1 September 2004**, provided U.S. EPA has no objections.

IT IS HEREBY ORDERED that Order No. 99-008 is rescinded and the City of Live Oak, 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 to surface waters 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.

B. Effluent Limitations—Discharge to Reclamation District 777 Lateral Drain No. 1 (001):

1. Effluent shall not exceed the following limits (from adoption until **31 March 2009**):

<u>Constituents</u>	<u>Units</u>	<u>Average Monthly</u>	<u>Monthly Median</u>	<u>Average Weekly</u>	<u>Average Daily</u>	<u>Instantaneous Maximum</u>
BOD ¹	mg/l	45 ²	--	65 ²	90 ²	--
	lb/day ³	530	--	760	1,100	--
Total Suspended Solids	mg/l	70 ²	--	110 ²	140 ²	--
	lb/day ³	820	--	1,300	1,600	--
Total Coliform Organisms	MPN/100ml	--	23	--	--	500
Settleable Solids	ml/l·hr	0.1	--	--	0.2	--
Organochlorine Pesticides	µg/l	--	--	--	--	ND ⁴

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 1.4 mgd ($x \text{ mg/l} \times 8.345 \times 1.4 \text{ mgd} = y \text{ lbs/day}$)

4 The Non-Detectable (ND) limitation applies to each individual pesticide. No individual pesticide may be present in the discharge at detectable concentrations. The Discharger shall use EPA standard analytical techniques with the lowest possible detectable level for organochlorine pesticides with a maximum acceptable detection level of 0.05 µg/l.

<u>Constituents</u>	<u>Units</u>	<u>Average Monthly</u>	<u>Average 4-Day</u>	<u>Average Daily</u>	<u>Average 1-Hour</u>
Aluminum	µg/l	71	--	140	--
	lbs/day ¹	0.83	--	1.7	--
Ammonia, Total (as N)	mg/l	Attachment B	Attachment C	--	Attachment D
	lbs/day ²	₃	₃	--	₃
Cadmium (total recoverable)	µg/l	Attachment E	--	Attachment E	--
	lbs/day ¹	₄	--	₄	--
Chlorine, Total Residual	mg/l	--	0.01	--	0.02
	lbs/day ²	--	0.13	--	0.22
Diazinon	µg/l	0.04	--	0.08	--
	lbs/day ¹	0.0005	--	0.001	--

1 Based upon a design treatment capacity of 1.4 mgd [$x \text{ µg/l} \times (1 \text{ mg}/1000 \text{ µg}) \times 8.345 \times 1.4 \text{ mgd} = y \text{ lbs/day}$]

2 Based upon a design treatment capacity of 1.4 mgd ($x \text{ mg/l} \times 8.345 \times 1.4 \text{ mgd} = y \text{ lbs/day}$)

3 The mass limit (lb/day) for ammonia shall be equal to the concentration limit (from Attachments) multiplied by the design flow of 1.4 mgd and the unit conversion factor of 8.345 (see footnote 3 for equation).

4 The mass limit (lbs/day) shall be equal to the concentration limit (from corresponding Attachment, for corresponding period) multiplied by the design flow of 1.4 mgd and the unit conversion factor of 8.345 and divided by 1000 µg/l per mg/l (see footnote 1 for equation).

Interim Average Daily Limitations for Priority Pollutants

<u>Constituents</u>	<u>µg/l</u>	<u>lbs/day¹</u>
Copper (total recoverable)	22	0.26
Cyanide (total recoverable)	16	0.19

1 Based upon a design treatment capacity of 1.4 mgd [$x \mu\text{g/l} \times (1 \text{ mg}/1000 \mu\text{g}) \times 8.345 \times 1.4 \text{ mgd} = y \text{ lbs/day}$]

2. The effluent shall not exceed the following limitations (from **1 April 2009** forward):

<u>Constituents</u>	<u>Units</u>	<u>Average Monthly</u>	<u>7-Day Median</u>	<u>Average Weekly</u>	<u>Average Daily</u>	<u>Instantaneous Maximum</u>
BOD ¹	mg/l	10 ²	--	15 ²	20 ²	--
	lbs/day ³	120	--	180	230	--
Total Suspended Solids	mg/l	10 ²	--	15 ²	20 ²	--
	lbs/day	120	--	180	230	--
Total Coliform Organisms	MPN/100 ml	--	2.2	--	--	23 ⁴
Settleable Solids	m//l·hr	0.1	--	--	0.2	--
Organochlorine Pesticides	µg/l	--	--	--	--	ND ⁵
Turbidity	NTU	--	--	--	2	5 ⁶

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 1.4 mgd ($x \text{ mg/l} \times 8.345 \times 1.4 \text{ mgd} = y \text{ lbs/day}$)

4 The total coliform organisms concentration shall not exceed 23 MPN/100 ml more than once in any 30-day period. No sample shall exceed a concentration of 240 MPN/100 ml.

5 The Non-Detectable (ND) limitation applies to each individual pesticide. No individual pesticide may be present in the discharge at detectable concentrations. The Discharger shall use EPA standard analytical techniques with the lowest possible detectable level for organochlorine pesticides with a maximum acceptable detection level of 0.05 µg/l.

6 The turbidity shall not exceed 5 NTU more than 5 percent of the time within a 24-hour period. At no time shall the turbidity exceed 10 NTU.

<u>Constituents</u>	<u>Units</u>	<u>Average Monthly</u>	<u>Average 4-Day</u>	<u>Average Daily</u>	<u>Average 1-Hour</u>
Aluminum ¹	µg/l	71 ²	--	140 ²	--
	lbs/day ³	0.83	--	1.7	--
Ammonia, Total (as N)	mg/l	Attachment B	Attachment C	--	Attachment D
	lbs/day ⁴	5	5	--	5

1 Acid-soluble or total

2 To be ascertained by 24-hour composite

3 Based upon a design treatment capacity of 1.4 mgd [$x \mu\text{g/l} \times (1 \text{ mg}/1000 \mu\text{g}) \times 8.345 \times 1.4 \text{ mgd} = y \text{ lbs/day}$]

4 Based upon a design treatment capacity of 1.4 mgd ($x \text{ mg/l} \times 8.345 \times 1.4 \text{ mgd} = y \text{ lbs/day}$)

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2004-0096
 NPDES NO. CA0079022
 CITY OF LIVE OAK
 WASTEWATER TREATMENT PLANT
 SUTTER COUNTY

<u>Constituents</u>	<u>Units</u>	<u>Average Monthly</u>	<u>Average 4-Day</u>	<u>Average Daily</u>	<u>Average 1-Hour</u>
Cadmium (total recoverable)	µg/l lbs/day ³	Attachment E ² 6	-- --	Attachment E ² 6	-- --
Chlorine, Total Residual	mg/l lbs/day ⁴	-- --	0.01 0.13	-- --	0.02 0.22
Copper (total recoverable)	µg/l lbs/day ³	Attachment F ² 6	-- --	Attachment F ² 6	-- --
Cyanide (total recoverable)	µg/l lbs/day ³	4.3 ² 0.050	-- --	8.5 ² 0.10	-- --
Diazinon	µg/l lbs/day ³	0.04 0.0005	-- --	0.08 0.001	-- --

5 The mass limit (lb/day) for ammonia shall be equal to the concentration limit (from Attachments) multiplied by the design flow of 1.4 mgd and the unit conversion factor of 8.345 (see footnote 3 for equation).

6 The mass limit (lbs/day) shall be equal to the concentration limit (from corresponding Attachment, for corresponding period) multiplied by the design flow of 1.4 mgd and the unit conversion factor of 8.345 and divided by 1000 µg/l per mg/l (see footnote 3 for equation).

3. The arithmetic mean of 20°C BOD (5-day) in effluent samples collected over a monthly period shall not exceed 35 percent of the arithmetic mean of the concentration values for influent samples collected at approximately the same times during the same period (65 percent removal).
4. The arithmetic mean of 20°C BOD (5-day) and of total suspended solids in effluent samples collected over a calendar month 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) by **1 April 2009**.
5. The discharge shall not have a pH less than 6.5 nor greater than 8.5.
6. The average dry weather discharge flow shall not exceed 1.4 million gallons.
7. Wastewater shall be oxidized and disinfected, or equivalent treatment provided.
8. Wastewater shall be oxidized, coagulated, filtered, and disinfected, or equivalent treatment provided by **1 April 2009**.
9. Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

Minimum for any one bioassay - - - - - 70%

Median for any three or more consecutive bioassays - - - - 90%

C. Oxidation Pond and Aeration Lagoon Limitations:

1. Public contact with wastewater shall be precluded through such means as fences, signs, and other acceptable alternatives.
2. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the wastewater treatment and disposal areas.
3. As a means of discerning compliance with Oxidation Pond and Aeration Lagoon Limitations C.2, the dissolved oxygen content in the upper zone (1 foot) of wastewater in ponds shall not be less than 1.0 mg/l.
4. Pond and lagoon freeboard shall never be less than two feet (measured vertically to the lowest point of overflow).
5. Ponds and lagoons shall not have a pH less than 6.5 or greater than 8.5 as a daily average.
6. Ponds shall be managed to prevent breeding of mosquitoes. In particular:
 - a. An erosion control program should assure that small coves and irregularities are not created around the perimeter of the water surface.
 - b. Weeds shall be minimized.
 - c. Dead algae, vegetation, and debris shall not accumulate on the water surface.

