CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2004-0118

NPDES NO. CA0004812

WASTE DISCHARGE REQUIREMENTS FOR STATE OF CALIFORNIA DEPARTMENT OF FISH AND GAME SAN JOAQUIN FISH HATCHERY FRESNO COUNTY

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

1. The State of California, Department of Fish and Game (DFG), which operates the San Joaquin Fish Hatchery, submitted a Report of Waste Discharge on 13 April 2004 and applied for a renewal of its permit to discharge under the National Pollutant Discharge Elimination System (NPDES) program. The DFG also owns the facility and is hereafter referred to as the Discharger.

2. The discharge of treated flow-through process wastewater to the San Joaquin River was previously regulated by Waste Discharge Requirements (WDRs) Order No. 97-001 (NPDES No. CA0004812), adopted by the Regional Board on 24 January 1997.

3. The hatchery is located approximately 20 miles northeast of Fresno in Section 7, Township 11 South, Range 21 East, MDB&M, in Friant, California, as shown on Attachment A, a part of this Order. The hatchery is a cold-water flow-through facility that includes an intake structure at the Friant Dam; incubator trays; eight trout rearing ponds each 600 feet long, broodstock ponds and a spawning house; aeration capability, and five settling ponds and a constructed wetlands area to treat the full flow of the facility. The facility also includes eight redwood tanks for additional growing space and special experiments; food storage facilities; public restrooms; chemical storage facilities; six homes; and septic system with a 110 foot by 150 foot leach field. With construction of the leach field, the Facility discontinued the use of two domestic wastewater ponds. Discharges of domestic wastewater are not authorized by this Order. Discharge of treated flow-through process water from the hatchery activities to the San Joaquin River occurs at Discharge Outfall 001, approximately 36° 59' 50" S latitude and 119° 43' 08" E longitude, immediately upstream from Lost Lake Park.

4. The United States Environmental Protection Agency (USEPA) and the Regional Board have classified this discharge to the San Joaquin River as a minor discharge.

5. Based on the Report of Waste Discharge, the hatchery annually produces approximately 400,000 pounds of rainbow trout and 1,800 pounds of Kokanee annually, and uses approximately 70,000 pounds of food during the calendar month of maximum feeding (April).

6. From Millerton Lake at the Friant Dam, the Discharger receives raw water, which is conveyed in a 38-inch pipeline to the hatchery. Discharge Monitoring Reports from 1999 to 2003 reported an average daily flow through the hatchery of 23.2 million gallons per day (mgd) with no variation from this flow rate. The Discharger reports this flow represents the flow capacity of the gravity fed system. Attachment B, a part of this Order, shows a flow schematic of the facility.

7. According to monthly Discharge Monitoring Reports between 1999 and 2003 influent water quality has the following characteristics.

Constituent	Units	Range
Temperature	°C	8 – 15
Total Suspended Solids (TSS)	mg/L	ND – 2.1
pH	pH units	6.6 – 8.2
Conductivity	µmhos/cm	26 – 56
Turbidity	NTUs	0.5 – 6.3

8. Data from monthly self-monitoring reports between 1999 and 2003 indicate the following effluent characteristics.

Constituent	Units	Minimum	Maximum	Average
BOD_5	mg/L	ND	9.4	1.5
TSS	mg/L	ND	8.7	1.4
Settleable Solids	ml/L	< 0.01	< 0.1	< 0.1
Conductivity	µmhos/cm	29	56	46
Turbidity	NTUs	0.6	4.2	1.4

9. Aquaculture drugs and chemicals are used at some concentrated aquatic animal production facilities to treat fish directly for parasites, fungi, and bacteria, as well as to clean rearing raceways in order to reduce the spread of disease among the confined fish population. With the exception of sodium chloride, the Discharger has not reported using aquaculture drugs and chemicals at the Facility. The Discharger confirmed in communication with the Regional Board, dated 23 April 2004, the potential use of the following additional aquaculture drugs and chemicals in the future: copper sulfate, formalin (as a 37% formaldehyde, methanol-free solution), potassium permanganate, hydrogen peroxide, PVP iodine, tricane methanesulfonate (MS-222). chloramine-T, Aqui-S®, carbon dioxide, sodium bicarbonate, acetic acid, antibiotics such as oxytetracycline (Terramycin®) and florfenicol as feed additives and penicillin G and oxytetracycline as immersive bath treatments during periods of disease outbreak, Romet-30® (sulfadimethoxine-ormetoprim), erythromycin, amoxycillin, vibrio vaccine, and enteric redmouth bacertin.

10. A cold-water concentrated aquatic animal production (CAAP) facility is defined in Title 40 of the Code of Federal Regulations (40 CFR 122.24) as a fish hatchery, fish farm, or

other facility which contains, grows, or holds cold-water fish species or other cold-water aquatic animals including, but not limited to, the Salmonidae family of fish (e.g. trout and salmon) in ponds, raceways, or other similar structures. In addition, the facility must discharge at least 30 calendar days per year, produce at least 20,000 pounds harvest weight (9,090 kilograms) of aquatic animals per year, and feed at least 5,000 pounds (2,272 kilograms) of food during the calendar month of maximum feeding. A facility that does not meet the above criteria may also be designated a cold water CAAP facility upon a determination that the facility is a significant contributor of pollution to waters of the United States [40 CFR 122.24 (c)]. Cold-water, flow-through CAAP facilities are designed to allow the continuous flow of fresh water through tanks and raceways used to produce aquatic animals (typically cold-water fish species). Flows from CAAP facilities ultimately are discharged to waters of the United States and of the State. 40 CFR 122.24 specifies that CAAP facilities are point sources subject to the National Pollutant Discharge Elimination System (NPDES) program. The Discharger's facility meets the definition of a cold-water, flow-through CAAP facility.

11. The operation of CAAP facilities may introduce a variety of pollutants into receiving waters. USEPA identifies three classes of pollutants: (1) conventional pollutants (i.e., total suspended solids (TSS), oil and grease (O&G), biochemical oxygen demand (BOD), fecal coliforms, and pH); (2) toxic pollutants (e.g., metals such as copper, lead, nickel, and zinc and other toxic pollutants; and (3) non-conventional pollutants (e.g., ammonia-N, formalin, and phosphorus). Some of the most significant pollutants discharged from CAAP facilities are solids from uneaten feed and fish feces that settle to the bottom of the raceways. Both of these types of solids are primarily composed of organic matter including BOD, organic nitrogen, and organic phosphorus.

12. Fish raised in CAAP facilities become vulnerable to disease and parasites. Various aquaculture drugs and chemicals are used at CAAP facilities to ensure the health and productivity of the confined fish population. Aquaculture drugs and chemicals are used to prevent and treat disease, clean equipment, condition water, and anesthetize fish prior to spawning or tagging activities. As a result of these drug and chemical applications, residuals of such materials may be present in discharges to waters of the United States and/or to waters of the State. According to monthly Discharge Monitoring Reports and an on-site inspection conducted on 22 January 2003, the Discharger reports no aquaculture chemicals or drugs are used at the facility except sodium chloride. However, the Discharger believes there may be a need to use other drugs or chemicals in the future and, as a result, drugs and chemicals may be present in future discharges to waters of the United States or waters of the State.

13. In August 2004, USEPA promulgated Effluent Limitation Guidelines and New Source Performance Standards for the Concentrated Aquatic Animal Production Point Source Category (hereafter "ELG"). The ELG regulation establishes national technology-based effluent discharge requirements for flow-through and recirculating systems and for net pens based on Best Practicable Control Technology Currently Available (BPT); Best

Control Technology for Conventional Pollutants (BCT); Best Available Technology Economically Achievable (BAT); and New Source Performance Standards (NSPS). In its proposed rule, published on 12 September 2002, USEPA proposed to establish numeric limitations for a single constituent – total suspended solids (TSS) – while controlling the discharge of other constituents through narrative requirements. In the final rule, however, the USEPA determined that, for a nationally applicable regulation, it would be more appropriate to promulgate qualitative TSS limitations in the form of solids control best management practices (BMP) requirements. Furthermore, the final ELG does not include numeric effluent limitations for non-conventional and toxic constituents, such as aquaculture drugs and chemicals, but also relies on narrative limitations to address these constituents.

14. 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 describes an implementation program and policies to achieve water quality objectives for all waters of the Basin. This includes plans and policies adopted by the State Water Resources Control Board (SWRCB) and incorporated by reference, such as Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California" (Resolution No. 68-16). These requirements implement the Basin Plan. The Basin Plans, as amended, designate beneficial uses, establish water quality objectives, and contain implementation plans and policies for waters of the Basins. Pursuant to the California Water Code §13263 (a), waste discharge requirements must implement the Basin Plans.