D. 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 U.S. 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.

E. 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 Reclamation District 777 Lateral Drain No. 1 or downstream waters:

1. The fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, to exceed a geometric mean of 200 MPN/100 ml or cause more than 10 percent of total samples taken during any 30-day period to exceed 400 MPN/100 ml.
2. Biostimulatory substances that promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.
3. Esthetically undesirable discoloration.
4. 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.
5. Floating material to be present in amounts that cause nuisance or adversely affect beneficial uses.
6. Oils, greases, waxes, or other materials to accumulate in concentrations that cause nuisance, result in a visible film or coating on the water surface or on objects in the water, or otherwise adversely affect beneficial uses.
7. The ambient pH to fall below 6.5, exceed 8.5, or change by more than 0.5 units. A one-month averaging period may be applied when calculating the pH change of 0.5 units.
8. Radionuclides to be present in concentrations 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.

9. Deposition of material that causes nuisance or adversely affects beneficial uses.
10. Taste- or odor-producing substances to impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin or to cause nuisance or adversely affect beneficial uses.
11. The ambient temperature to increase more than 5°F.
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. 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.

When wastewater is treated to a tertiary level (including coagulation) or equivalent, a one-month averaging period may be used when determining compliance with Receiving Water Limitation E.13.a.

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

F. Groundwater Limitations:

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

1. The discharge, in combination with other sources, shall not cause the underlying groundwater to contain waste constituents in concentrations greater than background water quality. Any increase in Total Dissolved Solids (TDS) or Electrical Conductivity (EC) concentrations within the monitoring points, when compared to background, shall not exceed the increase typically caused by the percolation discharge of domestic wastewater, and shall not violate water quality objectives, impact beneficial uses, or

cause pollution or nuisance. For purposes of this limitation, the monitoring points are (define Location(s) near the infiltration area, but still within property owned or controlled by the discharger.)

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

G. 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. **Hydrogeologic Evaluation and Groundwater Monitoring Tasks.** Within **eighteen months** of the commencement of groundwater monitoring, the Discharger shall complete a hydrogeologic investigation within the area affected and potentially affected by the WWTP. 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 water quality. The groundwater quality must be monitored **at least once** 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. The groundwater monitoring network shall include one or more background monitoring wells and a sufficient number of designated monitoring wells to evaluate performance of BPTC measures and compliance with this Order's groundwater limitations. These include monitoring wells immediately downgradient of every treatment, storage, and disposal unit that does or may release waste constituents to groundwater with the exception of wastewater reclamation areas. All wells shall comply with appropriate standards as described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 94-81* (December 1981), and any more stringent standards adopted by the Discharger or county pursuant to CWC Section 13801. The existing well network will be evaluated, and the proposed network should include existing monitoring wells where they will serve to measure compliance or provide other relevant information (e.g., depth to groundwater). The Discharger shall install approved monitoring wells and commence groundwater monitoring in accordance with this Order's Monitoring and Reporting Program. After the first sampling event, the Discharger shall report on its sampling protocol as specified in this Order's Monitoring and Reporting Program (MRP). After **one year of monitoring**, the Discharger shall characterize natural background quality of

monitored constituents in a technical report. If the monitoring shows that any constituent concentrations are increased above background water quality, the Discharger shall submit a technical report describing the evaluation's results and critiquing each evaluated component with respect to BPTC and minimizing the discharge's impact on groundwater quality. Where treatment system deficiencies are documented, the technical report shall provide recommendations for necessary modifications (*e.g.*, new or revised salinity source control measures, WWTP component upgrade and retrofit) to achieve BPTC and identify the source of funding and proposed schedule for modifications for achieving full compliance prior to expiration of this Order. This Order may be reopened and additional groundwater limitations added.

4. There are indications that the discharge may contain constituents that have a reasonable potential to cause or contribute to an exceedance of water quality objectives. The constituents are specifically listed in a technical report requirement issued by the Executive Officer on 10 September 2001 and include NTR, CTR, and additional constituents, which could exceed Basin Plan numeric or narrative water quality objectives. The Discharger shall comply with the following time schedule in conducting a study of the potential effect(s) of these constituents in surface waters:

<u>Task</u>	<u>Compliance Date</u>
Submit Study Report	1 June 2005
Submit Study Report for dioxins	1 March 2007

This Order requires the Discharger to comply with Effluent Limitations associated with tertiary, or equivalent, treatment. In addition to pathogen removal to protect irrigation and recreation uses, tertiary treatment may also aid in the removal of other constituents, such as heavy metals, thereby reducing the need for advanced treatment.

This Order is intended to be consistent with the requirements of the 10 September 2001 technical report and the 27 December 2001 revision. With the exception of the compliance dates and number of samples, the technical report requirements shall take precedence in resolving any conflicts. Due to planned improvements at the WWTP, the study requirements included in the 10 September 2001 letter were temporarily waived. The planned improvements have now been constructed and completed. The Discharger shall collect samples and complete analyses to supplement existing data sets for a total of six data sets for those constituents required to be monitored monthly and two data sets for those constituents required to be monitored quarterly; dioxin monitoring frequencies shall be those required in the 10 September 2001 letter. The Discharger shall submit to the Regional Board on or before each compliance due date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with

the time schedule.

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

5. ***Salinity Study***—There are indications that the discharge may contain constituents that have a reasonable potential to cause or contribute to an exceedance of water quality standards for electrical conductivity (a measure of salinity). The Discharger shall comply with the following time schedule in conducting a study of the potential effects of these constituents in surface waters:

<u>Task</u>	<u>Compliance Date</u>
Begin Study	28 February 2005
Submit Study Report	30 June 2006

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

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

6. ***Sanitary Sewer System Operation, Maintenance and Overflow Prevention***—The Discharger shall maintain all portions of the wastewater collection system to assure compliance with this Order. Collection system overflows and/or discharges are prohibited by this Order. All violations of this Order must be reported as specified in Standard Provisions and the public shall be notified, in coordination with the Health Department, in areas that have been contaminated with sewage. All parties with a reasonable potential for exposure to a sewage overflow event shall be notified.
7. 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 full-time. Permit violations or system upsets can go undetected during unstaffed periods. The Discharger is required to establish an electronic system for operator notification for continuous recording device alarms. For existing continuous monitoring systems, the electronic notification system shall be installed **within six months of adoption** of this permit. For systems installed following

permit adoption, the notification system shall be installed simultaneously.

8. The Discharger shall submit a Notice of Intent to Comply with the Terms of the General Permit for Discharges of Storm Water Associated with Industrial Activities (State Water Resources Control Board, Water Quality Order No. 97-03-DWQ, NPDES General Permit No. CAS000001) to the State Water Resources Control Board no later than **15 August 2004**.
9. The Discharger shall conduct the chronic 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.
10. The Discharger shall comply with the following time schedule to assure compliance with the Effluent Limitations contained in B.2 of this Order:

<u>Task</u>	<u>Compliance Date</u>	<u>Report Due Date</u>
Submit Annual Status Report		1 July, annually
Submit Workplan/Time Schedule		1 April 2005
Full Compliance	1 April 2009	

Available results from the study required by Provision G.4 should be considered by the design engineer when planning and designing plant improvements.

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.

11. The Discharger must submit and utilize U.S. EPA test methods and quantitation limits to achieve quantitation 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 U.S. EPA test methods shall be reported.

12. The interim limitations in this Order are based on the current treatment plant performance and have been established as described in Finding 25. Interim limitations have been established since compliance with NTR- and CTR-based Effluent Limitations cannot be achieved by the existing discharge. The interim Effluent Limitations contained in B.1 establish enforceable mass and concentration ceilings until compliance with the final Effluent Limitations contained in B.2 (required by **1 April 2009**) can be achieved.
13. 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.
14. 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."
15. The Discharger shall comply with Monitoring and Reporting Program No. R5-2004-0096, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

When requested by U.S. EPA, 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.

16. Minimum detection levels for monitoring required by this Order shall, unless impracticable, be adequate to demonstrate compliance with permit limitations.
17. This Order shall serve as an NPDES permit pursuant to Section 402 of the CWA, and amendments thereto, and shall take effect on **1 September 2004**, provided U.S. EPA has no objections.
18. **Copper and Cyanide Compliance Schedule:** This Order contains Effluent Limitations based on water quality criteria contained in the CTR for copper and cyanide. By **10 September 2004**, the Discharger shall complete and submit a compliance schedule justification for copper and cyanide. The compliance schedule justification shall include all items specified in Paragraph 3, items (a) through (d), of Section 2.1 of the SIP. The new water quality based effluent limitations for copper and cyanide become effective on **1 October 2004** 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 copper and cyanide required by this Order shall become effective on **1 April 2009**. As this compliance schedule is greater than one year, the Discharger shall submit semi-annual progress reports on **15 January and 15 July** of each year until the Discharger achieves compliance with the final water quality based effluent limitations for copper and cyanide.

19. This Order expires on **1 July 2009** 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.
20. 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.
21. The Discharger shall implement, as more completely set forth in 40 CFR 403.5, the legal authorities, programs, and controls necessary to ensure that indirect discharges do not introduce pollutants into the sewerage system that, either alone or in conjunction with a discharge or discharges from other sources:
- a. Flow through the system to the receiving water in quantities or concentrations that cause a violation of this Order, or
 - b. Inhibit or disrupt treatment processes, treatment system operations, or sludge processes, use, or disposal and either cause a violation of this Order or prevent sludge use or disposal in accordance with this Order.
22. 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).
23. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office.

To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, address and telephone number of the persons responsible for contact with the Regional 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 9 July 2004.

THOMAS R. PINKOS, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2004-0096

NPDES NO. CA0079022

FOR

CITY OF LIVE OAK
WASTEWATER TREATMENT PLANT
SUTTER COUNTY

This Monitoring and Reporting Program is issued pursuant to California Water Code Section 13267 and 13383. 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.