15. Resolution No. 68-16 requires the Regional Board, in regulating discharges of waste, to maintain high quality waters of the State unless a change in water quality will be consistent with the maximum benefit of 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. Resolution 68-16 requires that discharges be regulated to meet best practicable treatment or control so that pollution or nuisance will not occur, and that the highest water quality be consistently maintained for the maximum benefit of the people of the State. The Regional Board has considered Resolution 68-16 and USEPA antidegradation regulations at 40 CFR 131.12, and the proposed waste discharge requirements are consistent with those requirements and will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.

16. USEPA adopted the *National Toxics Rule* (NTR) on 22 December 1992, which was amended on 4 May 1995 and 9 November 1999, and the *California Toxics Rule* (CTR) on 18 May 2000, which was amended on 13 February 2001. These Rules contain water quality standards applicable to this discharge. The SWRCB adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Policy or SIP) on 2 March 2000, which contains policies and procedures for implementation of the NTR and the

CTR.

BENEFICIAL USES

17. The beneficial uses of the San Joaquin River from the Friant Dam to the Mendota Pool, as identified in table II-1 of the Basin Plan, are: municipal and domestic supply (MUN); stock watering and irrigation (AGR); industrial water supply (PROC); water contact recreation, including canoeing and rafting (REC-1); non-contact water recreation (REC-2); warm and cold freshwater habitat (WARM and COLD); warm and cold water migration habitat (MIGR); warm and cold water spawning, reproduction, and/or early habitat (SPWN); and wildlife habitat (WILD).

18. Beneficial uses of the underlying groundwater are municipal and domestic supply (MUN), agricultural supply (AGR), and industrial service (IND) and industrial process supply (PRO).

EFFLUENT LIMITATIONS AND REASONABLE POTENTIAL

19. Federal regulations at 40 CFR Section 122.44 require NPDES permits to contain effluent limitations, including technology-based and water quality-based limitations and limitations based on toxicity.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

20. USEPA's final ELG for the aquaculture industry does not include numeric effluent limitations on any conventional, non-conventional, or toxic constituents. Rather, USEPA promulgated qualitative limitations in the form of BMP requirements. Technology-based requirements in this Order are based on a combination of application of the ELG for BMP requirements and case-by-case numeric limitations developed using best professional judgment (BPJ) and carried over from the previous Order 97-001. These effluent limitations are 5.0 mg/L net TSS as an average monthly limitation and 15 mg/L net TSS as a maximum daily limitation; and 0.1 ml/L settleable solids as an average monthly limitation and 0.2 ml/L settleable solids as a maximum daily limitation. Section 402(o) of the CWA prohibits backsliding of effluent limitations that are based on BPJ to reflect a subsequently promulgated ELG which is less stringent. Removal of these numeric limitations for TSS and settleable solids would constitute backsliding under CWA Section 402(o). The Regional Board has determined that these numeric effluent limitations for TSS and settleable solids continue to be applicable to the Facility and that backsliding is not appropriate. These limitations are established as a means of controlling the discharge of solids from algae, silt, fish feces and uneaten feed. Previous Orders for hatcheries have expressed effluent limitations for TSS in terms of a net limitation. The Regional Board finds the use of a net TSS effluent limitation is an appropriate measure of performance and a correct interpretation of this limitation, and does not constitute backsliding (40 CFR 122.44(l)(2)(i)(B)(2)). Results of monitoring indicate the Discharger is capable of

meeting these limitations. This Order does not include mass effluent limitations for TSS because there are no standards that specifically require a mass-based effluent limitation, mass of the pollutant discharged is not specifically related to a measure of operation (40 CFR 122.45(f)(iii)), and, in addition, mass-based effluent limitations for TSS are not necessary because this Order includes both concentration-based limitations and a maximum flow limitation. These changes are consistent with Federal anti-backsliding provisions of 40 CFR 122.44(l)(1) and 122.62(a)(2).

21. Order No. 97-001 included technology-based effluent limitations for BOD based upon BPJ. This Order does not include limitations for BOD, as the control of TSS and settleable solids in the discharge and implementation of a Best Management Practices Plan will effectively control levels of BOD in the discharge. This determination is based on findings of USEPA Region 10 presented in its General NPDES Permit (No. ID-G13-0000) for Aquaculture Facilities in Idaho and the accompanying Fact Sheet, as well as observation and analysis of monitoring data from aquaculture facilities throughout the Central Valley Region. In addition, USEPA's proposed ELG for CAAP facilities (12 September 2002) stated that controlling TSS discharges from flow-through, CAAP facilities will effectively control BOD and nutrients. The final ELG also correlates TSS removal and BOD removal. Because of this new that has become available to the Regional Board since adoption of Order No. 97-001, effluent limitations have been removed from this Order. This change is consistent with the Federal anti-backsliding provisions of 40 CFR 122.44 (l)(2) and 122.62 (a)(16).

WATER QUALITY-BASED EFFLUENT LIMITATIONS (WQBELS)

22. The federal regulations at 40 CFR 122.44 (d)(1) require effluent limitations for all pollutants that are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an in-stream excursion above a numeric water quality criterion (such as a CTR criterion) or a narrative water quality criterion within a State water quality standard. These regulations also set forth a methodology for establishing effluent limitations based on narrative state water quality criteria [40 CFR 122.44 (d) (1) (vi) (A-C)].

23. The USEPA, SWRCB, and Regional Board have adopted or published standards that are used to implement 40 CFR 122.44. The USEPA has promulgated the CTR and NTR that established water quality criteria. The SWRCB has adopted the SIP that implements the CTR and NTR. The USEPA also has published recommended ambient water quality criteria and the Basin Plan contains numeric and narrative water quality objectives. The Basin Plan contains an Implementation Policy ("Policy for Application of Water Quality Objectives") that, in part, sets forth a process for translating narrative water quality objectives into numeric effluent limitations. The USEPA ambient water quality criteria and the Basin Plan "Policy of Application of Water Quality Objectives" are used to implement 40 CFR 122.44 (d)(1) (v).

24. A letter pursuant to CWC Section 13267 has been issued to the Discharger requesting receiving water and effluent monitoring data to perform a reasonable potential analysis for the CTR pollutants. Effluent and receiving water samples collected on 11 December 2001, and analyzed for volatile and semi-volatile substances, metals, asbestos, 2,3,7,8-TCDD, and sixteen dioxin congeners showed that none of the CTR priority pollutants were present in the discharge at levels that would cause or contribute to an in-stream excursion above a numeric water quality objective from the CTR. As described below, however, projections by DFG of the potential use of copper sulfate at the Facility and the estimated resulting concentration of copper in the discharge, indicate that copper may be discharged at a concentration that would cause, have the reasonable potential to cause, or contribute to an excursion from the CTR (acute and chronic) criteria for copper in the receiving water.

25. Based on information submitted as part of the Report of Waste Discharge, in annual and monthly monitoring reports, in studies performed by and correspondence with DFG, and in independent studies, the Regional Board has found that the discharge may cause, have the reasonable potential to cause, or contribute to in-stream excursions of applicable numeric water quality criteria or water quality objectives or narrative water quality objectives for the following constituents: copper, pH, and formaldehyde. Effluent limitations for these parameters are being established without benefit of dilution, as an allowance for dilution may be considered only after characterization of the receiving water flow by the Discharger to determine a dilution ratio and/or whether a dilution credit is appropriate.

CTR Constituents

26. Copper, primarily in the forms of copper sulfate and chelated copper compounds, is used in fish hatcheries to control algae and other vegetation that is susceptible to the toxic effects of copper uptake, and it is used to control the growth of external parasites and bacteria on fish. Copper sulfate may be used at the Facility at a rate of up to 0.5 pounds copper sulfate per 1 cfs in raceways. Applied over a two hour period, this application rate is equal to a copper sulfate concentration of 1.1 mg/L or a copper concentration of 0.4 mg/L. Applied over a four hour period, this application rate is equal to a copper sulfate ($CuSO_4$) concentration of 0.6 mg/L or a copper (Cu) concentration of 0.2 mg/L.

27. Copper is identified as a priority pollutant in the NTR and CTR. The CTR includes the Ambient Water Quality Criteria for the Protection of Aquatic Life for copper. The Criterion Maximum Concentration (CMC), a 1-hour average, and Criterion Continuous Concentration (CCC), a 4-day average, are hardness dependent. The criteria are expressed in terms of the dissolved fraction of the metal in the water column and are calculated from the total recoverable values by applying a conversion factor. The conversion factor in the CTR is 0.96 for both acute (CMC) and chronic (CCC) criteria.

The chronic and acute criteria of the CTR for copper, expressed as total recoverable

metal, for the protection of fresh water aquatic life at various receiving water hardness concentrations are as follows.

Receiving Water Hardness (mg/L $CaCO_3$)	Chronic Criterion (mg/L)	Acute Criterion (mg/L)
50	0.005	0.007
100	0.009	0.014
150	0.013	0.021
200	0.017	0.027
250	0.020	0.033

Although the Discharger did not report a receiving water hardness concentration when submitting CTR data, based on the anticipated dose rates for copper (even if diluted by in-plant flows by a factor of 20) and the aquatic life criteria of the CTR over a realistic range of receiving water hardness concentrations, there is reasonable potential for copper to be present in the discharge at levels exceeding water quality criteria. Accordingly, this Order includes WQBELs for copper.

28. Effluent limitations for copper must be expressed as a total recoverable concentration. Since a site-specific translator has not been developed for copper as described in the SIP Section 1.4.1, the USEPA conversion factor for copper of 0.96 was used for translating the dissolved copper criterion into a total recoverable effluent concentration allowance (ECA) with no dilution. The Regional Board established both an Average Monthly Effluent Limitation (AMEL) and Maximum Daily Effluent Limitation (MDEL) for copper based on procedures outlined in the SIP, as described in Attachment C.

29. 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*." Although the effluent limitations for copper are new requirements in this Order, the use of copper sulfate and subsequent discharge resulting from this use is a controllable water quality condition. If copper sulfate is used at the Facility, the Discharger should be able to manage its use to comply with the new effluent limitations and, therefore, a compliance schedule for effluent copper limitations is not included in this Order.

Non-CTR Constituents

30. The Basin Plan contains water quality objectives for pH in the form of a range of acceptable pH values (measured in standard units). In the current Order, the Regional Board established an effluent limitation in the form of an acceptable range of pH between 6.5 and 8.5 standard units for discharges to San Joaquin River. This pH limitation is carried over to this Order.

31. The DFG reports that a 37 percent formaldehyde solution (formalin - also known by the trade names Formalin-F®, Paracide-F®, PARASITE-S®) is periodically used at hatcheries as a drip treatment to control fungus on fish eggs at concentrations of 1,000 to 2,000 ppm for 15 minutes, or as a flush treatment in production units at concentrations of 170 to 250 ppm for of 1-8 hours. Formalin is approved through FDA's New Animal Drug Application (NADA) program for use in controlling external protozoa and monogenetic trematodes on fish, and for controlling fungi of the family *Saprolegniacae* in food-producing aquatic species (including trout and salmon). For control of other fungi, formalin may be used under an Investigational New Animal Drug (INAD) exemption.

If applied to one of eight production raceways/ponds at the San Joaquin Fish Hatchery at 250 ppm, this concentration would be diluted to approximately 31 ppm formalin or 11.5 ppm formaldehyde by in-plant flows before being discharged. These calculations assume that flow from the production ponds/raceways mixes completely with the bulk flow through the facility and is discharged with no consumption or breakdown of formaldehyde.

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 San Joaquin River. The DFG Pesticide Unit conducted biotoxicity studies to determine the aquatic toxicity of formalin using *Pimephales promelas* and *Ceriodaphnia dubia* in accordance with the analytical methods specified in EPA 600/4-91-002, *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*. These short-term chronic tests measure effects such as reduced growth of the organism, reduced reproduction rates, or lethality. Results were reported as a No Observed Effect Concentration (NOEC) and a Lowest Observed Effect Concentration (LOEC). The DFG Pesticide Unit also conducted acute toxicity tests using *Ceriodaphnia dubia* in accordance with methods specified in EPA 600/4-90/027, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms.* Acute toxicity test results typically are reported as the No Observed Adverse Effect Level (NOAEL), Lowest Observed Adverse Effect Level (LOAEL), and $LC_{50.}$ Results of both acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit were considered along with the Basin Plan narrative toxicity objective when determining whether WQBELs for formalin as formaldehyde are necessary.

Results of 7-day chronic toxicity tests indicated *Ceriodaphnia dubia* was the most sensitive species, with a 7-day NOEC value of 1.3 mg/l formaldehyde for survival and <1.3 mg/l for reproduction (the Regional Board used an NOEC of 1.3 mg/L). Acute toxicity tests conducted using *Ceriodaphnia dubia* showed a 96-hour NOAEL of 1.3 mg/l formaldehyde. Additional acute toxicity tests with *Ceriodaphnia dubia* were conducted

using only an 8-hour exposure, resulting in a 96-hour NOAEL concentration of 6.7 mg/L formaldehyde. Based on the results of these toxicity tests and estimates of potential discharges of formaldehyde from the facility, if formalin is used at this Facility in the future at the DFG reported dose rates, formaldehyde may be discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion from the narrative water quality objective for toxicity from the Basin Plan. Accordingly, this Order includes WQBELs for formaldehyde. Effluent concentrations of formaldehyde may persist because of potential application procedures (e.g., successive raceway treatments, drip treatments for eggs) and due to retention of effluent in the settling ponds. Therefore, as shown in the Information Sheet, both an average monthly effluent limitation of 0.65 mg/L and a maximum daily effluent limitation of 1.3 mg/L were calculated based on the 96-hour NOAEL value and using the procedure in USEPA's TSD for calculating WQBELs. The previous Order included limitation for formaldehyde of 0.02 mg/L not to be exceeded at any time based on the California Proposition 65 Regulatory Level as a Water Quality Criterion. There is no USEPA or California MCL for formaldehyde. Based on the new information from DFG toxicity tests, the lack of an MCL to interpret chemical objectives from the Basin Plan, and to maintain consistency with permit requirements for similar CAAP facilities in the Region, the Regional Board has determined that it is appropriate to revise the formaldehyde limitations in this Order. This change is consistent with the Federal anti-backsliding provisions of 40 CFR 122.44(l)(1) and 122.62(a)(2). The effluent limitations in this Order will ensure protection of aquatic life against effects from exposure to formaldehyde in the Discharge. These effluent limitations are included in this Order and have been established for protection of aquatic life against toxic effects from exposure to formaldehyde in the discharge.

32. DFG reports that sodium chloride (salt) may be used at the San Joaquin Fish Hatchery as a flush treatment at an application rate of up to 700 pounds per cfs. If salt is applied to only one of eight production ponds/raceways and allowed to dissipate in the discharge before it is applied to a second production pond/raceway (i.e. salt concentration is diluted by a factor of eight within the hatchery), this application rate corresponds to the following salt concentrations in the discharge, when the discharge of the total quantity of salt applied occurs over a period of one to four hours. Estimates of specific conductivity contributed to the discharge are also presented, based on the assumption that conductivity (µmhos/cm) will be approximately 60 percent of the TDS concentration (mg/L).

Duration of Discharge	Possible Salt (NaCl) Concentration in the Discharge	Possible Specific Conductivity in the Discharge Attributable to Sodium Chloride
1 hour	390 mg/L	230 µmhos/cm
2 hours	195 mg/L	120 µmhos/cm
3 hours	130 mg/L	80 µmhos/cm
4 hours	100 mg/L	60 µmhos/cm

The Basin Plan, at Table III-3, includes a not-to-be-exceeded water quality objective for salinity in the San Joaquin River below Friant Dam to Mendota Pool expressed as 150 µmhos/cm specific conductivity. Due to limited information about specific applications of salt at the San Joaquin Fish Hatchery, there is not sufficient information to determine whether there is a reasonable potential that the discharge will cause or contribute to an excursion above the applicable water quality objective for salinity. This Order requires reporting the use of sodium chloride and monitoring data for conductivity as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information, and other information as it becomes available, and this Order may be reopened to establish effluent limitations for conductivity, if necessary.

33. The DFG reports that a 35 percent solution of hydrogen peroxide (H_2O_2) at dose rates of up to 100 ppm for the control of external parasites. Hydrogen peroxide is typically used as a short-term immersion bath treatment in holding tanks, or as a raceway flush treatment. FDA considers hydrogen peroxide to be an LRP drug when used to control fungi on fish at all life stages, including eggs. Hydrogen peroxide may also be used under an INAD exemption to control bacterial gill disease in various fish, fungal infections, external bacterial infections, and external parasites. When used as a one-hour treatment at 100 ppm in only one raceway at a time, a discharge concentration of 12.5 ppm hydrogen peroxide solution (4.4 ppm H_2O_2) is possible based on dilution by a factor of eight); however, hydrogen peroxide will react rapidly with organic matter in the flow through the hatchery and any residual concentration in the discharge will likely be lower. Hydrogen peroxide is a strong oxidizer that breaks down into water and oxygen; however, it exhibits toxicity to aquatic life during the oxidation process. Results of a single acute toxicity test conducted by the DFG Pesticide Unit using *C. dubia* showed a 96-hour NOAEL of 1.3 mg/L. Since there is limited toxicity information available at this time and no information regarding actual discharge concentrations of hydrogen peroxide, this Order does not include WQBELs for hydrogen peroxide. The Order does require reporting of use and monitoring information, as specified in the attached Monitoring and Reporting Program. Results of additional toxicity testing must also be submitted as specified in Provision No. 6. The Regional Board will review this information, and other information as it becomes available and this Order may be reopened to establish effluent limitations for hydrogen peroxide based on additional use and toxicity information.