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

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:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
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 ²
Flow	mgd	Meter	Continuous

-
- 1 The BOD and TSS samples shall be flow-proportional composite samples collected on the same day as the effluent samples.
 - 2 The continuous monitoring system, or functional equivalent, shall be operational no later than **1 April 2009**. Until that time, grab samples shall be collected and analyzed daily.

**EFFLUENT MONITORING OF DISCHARGE TO
 RECLAMATION DISTRICT 777 LATERAL DRAIN NO. 1**

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

Effluent monitoring shall include at least the following:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Flow	mgd	Meter	Continuous
Total Residual Chlorine	mg/l, lbs/day	Meter	Continuous ¹
pH	Number	Meter	Continuous ¹
Turbidity	NTU	Meter	Continuous ¹
Temperature	°F	Grab	5 Times Weekly
Electrical Conductivity @ 25°C	µmhos/cm	Grab	5 Times Weekly
Settleable Solids	m//l	24-hr Composite ²	5 Times Weekly
Total Coliform Organisms ³	MPN/100 ml	Grab	3 Times Weekly
20°C BOD ₅	mg/l, lbs/day	24-hr Composite ²	3 Times Weekly
Total Suspended Solids	mg/l, lbs/day	24-hr Composite ²	3 Times Weekly
Ammonia, Total (as N) ^{4, 5, 6, 7}	mg/l, lbs/day	Grab	Twice Weekly
Hardness (as CaCO ₃)	mg/l	24-hr Composite ²	Monthly ⁸
Total Dissolved Solids	mg/l, lbs/day	Grab	Monthly
Aluminum ^{6, 9}	µg/l, lbs/day	24-hr Composite ²	Monthly

-
- 1 The continuous monitoring system, or functional equivalent, shall be operational no later than **1 April 2009**. Until that time, grab samples shall be collected and analyzed daily.
 - 2 These samples shall be flow-proportional composite samples. Samples collected from the outlet structure of ponds will be considered adequately composited.
 - 3 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.
 - 4 Report as total ammonia.
 - 5 Concurrent with biotoxicity monitoring.
 - 6 In reporting lbs/day, the Discharger shall report both the lbs/day discharged and the calculated lbs/day limitation.
 - 7 Temperature and pH shall be recorded at the time of ammonia sample collection.
 - 8 Concurrent with metals sampling.

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Copper (total recoverable) ⁶	µg/l, lbs/day	24-hr Composite ²	Monthly
Cyanide (total recoverable)	µg/l, lbs/day	24-hr Composite ²	Monthly
Diazinon ⁶	µg/l, lbs/day	24-hr Composite ²	Monthly
Mercury (total recoverable)	µg/l, lbs/day	Grab	Monthly
Organochlorine Pesticides ^{6,10}	µg/l, lbs/day	24-hr Composite ²	Every Other Month
Acute Toxicity ^{11,12}	% Survival	Grab	Quarterly
Cadmium (total recoverable) ⁶	µg/l, lbs/day	24-hr Composite ²	Quarterly

- 9 Acid-soluble or total. Aluminum samples may be analyzed using the acid-soluble method described in U.S. EPA's *Ambient Water Quality Criteria for Aluminum – 1988* [EPA 440/5-86-008], with the modification that an inductively coupled plasma (ICP)/mass spectrometry analysis be substituted for the ICP/atomic emission spectrometric analysis.
- 10 All peaks are to be reported, along with any explanation provided by the laboratory.
- 11 The acute bioassay samples shall be analyzed using EPA/821-R-02-012, Fifth Edition, or later amendment with Regional Board staff approval. Temperature and pH shall be recorded at the time of bioassay sample collection. Test species shall be fathead minnows (*Pimephales promelas*), with no pH adjustment unless approved by the Executive Officer following adoption of this Order.
- 12 Concurrent with ammonia monitoring.

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

RECEIVING WATER MONITORING

All receiving water samples shall be grab samples. Receiving water monitoring shall be conducted when discharging to Reclamation District 777 Lateral Drain No. 1 and shall include at least the following:

<u>Station</u>	<u>Description</u>
R-1	Reclamation District 777 Lateral Drain No.1, as far as possible upstream ¹ from the point of discharge while still being below the first upstream agricultural discharge, but no more than 50 feet upstream
R-2	Reclamation District 777 Lateral Drain No. 1, as far as possible downstream from the point of discharge while still being above the first downstream agricultural discharge, but no more than 200 feet downstream

¹ Upstream is the direction from the outfall that is upstream when flow direction is unaffected by pumping.

MONITORING AND REPORTING PROGRAM NO. R5-2004-0096
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 CITY OF LIVE OAK
 WASTEWATER TREATMENT PLANT
 SUTTER COUNTY

<u>Constituents</u>	<u>Units</u>	<u>Station</u>	<u>Sampling Frequency</u>
Dissolved Oxygen ²	mg/l ³ % saturation ⁴	R-1, R-2	Weekly
pH ²	Number	R-1, R-2	Weekly
Turbidity ²	NTU	R-1, R-2	Weekly
Temperature ²	°F (°C)	R-1, R-2	Weekly
Electrical Conductivity @25°C ²	µmhos/cm	R-1, R-2	Weekly
Fecal Coliform Organisms	MPN/100 ml	R-1, R-2	Quarterly
Radionuclides	pCi/l ⁵	R-1, R-2	Annually
Hardness (as CaCO ₃)	mg/l	R-1, R-2	Monthly ⁶
Distance from Discharge Point	feet	R-1, R-2	Weekly

-
- 2 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 WWTP.
 - 3 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.
 - 4 Report both percent saturation and saturation concentration.
 - 5 pCi/l = picocuries per liter
 - 6 Samples shall be collected on the same date as the effluent metals and priority pollutant samples.

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by Stations R-1 and R-2. Attention shall be given to the presence or absence of:

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

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

POND/LAGOON MONITORING

Pond/lagoon monitoring shall be conducted when water is present in the pond(s)/lagoon(s). All pond/lagoon samples shall be grab samples. Pond/lagoon monitoring shall, at a minimum, consist of the following:

<u>Constituents</u>	<u>Units</u>	<u>Sampling Frequency</u>
Freeboard	feet ¹	Weekly
Dissolved Oxygen ²	mg/l	Weekly
Odors	--	Weekly
pH ²	pH units	Weekly
Electrical Conductivity @25°C ²	µmhos/cm	Weekly

-
- 1 To be measured vertically to the lowest point of overflow
 - 2 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 WWTP.

THREE SPECIES CHRONIC TOXICITY MONITORING

Chronic toxicity monitoring shall be conducted to determine whether the effluent is contributing toxicity to the receiving water. The testing shall be conducted as specified in EPA/821-R-02-013. Chronic toxicity samples shall be collected from the effluent of the wastewater treatment facility when discharging to Reclamation District 777 Lateral Drain No. 1, after the last unit process, prior to its entering the receiving stream. Twenty-four hour composite samples shall be representative of the volume and quality of the discharge. Time of collection of samples shall be recorded. Control waters shall be obtained immediately upstream of the discharge from an area unaffected by the discharge in the receiving waters. The sensitivity of the test organisms to a reference toxicant shall be determined concurrently with each bioassay and reported with the test results. Monthly laboratory reference toxicant tests may be substituted. Both the reference toxicant and effluent test must meet all test acceptability criteria as specified in the chronic manual. If the test acceptability criteria are not achieved, then the Discharger must re-sample and re-test within 14 days. Chronic toxicity monitoring shall include the following:

Species: *Pimephales promelas* (larval stage), *Ceriodaphnia dubia*, and *Selenastrum capricornutum*

Frequency: Monitoring shall be conducted once per quarter, four quarters per year.

Dilution: 100% effluent

GROUNDWATER MONITORING

Groundwater grab samples shall be collected from all groundwater monitoring wells. Prior to sampling, the wells should be pumped until the temperature, specific conductivity, and pH have stabilized to ensure representative samples. Groundwater monitoring shall include at least the following:

<u>Constituents</u>	<u>Units</u>	<u>Sampling Frequency</u>
Depth to Groundwater ¹	feet	Quarterly
Groundwater Elevation ¹	feet	Quarterly
pH	--	Quarterly
Electrical Conductivity at 25°C	µmhos/cm	Quarterly
Total Kjeldahl Nitrogen (as N)	mg/l	Quarterly
Total Coliform Organisms	MPN/100 ml	Quarterly
Priority Pollutants ^{2,3}	µg/l	Quarterly ⁴

- 1 The groundwater elevation shall be used to calculate the direction and gradient of groundwater flow. Elevations shall be measured to the nearest one-hundredth of a foot from mean sea level. The groundwater elevation shall be measured prior to purging the wells.
- 2 All peaks are to be reported, along with any explanation provided by the laboratory.
- 3 Priority Pollutants are U.S. EPA priority toxic pollutants and consist of the constituents listed in the most recent National Toxics Rule and California Toxics Rule.
- 4 Priority Pollutants must be monitored at least once during the life of the permit in addition to the monitoring required under Provision G.3 of this Order.

SLUDGE MONITORING

A composite sample of sludge shall be collected when sludge is removed from the ponds for disposal 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.