34. Potassium permanganate (also known by the trade name of Cairox^{TM}) may be used to control gill disease as a 1-hour flush treatment in a single raceway at up to 5 mg/L resulting in an estimated discharge of 0.6 mg/L potassium permanganate. These calculations assume the flow from the raceway receiving treatment mixes completely with the entire flow through the facility and is discharged with no further concentration, breakdown, or dilution of potassium permanganate. Potassium permanganate has a low estimated lifetime in the environment, being readily converted by oxidizable materials to insoluble manganese dioxide (MNO_2). In non-reducing and non-acidic environments, MNO_2 is insoluble and has a very low bioaccumulative potential. Potassium permanganate is not approved for use in aquaculture under FDA's NADA program and

should therefore be used in accordance with an INAD exemption granted by FDA. Potassium permanganate is typically applied in a single, short-term treatment, or as a series of closely-spaced, short-term treatments. Results of a single acute toxicity test conducted by the DFG Pesticide Unit using *C. dubia* showed a 96-hour NOAEL of 0.25 mg/L for potassium permanganate. Since there is limited toxicity information available at this time and no information regarding actual discharge concentrations of potassium permanganate, this Order does not include WQBELs for potassium permanganate. The Order, however, requires reporting of use and monitoring information, as specified in the attached Monitoring and Reporting Program. Results of additional toxicity tests must also be submitted as specified in Provision No. 6. The Regional Board will review this information, and other information as it becomes available, and this Order may be reopened to establish effluent limitations for potassium permanganate based on additional use and toxicity information.

35. The DFG reports that iodine, either as PVP Iodine solution or as Iodophor may be used at the San Joaquin Fish Hatchery. Iodophor is used at a dose rate of 100 mg/L to disinfect and control diseases on fish eggs. Based on typical application rates, PVP Iodine may be present in fish hatchery discharge at concentrations near 0.8 mg/L or 0.08 mg/L PVP Iodine Complex. Because this material is applied in short-term treatments of 1 hour or less, results of acute aquatic life toxicity testing conducted by the DFG Pesticide Unit were considered when determining whether WQBELs for PVP Iodine and Iodophor were necessary in this Order. Results of a single acute toxicity test conducted by DFG with *Ceriodaphnia dubia* showed a 96-hour NOAEL of 0.86 mg/L. Due to limited application information and limited toxicity data for these iodine containing materials and the lack of information regarding actual discharge concentrations, the Regional Board cannot determine that these materials are discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion from a narrative water quality objective for toxicity from the Basin Plan. This Order does not include WQBELs for PVP Iodine or Iodophor; however, use information and monitoring data must be reported as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information, and other information as it becomes available, and this Order may be reopened to establish effluent limitations for the iodine containing materials based on additional use and toxicity information.

36. Chloramine-T is not currently used but may be used by the Discharger in the future as a possible replacement of copper and formalin. Chloramine-T is available for use in accordance with an INAD exemption by FDA. DFG reports that chloramine-T may be used at a rate of 10 ppm for one-hour flush treatment in a single raceway resulting in an estimated maximum concentration in the discharge of 1.3 mg/L. These calculations assume the flow from the raceways mixes completely with the volume of water in the settling basin and is discharged with no further concentration, breakdown, or dilution of chloramine-T. Chloramine-T breaks down into para-toluenesulfonamide (p-TSA) and unlike other chlorine based disinfectants does not form harmful chlorinated compounds. The Discharger has not conducted biotoxicity tests using chloramine-T, however results

of toxicity testing from other sources show a 96-hour LC_{50} for rainbow trout of 2.8 mg/L. The 48-hour NOEC for *Daphnia magna* was reported as 1.8 mg/L. The DFG Pesticide Unit is proposing to conduct additional toxicity testing on chloramine-T to determine NOAEL concentrations. Since there is limited toxicity information available and no information regarding actual discharge concentrations of chloramine-T, this Order does not include water quality-based effluent limitations for chloramine-T. However, use and monitoring of chloramine-T must be reported as specified in the attached Monitoring and Reporting Program and results of additional toxicity tests must be submitted as specified in Provision No. 6. The Regional Board will review this information, and other information as it becomes available and this Order may be reopened to establish effluent limitations based on additional use and toxicity information.

37. The DFG reports that the anesthetic, Tricaine methanesulfonate, commonly known as MS-222 (with trade names of Finquel® or Tricaine-S®) may be used in the future at the Facility. MS-222 has been approved by FDA for use as an anesthetic for Salmonidae. It is intended for the temporary immobilization of fish, amphibians and other aquatic, cold-blooded animals. It has been recognized as a valuable tool for the proper handling of these animals during manual spawning (fish stripping), weighing, measuring, marking, surgical operations, transport, photography, and research. In the future, the Discharger may also use the anesthetic Aqui-S®. Aqui-S® is a water dispersible liquid anaesthetic for fin fish, crustacea and shell fish and is used in the US under an INAD exemption. The Regional Board does not have specific toxicity information for MS-222 or Aqui-S® or estimates of potential discharge concentrations of MS-222 and Aqui-S® at this Facility. Since there is limited toxicity information available at this time and no information regarding actual discharge concentrations of MS-222 or Aqui-S®, this Order does not include water quality-based effluent limitations for MS-222 or Aqui-S®. However, use and monitoring of MS-222 and Aqui-S® must be reported as specified in the attached Monitoring and Reporting Program and results of additional toxicity tests must be submitted as specified in Provision No. 6. The Regional Board will review this information, and other information as it becomes available, and this Order may be reopened to establish effluent limitations based on additional use and toxicity information. Furthermore, this Order includes a requirement that all aquaculture drugs and chemicals not discharged to receiving waters be disposed of in an environmentally safe manner according to label guidelines, Material Safety Data Sheet guidelines, and BMPs. Any other form of disposal requires approval from the Executive Officer.

38. In the future, the facility may periodically use the antibiotics oxytetracycline and penicillin G as therapeutic agents in bath treatments to control fish diseases. The Regional Board does not have estimates of the concentrations of oxytetracycline and penicillin G that could be present in effluent from the Facility.

Oxytetracycline, also known by the brand name Terramycin®, is an antibiotic approved through FDA's NADA program for use in controlling ulcer disease, furunculosis, bacterial hemorrhagic septicemia, and pseudomonas disease in salmonids.

Oxytetracycline is most commonly used at CAAP facilities as a feed additive. However, oxytetracycline may also be used as an extra-label use under a veterinarian's prescription in an immersion bath of approximately six to eight hours in duration. Because oxytetracycline may be applied in an immersion bath for up to eight hours at a time, the Regional Board considered the results of acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limitations for oxytetracycline used in an immersion bath treatment were necessary in this Order. Results of acute toxicity tests using *C. dubia* showed a 96-hour NOAEL of 40.4 mg/L. Results of chronic toxicity tests using *C. dubia* showed a 7-day NOEC for reproduction of 48 mg/L. For DFG facilities in the Region where the Regional Board has available estimated discharge concentrations of oxytetracycline, the estimated discharge of oxytetracycline is well below the lowest NOEC and NOAEL. Therefore, at this time, oxytetracycline, when used in an immersion bath treatment, is not discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of a narrative water quality objective for toxicity from the Basin Plans. Accordingly, this Order does not include an effluent limitation for oxytetracycline. However, monthly use of oxytetracycline must be reported as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information, and other information as it becomes available, and this Order may be reopened to establish effluent limitations based on additional use and toxicity information.

Penicillin G, also known as Pen-G, is an antibiotic used in a six to eight hour immersion bath treatment to control acute disease outbreaks. Penicillin G is not approved under FDA's NADA program and its' extra-label use in aquaculture requires a veterinarian's prescription. Due to the length of treatment time (up to eight hours), the Regional Board considered the results of acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limitations for penicillin G were necessary in this Order. Results of acute toxicity tests using *C. dubia* showed a 96-hour NOAEL of 890 mg/L. Results of 7-day chronic toxicity testing using *Pimephales promelas* showed 7-day NOEC for survival of 350 mg/L. For DFG facilities in the Region where the Regional Board has available estimated discharge concentrations of penicillin G, the estimated discharge of penicillin G is well below the lowest NOEC and NOAEL. Therefore, at this time, penicillin G, when used in an immersion bath treatment, is not discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of a narrative water quality objective for toxicity from the Basin Plans. Accordingly, this Order does not include an effluent limitation for penicillin G. However, monthly use of penicillin G must be reported as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information, and other information as it becomes available, and this Order may be reopened to establish effluent limitations based on additional use and toxicity information.

39. The antibiotics oxytetracycline, Romet-30® (sulfadimethoxine, ormetoprim), and florfenicol may potentially be used by the Discharger in feed formulations to control

acute disease outbreaks. Erythromycin (injected or used in feed formulations) and amoxycillin (injected) also are antibiotics that may be used in the future to control disease. These antibiotics must be used under conditions in the NADA approval (oxytetracycline and Romet-30®) or an INAD exemption or a veterinarian's prescription for extra-label use. In the NPDES General Permit for Aquaculture Facilities in Idaho (Idaho General Permit), USEPA Region 10 distinguishes between antibiotics applied in feed formulations and antibiotics applied in immersion baths. The Idaho General Permit concludes that drugs or chemicals administered via feed, and ingested by fish, pose little threat to aquatic life or beneficial uses because a majority of the drug is utilized by the fish, though some literature suggests otherwise. As stated in the Idaho General Permit, "USEPA believes that disease control drugs and other chemicals provided for ingestion by fish do not pose a risk of harm or degradation to aquatic life or other beneficial uses." Based on similar conclusions as those drawn by USEPA for the Idaho General Permit, the Regional Board has determined that oxytetracycline, Romet-30®, and florfenicol, (when used in feed formulations), erythromycin (when injected or used in feed formulations) and amoxycillin (when injected) are used in a manner that reduces the likelihood of direct discharge to waters of the United States or waters of the State, particularly when Dischargers implement BMPs, as required by this Order. Therefore, oxytetracycline, Romet-30®, and florfenicol, (when used in feed formulations), erythromycin (when injected or used in feed formulations) and amoxycillin (when injected) are not likely to be discharged from the Facility at levels that would cause, have the reasonable potential to cause, or contribute to an excursion of Basin Plan narrative water quality objectives for toxicity. Accordingly, this Order does not include water quality-based effluent limitations for these substances; however, it does require reporting use as specified in the attached Monitoring and Reporting Program. If, in the future, additional information becomes available regarding the use or toxicity of any of these substances, the Regional Board will re-evaluate whether its discharge may cause, have the reasonable potential to cause, or contribute to an excursion of Basin Plan objectives for toxicity and, if necessary, re-open this Order to include numeric effluent limitations.

40. Carbon dioxide gas is used to anesthetize fish prior to spawning. Sodium bicarbonate, or baking soda, also is used as a means of introducing carbon dioxide into the water to anesthetize fish. Acetic acid is used for the control of external parasites. These substances may be discharged from the Facility in the future. FDA considers these substances LRP drugs for use in aquaculture. Based upon available information regarding the use of these substances at CAAP facilities in the Region, the Regional Board does not believe that carbon dioxide gas, sodium bicarbonate, or acetic acid will be discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of Basin Plan narrative water quality objectives for toxicity. Accordingly, this Order does not include water quality-based effluent limitations for any of these substances; however, use of these substances their use must be reported as specified in the attached Monitoring and Reporting Program. In the future, as additional information becomes available regarding the use or toxicity of carbon dioxide gas, sodium bicarbonate, or acetic acid, the Regional Board will re-evaluate whether the discharge of

any of these substances to receiving waters may cause, have the reasonable potential to cause, or contribute to an excursion of the Basin Plan objectives for toxicity and, if necessary, re-open this Order to include numeric effluent limitations.

41. The Discharger has indicated that it may use a vibrio vaccine and an enteric redmouth bacertin in the future. Vibrio vaccine may be used as an immersion or an injectable vaccine and helps protect salmonid species from vibriosis disease caused by Vibrio anguillarum serotype I and Vibrio ordalii. Vibrio vaccine stimulates the fish's immune system to produce protective antibodies, helping the animal defend itself against vibriosis. Enteric redmouth (or yersiniosis) bacertins are formulated from inactivated Yersinia ruckeri bacteria and may also be used as an immersion or vaccine to help protect salmonid species from enteric redmouth disease caused by Yersinia ruckeri. These bacertins stimulate the fish's immune system to produce protective antibodies. These veterinary biologics are licensed for use by the US Department of Agriculture's (USDA's) Center for Veterinary Biologics. Veterinarians should be consulted before beginning an immunization program. According to USDA, most biologics leave no chemical residues in animals and most disease organisms do not develop resistance to the immune response by a veterinary biologic. Based upon available information regarding the use of these substances at CAAP facilities, the Regional Board does not believe that vibrio vaccine or enteric redmouth bacertins, when used according to label and veterinarian instructions, are discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of Basin Plan narrative water quality objectives for toxicity. Accordingly, this Order does not include water quality-based effluent limitations for these substances; however, use of these substances must be reported as specified in the attached Monitoring and Reporting Program. In the future, as additional information becomes available regarding the use or toxicity of these biologics, the Regional Board will re-evaluate whether the discharge of any of these substances to receiving waters may cause, have the reasonable potential to cause, or contribute to an excursion of the Basin Plan objectives for toxicity and, if necessary, re-open this Order to include numeric effluent limitations.

42. The Fresno County Community Health Department regulates the treatment and disposal of domestic wastewater from the office and hatchery buildings to an on-site septic tank and leach field system.

43. Because USEPA regulations require effluent limitations for all pollutants that 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, this Order includes provisions that require on going submittal of information necessary to determine reasonable potential; to calculate effluent limits; and to reopen the Order to include additional effluent limitations, if necessary.

OTHER CONSIDERATIONS

44. California Water Code Section 13267 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.*" California Water Code Section 13383 states in part, "a regional board may establish monitoring, inspection, entry, reporting, and record keeping requirements . . . for any person who discharges pollutants . . . to navigable waters." The attached Monitoring and Reporting Program No. R5-2004-0118, a part of this Order, is necessary to assure compliance with waste discharge requirements. The attached Monitoring and Reporting Program is established pursuant to California Water Code Sections 13267 and 13383.

45. 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.

46. Best Management Practices plan requirements are established based on requirements in Effluent Limitations Guidelines and New Source Performance Standards for the Concentrated Aquatic Animal Production Point Source Category at 40 CFR Part 451.

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

48. The action to adopt an NPDES permit is exempt from the provisions of the California Environmental Quality Act (CEQA), Public Resources Code Section 21000, et seq., in accordance with Section 13389 of the California Water Code.

49. 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.

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

51. This Order shall serve as an NPDES permit pursuant to Section 402 of the CWA, and amendments thereto, and shall take effect upon the date of hearing, provided USEPA has no objections.

IT IS HEREBY ORDERED that Order No. 97-001 is rescinded and that the California Department of Fish and Game, their 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 requirements, when discharging from the San Joaquin Fish Hatchery:

A. Discharge Prohibitions

1. Discharge of wastes in a manner other than as described in this Permit, or at a location different from that described in the Findings is prohibited, and may be considered a violation of the Clean Water Act and the California Water Code.

2. The by-pass or overflow of untreated wastewater or wastes into any surface water or surface water drainage course is prohibited, except as allowed by Standard Provision A.13.

3. Discharge of waste classified as "hazardous" as defined in §2521(a) of Title 23, California Code of Regulations (CCR), §2510, et seq., (hereafter Chapter 15), or "designated", as defined in §13173 of the California Water Code, is prohibited.

4. Practices that allow accumulated sludge, grit, and solid residues to be discharged to surface waters or surface water drainage courses are prohibited.

5. The discharge of domestic sanitary wastes to surface waters is prohibited.

B. Effluent Limitations – Discharge 001

1. The monthly average flow shall not exceed 24 million gallons.

2. Effluent from Discharge 001 shall not exceed the following limitations:

Constituent	Units	Average Monthly Limit	Maximum Daily Limit
TSS (net) [1]	mg/L	5	15
Settleable Solids	ml/L	0.1	0.2
Formaldehyde	mg/L	0.65	1.3
Copper (Total Recoverable)[2]	µg/L	Calculate limit based on Attachment C	

[1] Effluent limitations for total suspended solids are net values
(Net TSS concentration = Effluent TSS concentration – Influent TSS concentration)

[2] A daily maximum or monthly average total recoverable copper concentration shall be considered

non-compliant with the applicable effluent limitation only if it exceeds the appropriate effluent limitation and the reported minimum level (ML). The highest acceptable ML for calibration purposes is 0.5 µg/L. Effluent hardness must be measured concurrently with effluent copper concentration to determine the appropriate effluent limitation.

3. The discharge shall not have a pH less than 6.5 nor greater than 8.5. If the effluent pH is less than 6.5, it shall not be less than the concurrent influent pH. If the effluent pH is greater than 8.5, it shall not be greater than the concurrent influent pH.

C. Discharge Specifications

1. The discharge shall not cause the degradation of any water supply or ground water.

2. Neither the treatment nor the discharge shall cause a nuisance or conditions of pollution as defined by California Water Code §13050.

D. Best Management Practices Plan

Within 12 months of adoption of this Order, the Discharger shall certify in writing to the Regional Board that it has developed a Best Management Practices (BMP) plan. The Discharger shall develop and implement the BMP plan to prevent or minimize the generation and discharge of wastes and pollutants to the waters of the United States and waters of the State. The Discharger shall develop and implement a BMP plan consistent with the following objectives:

1. Solids Management

   a. Conduct fish feeding in raceways in a manner that limits feed input to the minimum amount reasonably necessary to achieve production goals and sustain targeted rates of aquatic animal growth and minimizes the discharge of unconsumed food and waste products to surface waters.

   b. Clean raceways using procedures and at frequencies that minimize the disturbance and subsequent discharge of accumulated solids during routine activities such as inventorying, grading, and harvesting.

   c. Report the final disposition of all other solids and liquids, including aquaculture drugs and chemicals, not discharged to surface waters in the effluent.

   d. Collect, store, and dispose of fish mortalities and other solids in an environmentally safe manner and in manner so as to minimize discharge to waters of the United States or waters of the State.