Upon removal of sludge, the Discharger shall submit 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:

<u>Constituents</u>	<u>Units</u>	<u>Sampling Frequency</u>
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 WWTP (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.*

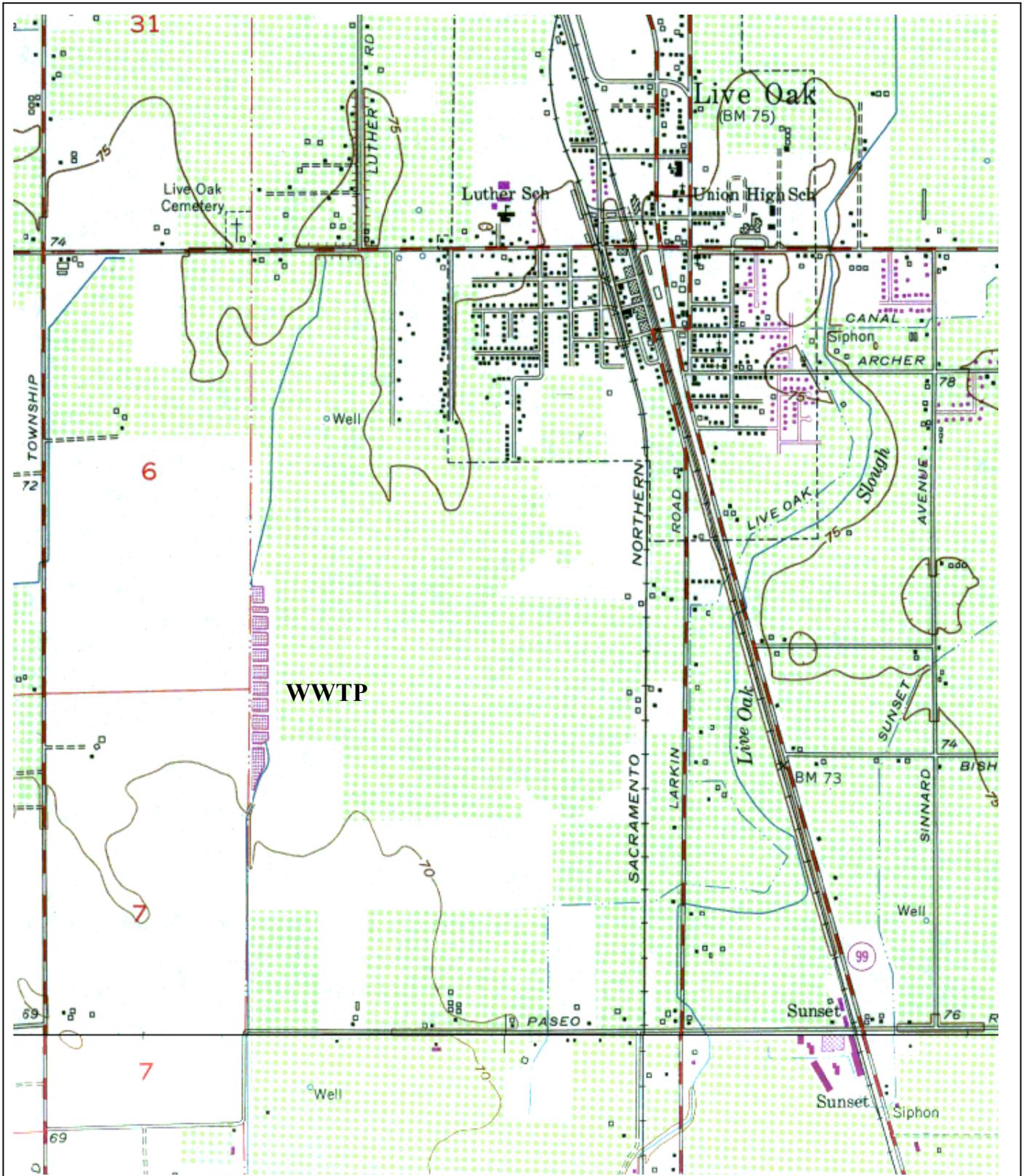
The Discharger may also be requested to submit an annual report to the Regional Board with both tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the compliance record. If violations have occurred, 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

9 July 2004
(Date)



Drawing Reference:

GRIDLEY
 U.S.G.S TOPOGRAPHIC MAP
 7.5 MINUTE QUADRANGLE
 Photorevised 1973
 Not to scale

SITE LOCATION MAP

CITY OF LIVE OAK
 WASTEWATER TREATMENT PLANT
 SUTTER COUNTY



**Temperature- and pH-Dependent Effluent Limits for Ammonia
 Criterion Continuous Concentration, Maximum Average Monthly Concentration**

Ammonia Concentration Limitation (mg N/l)										
Temperature, °C (°F)										
pH	0 (32)	14 (57)	16 (61)	18 (64)	20 (68)	22 (72)	24 (75)	26 (79)	28 (82)	30 (86)
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

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

Where: CCC = criteria continuous concentration
 T = temperature in degrees Celsius (°C)

**Temperature- and pH-Dependent Effluent Limits for Ammonia
 Maximum 4-day Average**

Ammonia Concentration Limitation (mg N/l)										
Temperature, °C (°F)										
pH	0 (32)	14 (57)	16 (61)	18 (64)	20 (68)	22 (72)	24 (75)	26 (79)	28 (82)	30 (86)
6.5	16.7	16.7	15.1	13.3	11.8	10.3	9.04	7.95	6.99	6.14
6.6	16.4	16.4	14.9	13.1	11.5	10.1	8.91	7.83	6.88	6.05
6.7	16.1	16.1	14.6	12.9	11.3	9.94	8.74	7.68	6.75	5.94
6.8	15.7	15.7	14.3	12.8	11.1	9.71	8.54	7.51	6.60	5.80
6.9	15.3	15.3	13.9	12.2	10.7	9.44	8.30	7.30	6.41	5.64
7.0	14.8	14.8	13.4	11.8	10.4	9.12	8.02	7.05	6.19	5.45
7.1	14.2	14.2	12.9	11.3	9.95	8.75	7.69	6.76	5.94	5.22
7.2	13.5	13.5	12.3	10.8	9.46	8.32	7.31	6.43	5.65	4.97
7.3	12.7	12.7	11.5	10.1	8.91	7.84	6.89	6.05	5.32	4.68
7.4	11.8	11.8	10.8	9.46	8.31	7.31	6.42	5.65	4.96	4.36
7.5	10.9	10.9	9.92	8.72	7.66	6.74	5.92	5.20	4.57	4.02
7.6	9.94	9.94	9.03	7.94	6.98	6.14	5.39	4.74	4.17	3.66
7.7	8.95	8.95	8.13	7.15	6.28	5.52	4.85	4.27	3.75	3.30
7.8	7.96	7.96	7.23	6.36	5.59	4.91	4.32	3.79	3.34	2.93
7.9	6.99	6.99	6.36	5.59	4.91	4.32	3.80	3.34	2.93	2.58
8.0	6.08	6.08	5.53	4.86	4.27	3.76	3.30	2.90	2.55	2.24
8.1	5.24	5.24	4.77	4.19	3.68	3.24	2.85	2.50	2.20	1.93
8.2	4.48	4.48	4.07	3.58	3.15	2.77	2.43	2.14	1.88	1.65
8.3	3.81	3.81	3.46	3.04	2.68	2.35	2.07	1.82	1.60	1.40
8.4	3.22	3.22	2.93	2.58	2.26	1.99	1.75	1.54	1.35	1.19
8.5	2.72	2.72	2.48	2.18	1.91	1.68	1.48	1.30	1.14	1.00
8.6	2.30	2.30	2.09	1.84	1.61	1.42	1.25	1.10	0.964	0.848
8.7	1.95	1.95	1.77	1.55	1.37	1.20	1.06	0.928	0.816	0.717
8.8	1.65	1.65	1.50	1.32	1.16	1.02	0.897	0.788	0.693	0.609
8.9	1.41	1.41	1.28	1.13	0.992	0.872	0.766	0.674	0.592	0.520
9.0	1.22	1.22	1.11	0.971	0.854	0.751	0.660	0.580	0.510	0.448

$$2.5CCC = 2.5 \times \left(\frac{0.0577}{1 + 10^{7.688 - pH}} + \frac{2.487}{1 + 10^{pH - 7.688}} \right) \times MIN \left(2.85, 1.45 \cdot 10^{0.028(25 - T)} \right)$$

Where: CCC = criteria continuous concentration
 T = temperature in degrees Celsius (°C)

pH-Dependent Effluent Limits for Ammonia
Criterion Maximum Concentration, Maximum 1-hour Average

pH	Ammonia Concentration Limit (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
8.6	1.77
8.7	1.47
8.8	1.23
8.9	1.04
9.0	0.885

$$CMC_{salmonids\ present} = \left(\frac{0.275}{1 + 10^{7.204 - pH}} + \frac{39.0}{1 + 10^{pH - 7.204}} \right)$$

Where: CMC = criteria maximum concentration

**Hardness-Dependent Effluent Limitations for Cadmium
 (expressed as total recoverable metal)**

Hardness ¹ (mg/l as CaCO ₃)	AMEL Average Monthly (µg/l)	MDEL Average Daily (µg/l)	Hardness ¹ (mg/l as CaCO ₃)	AMEL Average Monthly (µg/l)	MDEL Average Daily (µg/l)
<25	<i>Calc.</i>	<i>Calc.</i>	180	3.2	6.4
25	0.47	0.95	190	3.3	6.7
30	0.58	1.2	200	3.5	7.0
35	0.69	1.4	210	3.6	7.2
40	0.80	1.6	220	3.7	7.5
45	0.91	1.8	230	3.9	7.8
50	1.0	2.1	240	4.0	8.0
55	1.1	2.3	250	4.1	8.3
60	1.3	2.5	260	4.3	8.6
65	1.4	2.8	270	4.4	8.8
70	1.5	3.0	280	4.5	9.1
75	1.6	3.2	290	4.7	9.3
80	1.7	3.4	300	4.8	9.6
85	1.8	3.6	310	4.9	9.8
90	1.9	3.7	320	5.0	10
95	1.9	3.9	330	5.1	10
100	2.0	4.0	340	5.3	11
110	2.2	4.4	350	5.4	11
120	2.3	4.7	360	5.5	11
130	2.5	5.0	370	5.6	11
140	2.6	5.3	380	5.8	12
150	2.8	5.6	390	5.9	12
160	2.9	5.8	400	6.0	12
170	3.1	6.1	>400	6.0	6.4

$$CCC = e^{[0.7852 \ln(\text{hardness}) - 2.715]} \quad AMEL = 1.55[\min(0.321CMC, 0.527CCC)]$$

$$CMC = e^{[1.128 \ln(\text{hardness}) - 3.6867]} \quad MDEL = 3.11[\min(0.321CMC, 0.527CCC)]$$

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

1 The Discharger shall sample for hardness at the same time as the metal listed in the above table and, in calculating the applicable limitation, the Discharger shall use the R-2 hardness result for a sample collected on the same date.