2. Operations and Maintenance

a. Maintain in-system production and wastewater treatment technologies to prevent the overflow of any floating matter or bypassing of treatment technologies.

b. Inspect the production system and the wastewater treatment system on a routine basis in order to identify and promptly repair any damage.

c. Ensure storage and containment of drugs, chemicals, fuel, waste oil, or other materials to prevent spillage or release into the aquatic animal production Facility, waters of the United States, or waters of the State.

d. Implement procedures for properly containing, cleaning, and disposing of any spilled material.

e. Prevent fish from being released within the FDA-required withdrawal time of any drug or chemical with which they have been treated.

3. Training

a. Adequately train all relevant facility personnel in spill prevention and how to respond in the event of a spill in order to ensure the proper clean-up and disposal of spilled material.

b. Train staff on the proper operation and cleaning of production and wastewater treatment systems, including training in feeding procedures and proper use of equipment.

The Discharger shall ensure that its operations staff are familiar with the BMP Plan and have been adequately trained in the specific procedures it requires.

E. Waste Disposal

1. Collected screenings, sludges, and other solids, including fish carcasses, 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. All aquaculture drugs and chemicals not discharged to receiving waters in accordance with the provisions of this Order shall be disposed of in an environmentally safe manner, according to label guidelines, Material Safety Data Sheet guidelines and BMPs. Any other form of disposal requires approval from the Executive Officer.

3. Any proposed change in disposal practices, shall be reported to the Executive Officer at least **90 days** in advance of the change.

F. Receiving Water Limitations for the San Joaquin River

Receiving water limitations for the San Joaquin River are site-specific interpretations of the Basin Plan; and as such, they are a required part of this Order. A receiving water condition not in conformance with the limitation, however, is not necessarily a violation of the Order. The Regional Board may require an investigation to determine cause and culpability prior to asserting a violation has occurred.

The discharge shall not cause the following conditions in the San Joaquin River:

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

2. Oils, greases, waxes, or other materials 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.

3. The normal ambient pH to fall below 6.5, exceed 8.5, or change by more than 0.5 units.

4. Floating material (liquids, solids, foams, and scums), or suspended material in amounts that cause nuisance or adversely affect beneficial uses.

5. Aesthetically undesirable discoloration or discoloration that causes nuisance or adversely affects beneficial uses.

6. Biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses..

7. Changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to discharges from the San Joaquin River Fish Hatchery that exceed:

    a. 1 NTU when background turbidity is between 0 and 5 NTUs;

    b. 20 percent when background turbidity is between 5 and 50 NTUs;

    c. 10 NTUs when background turbidity is between 50 and 100 NTUs; and

d. 10 percent when background turbidity is greater than 100 NTUs.

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

9. Suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

10. Alteration of the discharge rate of suspended sediments so as to cause nuisance or adversely affect beneficial uses.

11. Increases in the normal ambient temperature of waters by more than 5º F (3º C).

12. Taste or odor-producing substances that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance or adversely affect beneficial uses.

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

14. Degradation of aquatic communities and populations, including vertebrate, invertebrate, and plant species.

15. Toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances..

16. Chemical constituents in concentrations that adversely affect beneficial uses, including chemical constituents at concentrations in excess of the maximum contaminant levels specified in Title 22 of the California Code of Regulations.

17. Pesticides, individually or in combination, in concentrations that adversely affect beneficial uses or that concentrate in bottom sediments or aquatic life so as to adversely affect beneficial uses.

18. Violation of any applicable water quality standard for receiving waters adopted by the Regional Board or the SWRCB pursuant to the CWA and regulations adopted thereunder.

G. Provisions

1. The Discharger shall comply with the attached Monitoring and Reporting Program No. R5-2004-0118, which is part of this Order, and any revisions thereto, as ordered by the Executive Officer. If sufficient information is collected and indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numerical water quality standard, then this Order may be reopened to include effluent limitation(s) to achieve water quality standards. Additionally, if pollutants are detected in discharges from the Discharger's facility, but insufficient information exists to establish an effluent limitation or determine if an effluent limitation is necessary, then the Discharger may be required to conduct additional monitoring to provide sufficient information.

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

2. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)," dated February 2004, which are part of this Order. This attachment and its individual paragraphs are referred to as Standard Provisions(s).

3. The Discharger shall comply with the standards contained in the Health and Safety Code, Chapter 6.67, Aboveground Storage of Petroleum.

4. In accordance with the requirements in Section D. – Best Management Practices (BMP) Plan, of this Order, the Discharger shall develop and implement a BMP Plan which achieves the objectives and the specific requirements outlined in that section of the Order. Through implementation of a BMP Plan, the Discharger shall prevent or minimize the generation and discharge of wastes and pollutants from the Facility to the waters of the United States. In the BMP Plan, each component of the Facility shall be evaluated by the Discharger for its waste minimization opportunities and its potential for causing a release of significant amounts of pollutants to receiving waters due to the failure or improper operation of equipment. The examination shall include all normal operations, including raw material and product storage areas, feeding of fish, internal movement of fish, cleaning of rearing/holding units and settling systems, processing and product handling areas, loading or unloading operations, spillage or leaks from the processing floor and dock, and sludge and waste disposal. The BMP Plan shall contain an explicit quantification of the inputs and outputs of the Facility, including fish, feed, feed components, mortalities due to predation and disease, dissolved and solid pollutants, and water. The BMP Plan shall contain a description of specific management practices and standard operating procedures used to achieve the above objectives, including, for example, schedules for solids removal from each waste collection component including what procedures will be used to

determine when cleaning is necessary to prevent accumulated solids from being discharged. The BMP Plan shall contain a statement that the BMP Plan has been reviewed and endorsed by the Facility Manager and the individuals responsible for implementation of the BMP operating plan. The Discharger shall ensure that its operations staff is familiar with the BMP Plan and have been adequately trained in the specific procedures which it requires. The Discharger shall maintain a copy of the BMP Plan at the Facility and shall make the plan available upon request to representatives of the Regional Board.

5. This Order authorizes the discharge of formalin (formaldehyde), sodium chloride, hydrogen peroxide, potassium permanganate, PVP iodine, chloramine-T, MS-222, Aqui-S®, oxytetracycline, penicillin G, Romet-30®, florfenicol, erythromycin, amoxycillin, carbon dioxide, sodium bicarbonate, acetic acid, vibrio vaccine, and enteric redmouth bacertin to the San Joaquin River in accordance with the effluent limitations and other conditions herein. The Discharger shall submit to the Regional Board in writing the following information prior to the use of any other chemical or aquaculture drug that may enter the wastewater discharge:

   a. The common name(s) and active ingredient(s) of the drug or chemical proposed for use and discharge.
   b. The purpose for the proposed use of the drug or chemical (i.e. list the specific disease for treatment and specific species for treatment).
   c. The amount proposed for use and the resulting calculated estimate of concentration in the discharge.
   d. The duration and frequency of the proposed use.
   e. Material Safety Data Sheets and available toxicity information.
   f. Any related Investigational New Animal Drug (INAD), New Animal Drug Application (NADA) information, extra-label use requirements and/or veterinarian prescriptions.

   Prior to discharging the chemical or aquaculture drug, the Discharger also shall conduct and/or submit the results of acute toxicity test information on any new chemical or drug in accordance with *EPA-821-R-02-012,* Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, Fifth Edition, October 2002*, using *C. dubia,* to determine the NOAEL, and LOAEL.

   If the toxicity testing, or above listed information submitted to the Regional Board indicates that the drug or chemical is, or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an in-stream excursion above any chemical-specific water quality criteria, narrative water quality objective for chemical constituents from the Basin Plan, or narrative water quality objective for toxicity from the Basin Plan, this Order may be reopened to established effluent limitations.

6. The Discharger shall conduct short term toxicity studies in accordance with methods specified in *EPA-821-R-02-012*, to determine the NOAEL, and LOAEL for hydrogen peroxide, potassium permanganate, PVP iodine, chloramine-T, MS-222, and Aqui-S® to reflect concentrations and exposure times that are applicable to this facility. The results shall be submitted to the Regional Board **within 12 months of adoption of this Order**. The Regional Board will review this information and this permit may be reopened to establish effluent limits based on additional use and toxicity information.

7. The Discharger may conduct studies pertaining to Facility operations, the effluent discharge, and the receiving water. For example, such studies may include a mixing zone and dilution study. The Regional Board will review such studies and, if warranted, will reopen this Order to make appropriate changes.

8. **Adoption of new Minimum Level's (ML's)**: Where an approved laboratory analytical method and associated ML cannot, at this time, determine whether a CTR or NTR constituent is present in the discharge above the applicable criteria, the Discharger shall resample for these constituents if new ML's are adopted by the SWRCB.