**Hardness-Dependent Effluent Limitations for Copper
 (expressed as total recoverable metal)**

Hardness ¹ (mg/l as CaCO ₃)	AMEL Average Monthly (µg/l)	MDEL Average Daily (µg/l)	Hardness ¹ (mg/l as CaCO ₃)	AMEL Average Monthly (µg/l)	MDEL Average Daily (µg/l)
<25	<i>Calc.</i>	<i>Calc.</i>	180	12	24
25	1.9	3.8	190	13	26
30	2.2	4.5	200	13	27
35	2.6	5.2	210	14	28
40	2.9	5.9	220	15	29
45	3.3	6.6	230	15	31
50	3.6	7.3	240	16	32
55	4.0	8.0	250	17	33
60	4.3	8.7	260	17	34
65	4.7	9.3	270	18	36
70	5.0	10	280	18	37
75	5.3	11	290	19	38
80	5.7	11	300	20	39
85	6.0	12	310	20	40
90	6.3	13	320	21	41
95	6.6	13	330	21	43
100	7.0	14	340	22	44
110	7.6	15	350	22	45
120	8.3	17	360	23	46
130	8.9	18	370	23	47
140	9.6	19	380	24	48
150	10	21	390	24	49
160	11	22	400	25	50
170	12	23	>400	25	24

$$CCC = e^{[0.8545 \ln(\text{hardness}) - 1.702]} \quad AMEL = 1.55[\min(0.321CMC, 0.527CCC)]$$

$$CMC = e^{[0.9422 \ln(\text{hardness}) - 1.700]} \quad MDEL = 3.11[\min(0.321CMC, 0.527CCC)]$$

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

1 The Discharger shall sample for hardness at the same time as the metal listed in the above table and, in calculating the applicable limitation, the Discharger shall use the R-2 hardness result for a sample collected on the same date.

FACT SHEET

ORDER NO. R5-2004-0096
CITY OF LIVE OAK
WASTEWATER TREATMENT PLANT
SUTTER COUNTY
NPDES NO. CA0079022

SCOPE OF PERMIT

This renewed Order regulates the discharge of up to 1.4 million gallons per day (mgd), design average dry weather flow (ADWF), of effluent from the Live Oak Wastewater Treatment Plant (WWTP). 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 City of Live Oak (Discharger) provides sewerage service for the City of Live Oak and serves a population of approximately 8,000. The WWTP design average dry weather flow capacity is 1.4 mgd. The treatment system consists of aeration lagoons, oxidation ponds, disinfection by chlorination, and dechlorination. Treated municipal and industrial wastewater is discharged to Reclamation District 777 Lateral Drain No. 1.

RECEIVING WATER BENEFICIAL USES AND ASSIMILATIVE CAPACITY

The receiving stream is Reclamation District 777 Lateral Drain No. 1, which is tributary to Main Canal, thence the Sutter Bypass. Based on the available information, the worst-case dilution is assumed to be zero to provide protection for the receiving water beneficial uses. The impact of assuming zero assimilative capacity within the receiving water is that discharge limitations are end-of-pipe limits with no allowance for dilution within the receiving water.

The Basin Plan, at page II-2.00, states: “*Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams.*” The Basin Plan does not specifically identify beneficial uses for Reclamation District 777 Lateral Drain No. 1, but the Basin Plan does identify present and potential uses for the Sutter Bypass, to which Reclamation District 777 Lateral Drain No. 1, via Main Canal, is tributary.

The Basin Plan identifies the following beneficial uses for the Sutter Bypass: agricultural irrigation, body contact water recreation, warm freshwater aquatic habitat, cold fish migration habitat, cold spawning habitat, and wildlife habitat. Other beneficial uses identified in the Basin Plan apply to the Sutter Bypass, including groundwater recharge and freshwater replenishment.

State Water Resources Control Board Resolution No. 88-63 “Sources of Drinking Water”, incorporated into the Basin Plan pursuant to Regional Board Resolution 89-056, provides that “*All surface and ground waters of the State are considered suitable, or potentially suitable, for municipal or domestic water supply and should be so designated by the Regional Boards with the exception of: ...2.b. The*

water is in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters...”. Although originally a natural water body, Reclamation District 777 Lateral Drain No. 1 was channelized for the purpose of conveying agricultural drainage waters. Therefore, Reclamation District 777 Lateral Drain No.1 could likely meet the criteria for a municipal exemption under Resolution 88-63.

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

EFFLUENT LIMITATIONS AND REASONABLE POTENTIAL

The City of Live Oak conducted monitoring for priority and non-priority pollutants. The analytical results of two comprehensive effluent and two comprehensive receiving water sampling events were submitted to the Regional Board. The results of these sampling events were used in developing Order No.R5-2004-0096. Detectable results from these analyses are summarized in Table 1 (below). Effluent limitations are included in the Order to protect the beneficial uses of the receiving stream and to ensure that the discharge complies with the Basin Plan objective that toxic substances not be discharged in toxic amounts. Unless otherwise noted, all mass limitations in Order No. R5-2004-0096 were calculated by multiplying the concentration limitation by the design flow and the appropriate unit conversion factors.

Reasonable potential (RP) was determined by calculating the projected MEC (maximum effluent concentration) for each constituent and comparing it to applicable water quality criteria; if a criterion was exceeded, the discharge was determined to have reasonable potential to exceed a water quality objective for that constituent. The projected MEC (maximum effluent concentration) is determined by multiplying the observed MEC (the maximum detected concentration) by a factor that accounts for statistical variation. The multiplying factor is determined (for 99% confidence level and 99% probability basis) using the number of results available and the coefficient of variation (standard deviation divided by the mean) of the sample results. In accordance with the SIP, non-detect results were counted as one-half the detection level when calculating the mean. For all constituents for which the source of the applicable water quality standard is the CTR or NTR, the multiplying factor is 1. Reasonable potential evaluation was based on the methods used in the SIP and the *U.S. EPA Technical Support Document for Water Quality-Based Toxics Control* [EPA/505/2-90-001].

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

Calculations for Effluent Limitations

In calculating maximum effluent limitations, the effluent concentration allowances were set equal to the criteria/standards/objectives.

$$ECA_{chronic} = CCC$$

$$ECA_{acute} = CMC$$

$$ECA_{HH} = HH$$

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

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

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

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

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

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

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

Constituents	28 Mar 2002			2 July 2002			28 Jan 2003		11 Feb 2003		21 Oct 2003	
	R-1	R-2	Blank	R-1	R-2	Blank	Effluent	Blank	Effluent	Blank	Effluent	Blank
Acetone	ND	3.2 ¹	ND	5.6 ¹	5.3 ¹	ND	--	--	ND	ND	3.1 ¹	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	--	--	ND	ND	0.45 ¹	ND
Chloroform	ND	0.11 ¹	ND	1.7	1.6	ND	--	--	0.56	ND	4.1	ND
Chloromethane	0.15 ^{1,2}	0.20 ^{1,2}	0.206 ¹	ND	ND	ND	--	--	ND	ND	0.14 ¹	ND
Dichlorobromomethane	ND	ND	ND	ND	ND	ND	--	--	ND	ND	0.62	ND
Dichloromethane	ND	ND	0.0621 ¹	0.16 ¹	0.15 ¹	ND	--	--	ND	0.108 ¹	0.27 ¹	ND
Naphthalene	ND	ND	ND	0.35 ^{1,3}	ND	ND	ND	0.13	ND	0.115 ¹	ND	0.129 ¹
Toluene	ND	0.12 ¹	ND	ND	ND	ND	--	--	1.5	ND	ND	ND
Methyl-tert-butyl ether	0.39 ¹	0.17 ¹	ND	ND	ND	ND	--	--	ND	ND	ND	ND
<i>m,p</i> -Xylene	ND	ND	ND	0.21 ¹	ND	ND	--	--	ND	ND	ND	ND
Bis (2-chloroisopropyl) ether	ND ⁴	ND ⁴	ND ⁴	ND	ND	--	ND	--	--	--	2 ¹	ND
Bis (2-ethylhexyl) phthalate	ND ⁴	ND ⁴	ND ⁴	ND	ND	--	6 ⁵	--	--	--	ND	ND
Fluoranthene	ND ⁶	ND ⁶	ND	ND	0.35	ND	ND	ND	--	--	ND	ND
Aluminum	84	210	ND	1300	320	ND	--	--	250	ND	110	ND
Antimony	0.72 ¹	ND	ND	0.98 ¹	ND	ND	--	--	0.15 ¹	ND	0.40 ¹	ND
Arsenic	6.9	13	ND	14	22	0.393 ¹	--	--	8.3	ND	16	ND
Barium	98	87	ND	390	73	ND	--	--	68	ND	57	ND
Cadmium	ND	ND	ND	31	0.68 ^{1,2}	0.445 ¹	--	--	ND	ND	ND	ND
Chromium (total)	1.0 ^{1,2}	1.3 ^{1,2}	4.20 ¹	2.3 ¹	ND	ND	--	--	2.4 ^{1,2}	2.52 ¹	1.6 ^{1,2}	2.28 ¹
Copper	2.3 ^{1,2}	5.7 ^{1,2}	0.803 ¹	6.2 ¹	ND	ND	--	--	7.1 ^{1,2}	2.82 ¹	5.3 ¹	ND
Cyanide	ND	ND	ND	6.9	ND	ND	--	--	ND	ND	ND	ND
Fluoride	150	160	ND	160	140	ND	--	--	280	ND	190	ND
Iron	230	370	ND	2000	710	ND	--	--	250	ND	130	ND
Lead	ND	0.36 ¹	ND	0.52 ¹	ND	ND	--	--	ND	ND	ND	ND
Mercury	0.00135	0.00319	ND	0.0115	0.00801	--	--	--	ND	ND	--	--
Manganese	270	360	ND	270	55	ND	--	--	62	ND	85	ND

1 J flag (estimated concentration)

2 Blank result exceeds 10% of sample result; sample result considered suspect.

3 Method 8260B with MDL = 0.10 µg/l and RL = 0.50 µg/l. Also result of ND with MDL = 0.13 µg/l and RL = 0.50 µg/l under Method 610.

4 Sample collected 4 April 2002

5 Lab note: possible laboratory contamination

6 Also ND for 4 April 2002 sample.

Table 1—Live Oak Wastewater Treatment Plant, Order No. R5-2004-0096: Detectable Results (µg/l)

Constituents	28 Mar 2002			2 July 2002			28 Jan 2003		11 Feb 2003		21 Oct 2003	
	R-1	R-2	Blank	R-1	R-2	Blank	Effluent	Blank	Effluent	Blank	Effluent	Blank
<i>Nickel</i>	ND	ND	ND	11	4.6¹	ND	--	--	1.3¹	ND	4.2¹	ND
<i>Selenium</i>	1.5¹	1.9¹	ND	ND	ND	ND	--	--	ND	3.82¹	ND	ND
<i>Thallium</i>	ND	ND	ND	0.62^{1,2}	0.36^{1,2}	0.736¹	--	--	ND	0.426¹	ND	ND
<i>Zinc</i>	ND	ND	ND	27	5.0¹	ND	--	--	ND	ND	16¹	ND
<i>Aldrin</i>	ND	ND	ND	ND	ND	--	0.014	--	--	--	ND	ND
<i>Lindane</i>	ND	ND	ND	ND	ND	--	0.009¹	--	--	--	ND	ND
Carbofuran	3.49^{1,4}	2.9^{1,4}	ND ⁴	ND	ND	ND	2.74¹	--	--	--	ND	ND
Dalapon	0.37¹	0.50¹	ND	ND	ND	ND	--	--	--	--	ND	ND
Picloram	ND	0.029¹	ND	ND	ND	ND	--	--	--	--	ND	ND
Simazine (Princep)	ND	ND	ND	ND	ND	ND	ND	ND	--	--	0.20¹	ND
Diazinon	ND	ND	ND	ND	ND	ND	ND	ND	0.22¹	ND	ND	ND
Dimethoate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.20¹	ND
Merphos	ND	ND	ND	0.46¹	ND	ND	--	--	ND	ND	ND	ND
Chloride (mg/l)	23	8.2	ND	65	54	ND	--	--	45	ND	65	0.269¹
Hardness (mg/l)	64	54	ND	36	41	ND	--	--	240	ND ⁷	240	ND ⁷
Foaming Agents (MBAS, mg/l)	0.26	0.28	ND	0.32	0.20	ND	--	--	0.11	ND	0.087	ND
Nitrate (as N)	6.6	2.5	ND	ND	0.83	ND	--	--	0.82	ND	0.95	ND
Nitrite (as N)	0.4	0.36	ND	ND	ND	ND	--	--	0.62	0.100¹	1.6	ND
Phosphorous, Total (as P, mg/l)	0.48	1.5	ND	3.1	2.9	ND	--	--	3.1	ND	9.1	ND
Sulfate (mg/l)	58	49	ND	42	44	ND	--	--	43	ND	58	ND
Sulfide (as S, mg/l)	ND	ND	ND	0.2	0.40	ND	--	--	0.2	ND	ND	ND

⁷ No blank result. ND results for both calcium and magnesium blanks.

Aluminum—According to information submitted by the Discharger in the Report of Waste Discharge and in additional submittals of analytical laboratory results, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the U.S. EPA National Recommended Ambient Water Quality Criteria for protection of freshwater aquatic life for aluminum. Aluminum was detected in an effluent sample collected 11 February 2003 at a concentration of 250 µg/l. The recommended continuous concentration (maximum four-day average concentration) is 87 µg/l and the recommended maximum concentration (maximum one-hour average concentration) is 750 µg/l. The measured and projected maximum effluent concentrations are greater than the water quality criteria; therefore, effluent limitations for aluminum are required.

In U.S. EPA's *Ambient Water Quality Criteria for Aluminum—1988* [EPA 440/5-86-008], U.S. EPA states that “[a]cid-soluble aluminum...is probably the best measurement at the present...”; however, U.S. EPA has not yet approved an acid-soluble test method for aluminum. Replacing the ICP/AES portion of the analytical procedure with ICP/MS would allow lower detection limits to be achieved. Based on U.S. EPA's discussion of aluminum analytical methods, Order No. R5-2004-0096 allows the use of the alternate aluminum testing protocol described above to meet monitoring requirements.

The U.S. EPA Technical Support Document for Water Quality-based Toxics Control recommends converting chronic (four-day) and acute (one-hour) aquatic life criteria to average monthly and maximum daily effluent limitations based on the variability of the existing data and the expected frequency of monitoring. Equations summarizing the conversion are shown below:

$$AMEL = 1.30[\min(0.492CMC, 0.687CCC)] \quad MDEL = 2.03[\min(0.492CMC, 0.687CCC)]$$

where: AMEL = average monthly effluent limitation
MDEL = maximum daily effluent limitation
CCC = criteria continuous concentration (four-day average)
CMC = criteria maximum concentration (one-hour average)

Order No. R5-2004-0096 includes maximum one-day and one-month effluent limitations for aluminum.

Ammonia—Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrite and nitrite to nitrate. The Discharger partially nitrifies 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. Aquatic habitat is a beneficial use of the receiving stream. The Basin Plan prohibits the discharge of toxic materials in toxic concentrations. U.S. EPA has developed pH- and temperature-dependent Ambient Water Quality Criteria for ammonia. The discharge from the Live Oak Wastewater Treatment Plant has a reasonable potential to cause or contribute to an in-stream excursion above water quality standards for ammonia. The Discharger recently completed an upgrade and expansion of the WWTP that included the addition of aeration facilities that will result in improved nitrification of the waste stream. Effluent Limitations for ammonia are included in this Order to assure the treatment process adequately nitrifies the waste stream to protect the beneficial use of aquatic habitat.

In water, un-ionized ammonia (NH₃) exists in equilibrium with the ammonium ion (NH₄⁺). 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. R5-2004-0096.

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.

Federal Regulations 40 (CFR) §133 allows for the adjustment of BOD and TSS limits for facilities that provide treatment equivalent to secondary treatment utilizing stabilization ponds as the principal method of treatment. The Discharger’s facility uses waste stabilization ponds as the principal treatment process. 40 CFR §133.105(a) and (b) require equivalent to secondary treatment systems to maintain an effluent quality of not more than 45 mg/l as a 30-day average and not more than 65 mg/l as a 7-day average for BOD and TSS. In addition, the 30-day average percent removal (concentration-based) of BOD and TSS is required not to fall below 65 percent. These apparently less stringent standards are based on the fact that ponds grow algae, which results in higher BOD and TSS concentrations. The higher effluent BOD and TSS concentrations from pond treatment systems reflect algal growth rather than a lack of treatment of the domestic wastewater. Under 40 CFR §133.101(g), the Live Oak Wastewater Treatment Plant treatment system is eligible for equivalent to secondary BOD and TSS limitations. 40 CFR §133.103(c) allows further adjustments to the TSS limitations, provided that waste stabilization ponds are the principal process for secondary treatment and operation and maintenance data indicate that the TSS values specified in 40 CFR §133.105 cannot be achieved. Data contained in discharger self-monitoring

reports indicate that the Discharger cannot consistently comply with the TSS values specified in 40 CFR §133.105. The limitations may be set at the effluent concentration achieved 90 percent of the time within an appropriate contiguous geographical area by waste stabilization ponds that are achieving a monthly average BOD concentration of 45 mg/l. The nearest known waste stabilization pond system discharging to surface waters that consistently has an effluent BOD quality of better than 45 mg/l as a monthly average is the City of Williams WWTP. The TSS concentration achieved 90 percent of the time at this facility is 70 mg/l. The current permit (Order No. 99-008) requires the Discharger to comply with secondary treatment standards of 30 mg/l and 85% removal as monthly averages for effluent BOD and TSS. 40 CFR §122.44(l)(1) states: “*Except as provided in paragraph (1)(2) of this section when a permit is renewed or reissued, interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under §122.62.)*” Since the time of the current permit’s adoption, the clarigester utilized as a treatment unit at the WWTP has broken down and the Discharger’s search for replacement parts has been unsuccessful. The solids removal benefits of the clarigester are no longer being realized at the Live Oak WWTP. This constitutes a material and substantial change to the circumstances in place at the time of adoption of the current permit. Effluent Limitations for BOD and TSS based on equivalent to secondary treatment standards are included in this permit only until 1 April 2009, when the tertiary treatment requirements described in Finding 22 take effect.