9. The Discharger shall report promptly to the Regional Board any material change or proposed change in the character, location, or volume of the discharge.

10. A copy of this Order shall be kept at the discharge Facility for reference by operating personnel. Key operating personnel shall be familiar with its contents.

11. This Order expires on **1 September 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 an application for renewal of waste discharge requirements if it wishes to continue the discharge.

12. 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, the name, address, and the 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 10 September 2004.

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THOMAS R. PINKOS, Executive Officer

Tt:JME

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2004-0118
NPDES NO. CA0004812
FOR
STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME
SAN JOAQUIN FISH HATCHERY
FRESNO COUNTY

INTRODUCTION

This Monitoring and Reporting Program is issued pursuant to California Water Code Section 13383 and includes: influent monitoring of raw water supply, effluent monitoring of discharges to waters of the United States and waters of the State, and receiving water monitoring. All water quality samples shall be representative of the volume and nature of the discharge, or representative of the matrix of material sampled. The time, date, and location of sample collection shall be recorded on a chain of custody (COC) form. COC forms shall be completed for each sample collected and copies provided to the Regional Board with the monthly monitoring reports.

Water quality samples do not need to be taken during months when there are no pollutant discharges to surface waters resulting from aquaculture operations, or associated on-site fish processing (e.g. no monitoring is required if no fish are being held at the facility, monitoring for specific chemicals or drugs only when being used and discharged to surface waters). However, monitoring forms are still required to be submitted on a monthly basis during these periods documenting no discharge. All water quality sampling and analyses shall be performed in accordance with the Monitoring and Reporting Requirements as outlined in Section C of the Standard Provisions of this Order. Water quality sample collection, storage, and analyses shall be performed according to 40 CFR Part 136, or other methods approved and specified by the Executive Officer. Water and waste analyses shall be performed by a laboratory approved for these analyses by the State Department of Health Services (DHS).

INFLUENT MONITORING

An influent sampling station, I-001, shall be established and located where representative samples of the raw water supply can be obtained. Samples shall be collected at approximately the same time as effluent samples. Influent monitoring shall include at least the following:

Constituent	Units	Type of Sample	Sampling Frequency
Influent Flow	mgd	Calibrated meter, weir, or other approved method	Recorded weekly
Total Suspended Solids (TSS)	mg/L	grab	1/Month
Specific Conductivity @ 25º C	µmhos/cm	grab	1/Month

EFFLUENT MONITORING

Effluent samples shall be collected at Discharge 001, downstream from the last connection through which wastes can be admitted to the outfall. Effluent samples shall be representative of the volume and nature of the discharge. Time of collection of a grab sample shall be recorded. Effluent monitoring shall include the following.

Constituent	Units	Type of Sample	Sampling Frequency
Effluent Flow	cfs[1]	Calibrated meter, weir, or other approved method	Recorded Weekly
Temperature	°C	grab	1/Month
Turbidity	NTUs	grab	1/Month
Total suspended solids (TSS)	mg/L	grab	1/Month
Net TSS (Effluent – Influent)	mg/L	calculation	1/Month
Settleable solids	ml/L	grab	1/Month
Conductivity @ 25°C (Specific Conductance)[2]	µmhos/cm	grab	1/Month
Chloride[2]	mg/L	grab	1/Month
Formaldehyde[3]	mg/L	grab	1/Month during use
Copper (Total Recoverable)[4]	µg/L	grab	1/Month during use
pH[4]	pH units	grab	1/Month[5]
Hardness[4]	mg/L	grab	1/Month
PVP Iodine[6]	mg/L	grab	1/Month during use
Hydrogen peroxide [6]	mg/L	grab	1/Month during use
Potassium permanganate [6]	mg/L	grab	1/Month during use
Chloramine-T [6]	mg/L	grab	1/Month during use

1 or mgd
2 In months when salt (sodium chloride) is added to waters of the Facility, conductivity and chloride concentration shall be measured daily during sodium chloride use.
3 In months when Formalin is added to the waters of the Facility, formaldehyde concentration shall be measured during Formalin use.
4 In months when copper sulfate is added to the waters of the Facility, total recoverable copper concentration shall be measured during copper sulfate use. A daily maximum or monthly average copper concentration shall be

considered non-compliant with the applicable effluent limitation only if it exceeds the effluent limitation and the reported minimum level (ML). The highest acceptable ML for calibration purposes is 0.5 µg/l. The sample shall be collected during the time of peak discharge of copper, at least one hour after start of treatment. Effluent hardness and pH shall be measured at the same time as total recoverable copper.

[5] Daily during copper (e.g., copper sulfate) treatments only.

[6] Only monitored when chemical/drug is used. The analytical method used for PVP iodine, hydrogen peroxide, potassium permanganate, and Chloramine-T shall be approved by the Executive Officer. If no approved methods are available effluent concentrations may be determined by calculation as approved by the Executive Officer.

If the discharge is intermittent rather than continuous, then on the first day of such intermittent discharge, the Discharger shall monitor and record data for all of the constituents listed above, after which the frequencies of analysis given in the schedule shall apply for the duration of 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 collected at a depth of 6 to 12 inches below the surface and at least 10 feet away from the stream bank where the current is moving uniformly. When river conditions pose a safety hazard, receiving water samples shall be collected from the river bank. Receiving water samples shall be taken on the same day that effluent is monitored, and monitoring shall include at least the following:

Station	Description
R-001	100 feet upstream of the point of discharge
R-002	300 feet downstream from the point of discharge

Constituent	Units	Station	Sampling Frequency
Flow	mgd	R1	1/Month
Dissolved Oxygen	mg/L	R1, R2	1/Monthl
Temperature	º C	R1, R2	1/Month
pH	pH units	R1, R2	1/Month
Total Ammonia	mg/L	R1, R2	1/Month
Specific Conductivity @25º C	µmhos/cm	R1, R2	1/Month (Concurrent with Salt Use)
Hardness	mg/L $CaCO_3$	R1	1/Month
Turbidity	NTUs	R1, R2	1/Quarter

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:

Floating or suspended matter	Aquatic life
Visible films, sheens, or coatings	Fungi, limes, or objectionable growths
Discoloration	Potential; nuisance conditions
Bottom deposits	

MONTHLY DRUG AND CHEMICAL USE REPORT

Order R5-2004-0118 prohibits the discharge of aquaculture chemicals and drugs unless the Regional Board has received prior notice in accordance with Provision F.5. of Order R5-2004-0118, the following information shall be submitted for all aquaculture drugs or chemicals used at the Facility. This information shall be reported at **monthly** intervals using the appropriate Monthly Discharge Monitoring Reports:

a. The name(s) and active ingredient(s) of the drug or chemical.

b. The date(s) of application.

c. The purpose(s) for the application.

d. The method of application (e.g., immersion bath, administered in feed), duration of treatment, whether the treatment was static or flush (for drugs or chemicals applied directly to water), amount in gallons or pounds used, treatment concentration(s), and the flow in cubic feet per second (cfs) in the treatment units.

e. The total flow through the facility in cubic feet per second (cfs) to the San Joaquin River after mixing with the treated water.

f. For drugs and chemicals applied directly to water (i.e., immersion bath, flush treatment) and for which effluent monitoring is not otherwise required, the estimated concentration in the effluent at the point of discharge to the San Joaquin River.

g. The method of disposal for drugs or chemicals used but not discharged in the effluent.

Calculation of Concentration:

For drugs or chemicals used in an immersion bath, “drip” treatment, or in other direct application to waters at the facility, use the following formula to calculate concentration (C) at the point of discharge.

C = concentration of chemical or drug at the point of discharge

C = (treatment concentration) x (volume of water through treatment area during treatment time)
÷ (volume of water through facility during treatment time + volume of settling basin)

Example: Oxytetracycline concentration

C = 100.0 mg/L (oxytetracycline) x 1800 gallons of water in treatment area during 1-hour treatment
191,568 gallons of water through facility in 1-hour + 561,000 gallons of water in settling basin

C = 0.2 mg/L oxytetracycline at the point of discharge

This information shall be submitted monthly. If the analysis of this chemical use data compared with any toxicity testing results or other available information for the therapeutic agent, chemical or anesthetic indicates that the discharge may cause, have the reasonable potential to cause, or contribute to an excursion of a numeric or narrative water quality criterion or objective, the Executive Officer may require site specific whole effluent toxicity (WET) tests using *C. dubia* or reopen this Order to include an effluent limitation based on that objective.

PRIORITY POLLUTANT METALS MONITORING

The State Water Resources Control Board (SWRCB) adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Policy or SIP). The SIP states that the Regional Boards will require periodic monitoring (at least once prior to issuance and reissuance of a permit) for pollutants for which criteria or objectives apply and for which no effluent limitations have been established.