The WWTP is required to comply with effluent limitations appropriate for treatment systems providing tertiary or equivalent treatment. Effluent limitations for both BOD and TSS have been established at 10 mg/l, as a 30-day average, which is technically based on the capability of a tertiary system. In addition, 40 CFR 133.102, in describing the minimum level of effluent quality attainable by secondary treatment, states that the 30-day average percent removal shall not be less than 85 percent. If 85 percent removal of BOD and TSS must be achieved by a secondary treatment plant, it must also be achieved by a tertiary (*i.e.*, treatment beyond secondary level) treatment plant. Order No. R5-2004-0096 contains a limitation requiring an average of 85 percent removal of BOD and TSS over each calendar month.

Cadmium— 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 criteria for cadmium. The CTR includes hardness-dependent criteria for the protection of freshwater aquatic life for cadmium. Freshwater aquatic habitat is a beneficial use of the receiving stream. The standards for cadmium 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 $1.101672 - [0.041838 \times \ln(\text{hardness})]$ for the chronic criteria and $1.136672 - 0.041838 \times \ln(\text{hardness})$ for the acute criteria.

Using the worst-case (lowest) measured hardness from the effluent and receiving water, (36 mg/l), the applicable continuous concentration (maximum four-day average concentration) is 1.1 µg/l and the applicable maximum concentration (maximum one-hour average concentration) is 1.4 µg/l. Cadmium has not been detected in the effluent and all of the reported detection limits for reported sample results were less than the standard; therefore, according to Step 3 of Section 1.3 of the SIP, the MEC was set equal to the lowest detection level, which was 0.11 µg/l. The maximum observed upstream receiving

water cadmium concentration was 31 µg/l, from a sample collected 2 July 2002. The SIP requires effluent limitations for NTR and CTR constituents when the background (upstream receiving water) concentration exceeds an applicable criterion. Effluent Limitations for cadmium are included in this Order and are based on the CTR criteria for the protection of freshwater aquatic life.

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

$$CCC = e^{[0.7852 \ln(\text{hardness}) - 2.715]} \qquad AMEL = 1.55[\min(0.321MC, 0.527CCC)]$$
$$CMC = e^{[1.128 \ln(\text{hardness}) - 3.6867]} \qquad MDEL = 3.11[\min(0.321CMC, 0.527CCC)]$$

Order No. R5-2004-0096 includes maximum one-day and one-month hardness-dependent cadmium limitations.

Chlorine, Total Residual—The Basin Plan prohibits the discharge of toxic materials in toxic concentrations. The Discharger uses chlorine for disinfection of the effluent waste stream. Aquatic habitat is a beneficial use of the Sutter Bypass. 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, maximum 1-hour average and 4-day average chlorine concentrations of 0.019 µg/l and 0.011 µg/l, respectively. The use of chlorine as a disinfectant presents a reasonable potential that it could be discharged in toxic concentrations. Effluent Limitations for chlorine have been included in this Order to protect the receiving stream aquatic life beneficial uses. Effluent Limitations have been established based on the ambient water quality criteria for chlorine.

Average one-hour and four-day effluent limitations for chlorine, based on these criteria, are included in Order No. R5-2004-0096.

Copper—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 copper. The CTR includes hardness-dependent standards for the protection of freshwater aquatic life for copper. Freshwater aquatic habitat is a beneficial use of the receiving water. The 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.

The maximum observed effluent copper concentration was detected in a sample collected 21 October 2003 at a concentration of 5.3 µg/l. Using the reasonable potential analysis procedure described above, the projected maximum effluent copper concentration is 5.3 µg/l. Using the worst-case (lowest) measured hardness from the effluent and receiving water, (36 mg/l), the applicable continuous concentration (maximum four-day average concentration) is 3.9 µg/l and the applicable maximum concentration (maximum one-hour average concentration) is 5.3 µg/l. The measured and projected maximum effluent concentrations are greater than the water quality criteria; therefore, Effluent

Limitations for copper are required. The Effluent Limitations for copper included in this Order are presented in total concentrations, and are based on CTR standards for the protection of freshwater aquatic life.

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

$$CCC = e^{[0.8545 \ln(\text{hardness}) - 1.702]} \quad AMEL = 1.55[\min(0.321MC, 0.527CCC)]$$

$$CMC = e^{[0.9422 \ln(\text{hardness}) - 1.700]} \quad MDEL = 3.11[\min(0.321CMC, 0.527CCC)]$$

Order No. R5-2004-0096 includes maximum one-day and one-month hardness-dependent copper limitations.

Cyanide—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 cyanide. The CTR includes maximum 1-hour average and 4-day average cyanide concentrations of 22 µg/l and 5.2 µg/l, respectively, for the protection of freshwater aquatic life. Freshwater aquatic habitat is a beneficial use of the Sutter Bypass.

Cyanide has not been detected in the effluent and all of the reported detection limits for reported sample results were less than the standard; therefore, according to Step 3 of Section 1.3 of the SIP, the MEC was set equal to the lowest detection level, which was 5.0 µg/l. The maximum observed upstream receiving water cyanide concentration was 6.9 µg/l, from a sample collected 2 July 2002. The SIP requires effluent limitations for NTR and CTR constituents when the background (upstream receiving water) concentration exceeds an applicable criterion. Effluent Limitations for cyanide are included in this Order and are based on the CTR criteria for the protection of freshwater aquatic life.

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

$$AMEL = 1.55[\min(0.321MC, 0.527CCC)] \quad MDEL = 3.11[\min(0.321CMC, 0.527CCC)]$$

Order No. R5-2004-0096 includes maximum one-day and one-month cyanide limitations.

Diazinon—According to information submitted by the Discharger in the Report of Waste Discharge and in additional submittals of analytical laboratory results, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the California Department of Fish and Game's (DFG) recommended criteria for protection of freshwater aquatic life for diazinon. There are currently no CTR or NTR criteria for this constituent. The Basin Plan contains the narrative toxicity objective. The Basin Plan requires the Regional Board to consider relevant numerical criteria and guidelines developed by other agencies in determining compliance with the narrative toxicity objective. (Basin Plan, IV-17.00)

In March 2000, the California Department of Fish and Game (DFG) established acute and chronic limits for diazinon applicable to fresh water aquatic protection. The acute and chronic criteria are 0.08 µg/l and 0.05 µg/l, respectively. Diazinon was detected in an effluent sample collected 11 February 2003 at a concentration of 0.22 µg/l. This result was reported by the analytical laboratory as an estimated concentration (J flag). The concentration fell below the reporting limit (lowest quantifiable concentration) of 0.48 µg/l, but exceeded the method detection limit (MDL) of 0.15 µg/l. The minimum detection level of 0.15 µg/l exceeds the criteria of 0.05 µg/l and 0.08 µg/l. Since the minimum detection level exceeds the criteria, any detected concentration above the minimum detection level, estimated or otherwise, also exceeds the criteria. Based on evaluation of the information provided, the discharge does have the reasonable potential to cause or contribute to an excursion above the narrative toxicity objective in the Basin Plan. Inclusion of Effluent Limitations for diazinon in this Order is additionally supported by the 303(d) listing of the Sutter Bypass as an impaired water body for diazinon (no assimilative capacity). Effluent Limitations for diazinon are included in this Order and are based on the DFG water quality criteria for the protection of freshwater aquatic habitat.

The U.S. EPA Technical Support Document for Water Quality-based Toxics Control recommends converting chronic (four-day) and acute (one-hour) aquatic life criteria to average monthly and maximum daily effluent limitations based on the variability of the existing data and the expected frequency of monitoring. Equations summarizing the conversion are shown below:

$$AMEL = 1.55[\min(0.321MC, 0.527CCC)] \quad MDEL = 3.11[\min(0.321CMC, 0.527CCC)]$$

Order No.R5-2004-0096 includes maximum one-day and one-month effluent limitations for diazinon.

Flow—The WWTP was designed to provide a secondary level of treatment for up to its design flow of 1.4 mgd. The effluent flow limit is therefore set at 1.4 mgd.

Organochlorine Pesticides (Group A Pesticides)—Based on information included in analytical laboratory reports submitted by the Discharger, aldrin was detected at 0.014 µg/l and lindane (gamma BHC) was detected at 0.009 µg/l (J flag) in the WWTP effluent. Both constituents are chlorinated hydrocarbon pesticides. The Basin Plan requires that no individual pesticides shall be present in concentrations that adversely affect beneficial uses; discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses; total chlorinated hydrocarbon pesticides shall not be present in the water column at detectable concentrations; and pesticide concentrations shall not exceed those allowable by applicable antidegradation policies. The CTR contains a numeric criterion for aldrin of 0.00014 µg/l for freshwaters from which organisms are consumed. The detection of aldrin at 0.014 µg/l and lindane at 0.009 µg/l in the WWTP effluent presents a reasonable potential to exceed the Basin Plan limitations for chlorinated hydrocarbon pesticides and the CTR criterion for aldrin. In addition to aldrin and lindane (gamma BHC), the chlorinated hydrocarbon pesticides include alpha BHC, beta BHC, delta BHC, DDD, DDE, 4,4'-DDT, aldrin, chlordane, dieldrin, endrin, endrin aldehyde, alpha and beta endosulfan, endosulfan sulfate, heptachlor, heptachlor epoxide, and toxaphene. Effluent Limitations for organochlorine pesticides are included in this Order and are based on the Basin Plan objective of no detectable chlorinated hydrocarbon pesticides. The limitation for chlorinated hydrocarbon pesticides is included based on reasonable potential to violate the water quality objective.

Pathogens—Tertiary treatment is required to protect the beneficial uses of water contact recreation and agricultural irrigation downstream of the discharge into Reclamation District 777 Lateral Drain No. 1. The effluent limitation for total coliform organisms is intended as an indicator of the effectiveness of the entire treatment train and the effectiveness of pathogen removal. The method of treatment is not prescribed by Order No. R5-2004-0096; however, wastewater must be treated to a level equivalent to that specified in Title 22 and in other recommendations by the California Department of Health Services.

Upstream of the discharge point, Reclamation District 777 Lateral Drain No. 1 is ephemeral. At times, Reclamation District 777 Lateral Drain No. 1 provides little or no dilution for wastewater effluent discharged from the WWTP. The California Code of Regulations, Title 22, contains criteria for the reuse or recycling of wastewater as an alternative to discharging to a receiving stream. Title 22 reclamation criteria were established to create minimum wastewater treatment standards to protect the public health when this water is reused for beneficial uses. The criteria are not directly applicable to streams that receive wastewater and the subsequent use of the combined stream/wastewater. This permit does not apply Title 22 standards to the discharge. However, in assessing the discharge standards necessary to protect the site-specific beneficial uses of Reclamation District 777 Lateral Drain No. 1, Title 22 standards were compared to the level of treatment required to protect the public health when in contact with treated wastewater or when directly using undiluted effluent for food crop irrigation. Title 22 states that, for reuse as irrigation water for food crops and to protect for nonrestricted contact recreation, it is necessary for wastewater to receive tertiary treatment resulting in coliform counts that do not exceed 2.2 MPN/100 ml as a 7-day median, 23 MPN/100 ml more than once in any 30 day period, and 240 MPN/100 ml ever.

The California Department of Health Services (DHS) has determined that a specific level of treatment is required for recycled water delivered in a dedicated pipe or canal. Reclamation District 777 Lateral Drain No. 1, which is ephemeral, is essentially the same as any other conveyance system (pipe or canal) when sufficient upstream flows are not present for dilution. Therefore, the same level of treatment as that required for recycled water would be necessary to protect the public if the water is delivered in a dry streambed for the same uses. In a letter to Regional Board staff, dated 8 April 1999, DHS concurred with the need to protect beneficial uses and recommended that the level of treatment required under Title 22 of the California Code of Regulations for reclaimed water in a dedicated pipe or canal be applied to agricultural drains or streams where the water may be used or diverted for beneficial uses. Therefore, Order No. R5-2002-0050 includes tertiary effluent limitations based on protecting the beneficial uses of nonrestricted contact recreation and irrigation in Reclamation District 777 Lateral Drain No. 1, Main Canal, and the Sutter Bypass.

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.” No reliable dilution is available in the receiving stream, so the Order includes effluent limitations for pH at the Basin Plan objective values.

Salts—The City of Live Oak discharges treated wastewater to Reclamation District 777 Lateral Drain No. 1. The Basin Plan, Table II-1, designates Irrigated Agriculture as a beneficial use of the Sutter Bypass, to which Reclamation District 777 Lateral Drain No. 1 is tributary. Water Rights have been

issued by the State Water Resources Control Board to divert water from Reclamation District 777 Lateral Drain No. 1 for irrigation purposes. Water from Reclamation District 777 Lateral Drain No. 1 is used for crop irrigation. The City's discharger self-monitoring reports show that for electrical conductivity, the maximum concentration was 930 $\mu\text{mhos/cm}$ and the average discharge concentration was 790 $\mu\text{mhos/cm}$.

The Basin Plan states, on Page III-3.00 Chemical Constituents, that “[w]aters shall not contain constituents in concentrations that adversely affect beneficial uses.” The Basin Plan's “Policy for Application of Water Quality Objectives” provides that in implementing narrative water quality objectives, the Regional Board will consider numerical criteria and guidelines developed by other agencies and organizations. This application of the Basin Plan is consistent with Federal Regulations, 40 CFR 122.44(d).

For electrical conductivity, *Ayers R.S. and D.W. Westcott, Water Quality for Agriculture, Food and Agriculture Organization of the United Nations – Irrigation and Drainage Paper No. 29, Rev. 1, Rome (1985)*, reports levels above 700 $\mu\text{mhos/cm}$ will reduce crop yield for sensitive plants. The University of California, Davis Campus, Agricultural Extension Service, published a paper, dated 7 January 1974, stating that there will not be problems to crops associated with salt if the electrical conductivity remains below 750 $\mu\text{mhos/cm}$.

As described above, agricultural supply is a beneficial use of the receiving waters, Reclamation District 777 Lateral Drain No. 1, Main Canal, and the Sutter Bypass. Domestic and industrial uses of water result in an increase in the mineral content of the wastewater. The minerals include calcium, sodium sulfate, and other dissolved salts, including chloride. The salinity of wastewater is determined by measuring electrical conductivity (EC) or total dissolved solids (TDS), which are parameters used to describe the suitability of wastewater for irrigation.

To protect agricultural irrigation use, studies have recommended an agricultural water quality goal of 700 $\mu\text{mhos/cm}$ for electrical conductivity. In the Basin Plan, numeric water quality objectives for the protection of beneficial uses have been established for electrical conductivity in the Sacramento River, between the Colusa Basin Drain and the “I” Street Bridge and in the Feather River, from the Fish Barrier Dam at Oroville to the Sacramento River. The discharge to Reclamation District 777 Lateral Drain No. 1 is eventually tributary to the Sacramento River (during normal and high flow conditions) between the Colusa Basin Drain and the “I” Street Bridge and to the Feather River (during high flow conditions only) between the Fish Barrier Dam and the Sacramento River.

Effluent monitoring results submitted by the Discharger in discharger self-monitoring reports include reported effluent concentrations ranging from 80 to 930 $\mu\text{mhos/cm}$, with an average of 790 $\mu\text{mhos/cm}$. Upstream receiving water (R-1) monitoring results ranged from 48 to 930 $\mu\text{mhos/cm}$ upstream and averaged 667 $\mu\text{mhos/cm}$. Downstream receiving water (R-2) concentrations ranged from 8 to 1,200 $\mu\text{mhos/cm}$, with an average of 609 $\mu\text{mhos/cm}$. Pumped agricultural irrigation intakes and discharges located between the point of discharge and the receiving stream monitoring stations (R-1 and R-2) affect the usefulness of these data points by effecting water quality changes not associated with the discharge and occasionally altering flow direction. With the available data, it is not possible to determine whether the discharge causes agriculture irrigation goals to be exceeded in the receiving water. Therefore, this

Order contains a Provision for a study with compliance schedule to determine whether electrical conductivity in the receiving water exceeds the agriculture irrigation goals. The Provision requires the Discharger to determine the salinity of the community water supply and to assess possible sources, including a seasonal food processing industry, and source control measures. The Provision allows the Regional Board to reopen the permit if monitoring results indicate Effluent Limitations are necessary.

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. R5-2004-0096 contains average monthly and average daily effluent limitations for settleable solids.

Toxicity—The Basin Plan states that “[a]ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.” The Basin Plan requires that “[a]s a minimum, compliance with this objective...shall be evaluated with a 96-hour bioassay.” Order No. R5-2004-0096 requires both acute and chronic toxicity monitoring to evaluate compliance with this water quality objective.

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

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. R5-2004-0096. 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.

40 CFR §133.101(j) defines percent removal as: “A percentage expression of the removal efficiency across a treatment plant for a given parameter, as determined from the 30-day average values of the raw wastewater influent pollutant concentrations to the facility and the 30-day average values of the effluent pollutant concentrations for a given time period.”

RECEIVING WATER LIMITATIONS AND MONITORING

Fecal coliform—The Sutter Bypass 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 Sutter Bypass has been designated as having the beneficial use of cold fish migration habitat and cold spawning 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 Sutter Bypass, 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 Sutter Bypass has the beneficial uses of both COLD and WARM. The Basin Plan includes the objective that “[a]t no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5°F above natural receiving water temperature.” 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 E.2 (biostimulatory substances), E.3 (color), E.5 (floating material), E.6 (oil and grease), E.8 (radioactivity), E.8 (settleable material), E.9 (tastes and odors), and E.11 (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.

POND AND LAGOON LIMITATIONS AND MONITORING

Dissolved Oxygen—Anaerobic (lacking in oxygen) processes tend to produce aesthetically undesirable odors. To minimize production of undesirable odors, the Discharger is required to maintain some (at least 1.0 mg/l) dissolved oxygen in the upper one foot of the pond.

Freeboard—The Order contains a limitation for pond freeboard. Pond levees can fail for a variety of reasons, typically, a lack of maintenance or overtopping due to wave action. The Order requires a minimum pond freeboard of two feet be maintained to prevent overtopping.

pH—The disposal ponds at the City of Live Oak WWTP are unlined, so wastewater 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>]. A pond pH limitation range of 6.5 to 8.5 helps to ensure that the Discharger’s wastewater treatment activities do not cause the groundwater taste and odor objective to be violated.

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. Many metals are priority toxic pollutants. Elevated metal concentrations in the groundwater would violate the groundwater toxicity objective included in the Basin Plan.

MRH