The Regional Board has determined that, based on priority pollutant data collected from this and similar facilities, discharge of priority pollutants other than metals is unlikely. Accordingly, the Regional Board is requiring, as part of this Monitoring and Reporting Program, that the Discharger monitor effluent and receiving water (at the receiving water station R-1) and analyze samples for priority pollutant metals **one time at least 180 days but no more than 365 days prior to expiration of this Order.**

The Discharger must analyze pH and hardness of the effluent and receiving water at the same time as priority pollutant metals. The priority pollutant metals for which this one-time analysis is required are as follows:

- Antimony
- Arsenic
- Beryllium
- Cadmium
- Chromium (III)
- Chromium (IV)
- Copper
- Lead
- Mercury
- Nickel
- Selenium
- Silver
- Thallium
- Zinc

Metals shall be analyzed by the USEPA methods listed below. Alternative analytical procedures may be used with approval by the Regional Board if the alternative method has the same or better detection level than the method listed.

Method Description	EPA Method	Constituents
Inductively Coupled Plasma/Mass Spectrometry (ICP/MS)	1638	Antimony, Beryllium, Cadmium, Copper, Lead, Nickel, Selenium, Silver, Thallium, Total Chromium, Zinc
Cold Vapor Atomic Absorption (CVAA)	1631	Mercury
Gaseous Hydride Atomic Absorption (HYDRIDE)	206.3	Arsenic
Flame Atomic Absorption (FAA)	218.4	Chromium VI

All priority pollutant metal analyses shall be performed at a laboratory certified by the California Department of Health Services. The laboratory is required to submit the Minimum Level (ML) and the Method Detection Limit (MDL) with the reported results for each constituent. The MDL should be as close as practicable to the USEPA MDL determined by the procedure found in 40 CFR Part 136. The results of analytical determinations for the presence of chemical constituents in a sample shall use the following reporting protocols:

a. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory.

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

c. For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration." Numerical estimates of data quality may be by percent accuracy (+ or – a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

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

REPORTING

The Discharger shall implement this monitoring program on the first day of the month following adoption of the Order. The Discharger shall submit monthly Discharge Monitoring Reports to

the Regional Board by the **first day of the second month** following sample collection. Annual monitoring reports shall be submitted by **30 January** each year. All reports submitted in response to this Order shall comply with signatory requirements of Standard Provision D.6.

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

1. A tabulation by month of the pounds of fish produced during the previous year including dates of operation and species and amount (lbs.) of fish harvested, processed, or released per month.

2. A summary of information on monthly land application and land disposal of solids and wastewater during the previous year including the type and amount of solids and wastewater that are land-applied or land disposed.

3. A summary of all feeding practices used at the facility on a monthly basis including:

    a. The name(s), type(s) and amount(s) of feed(s) used.
    b. The percent of phosphorus in the feed(s) used (as available).
    c. The method and frequency of feeding.

4. Monthly records documenting cleaning, inspections, maintenance, and repairs of all production and wastewater treatment systems.

In the event the Discharger becomes aware of a violation of the prohibitions, specifications, or limitations of this Order, the Discharger shall notify the Board by telephone within 24 hours of having knowledge of such noncompliance, and shall confirm this notification in writing within 5 days.

In the event that there is failure in or damage to the structure of an aquatic animal containment system that results in an unanticipated material discharge of pollutants to waters of the United States or waters of the State, the Discharger shall provide an oral report within 24 hours describing the cause of the failure or damage and identifying the materials that have been released to the environment as a result of the failure or damage. Within 7 days of discovery of the failure or damage, the Discharger shall provide a written report documenting the cause, the estimated time elapsed until the failure or damage was repaired, and steps being taken to prevent a recurrence.

If the Discharger monitors any pollutant more frequently than is required by this Order, the results of such monitoring shall be included in the calculation of the values required in the monthly monitoring report. Such increased frequency also shall be indicated on the monthly monitoring report.

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

10 September 2004
(Date)

Tt:JME

INFORMATION SHEET

ORDER NO. R5-2004-0118
STATE OF CALIFORNIA DEPARTMENT OF FISH AND GAME
SAN JOAQUIN FISH HATCHERY
FRESNO COUNTY

FACILITY DESCRIPTION

California Department of Fish and Game (DFG) owns and operates the San Joaquin Fish Hatchery located at 17392 Brook Trout Drive, Friant, Fresno County, California. The cold water facility raises approximately 380,000 pounds of trout annually for stocking throughout California, and during the period of maximum feeding, feeds approximately 2,500 pounds of feed per day. Incoming water is taken from the San Joaquin River at the Friant Dam and is distributed by gravity through the facility. Prior to discharge, the full flow is treated in five settling ponds, which can be operated in parallel or in series, or in an adjacent constructed wetlands area. Wastewater from the five settling ponds and the wetlands is merged and flows approximately 350 feet before discharge to the San Joaquin River immediately upstream of Lost Lake Park.

Hatchery facilities includes the intake structure at the Friant Dam; incubator trays; eight 600 feet long trout rearing ponds, broodstock ponds and a spawning house; aeration capability, and the five settling ponds and the constructed wetlands area. The facility also includes eight redwood tanks for additional growing space and special experiments; warm water ponds for rearing or holding warm water fish; food storage facilities; public restrooms; chemical storage facilities; two domestic wastewater ponds; six homes; and a septic system with a 110 foot by 150 foot leach field. During the effective period of Order No. 97-001, the Discharger constructed the leach field for treatment and disposal of approximately 3,000 gallons per day of domestic wastewater and, therefore, discontinued the use of the domestic wastewater ponds.

Current Waste Discharge Requirements (WDRs) for the San Joaquin Hatchery are established by Central Valley Regional Board Order No. 97-001 (NPDES No. CA0004812) and are issued to the DFG, as the Discharger. The facility meets the criteria for a concentrated aquatic animal production (CAAP) facility, as established by USEPA at 40 CFR 122.24.

Effluent monitoring data generated by the Discharger from 1999 - 2003 shows that levels of BOD_5 and suspended and settleable solids in discharges from the facility are consistently very low and within the limitations established by Order No. 97-001. pH is also consistently within the range of 6.5 – 8.5 required by that Order. Monitoring data from 1999 - 2003 also show an unvarying daily flow through the hatchery of 23.2 million gallons per day (mgd). Although this figure is greater than the maximum flow limitation of Order No. 97-001 (22.6 mgd), during an NPDES compliance inspection on January 22, 2003, the DFG reported the actual capacity of the gravity fed system to be 24 mgd.

During the NPDES compliance inspection on January 22, 2003, the Discharger reported that salt is the only aquaculture drug or chemical used at the hatchery.

Notices of Violation of Order No. 97-001 have been issued to the Discharger on 28 August 1998, 30 July 2001, and 2 May 2003. Violations included failures to conduct required monitoring, failures to report monitoring results, and failure to submit an Application/Report of Waste Discharge.

APPLICABLE REGULATIONS, POLICIES, AND PLANS

A cold-water concentrated aquatic animal production (CAAP) facility is defined in Title 40 of the Code of Federal Regulations (40 CFR 122.24) as a fish hatchery, fish farm, or other facility which contains, grows, or holds cold-water fish species or other cold water aquatic animals including, but not limited to, the Salmonidae family of fish (e.g. trout and salmon) in ponds, raceways, or other similar structures. In addition, the facility must discharge at least 30 calendar days per year, produce at least 20,000 pounds harvest weight (9,090 kilograms) of aquatic animals per year, and feed at least 5,000 pounds (2,272 kilograms) of food during the calendar month of maximum feeding. A facility that does not meet the above criteria may also be designated a cold water CAAP facility upon a determination that the facility is a significant contributor of pollution to waters of the United States [40 CFR 122.24(c)]. Cold water, flow-through CAAP facilities are designed to allow the continuous flow of fresh water through tanks and raceways used to produce aquatic animals (typically cold-water fish species). Flows from CAAP facilities ultimately are discharged to waters of the United States and of the State. 40 CFR 122.24 specifies that CAAP facilities are point sources subject to the National Pollutant Discharge Elimination System (NPDES) program. The Discharger's facility meets the definition of a cold-water, flow-through CAAP.

The operation of CAAP facilities may introduce a variety of pollutants into receiving waters. The U.S. Environmental Protection Agency (USEPA) identifies three classes of pollutants: (1) conventional pollutants (i.e., total suspended solids (TSS), oil and grease (O&G), biochemical oxygen demand (BOD), fecal coliforms, and pH); (2) toxic pollutants (e.g., metals such as copper, lead, nickel, and zinc and other toxic pollutants; and (3) non-conventional pollutants (e.g., ammonia-N, Formalin, and phosphorus). The most significant pollutants discharged from CAAP facilities are solids from uneaten feed, as well as fish feces that settles to the bottom of the raceways. Both of these types of solids are primarily composed of organic matter including BOD, organic nitrogen, and organic phosphorus.

Fish raised in CAAP facilities may become vulnerable to disease and parasite infestations. Various aquaculture drugs and chemicals are used periodically at CAAP facilities to ensure the health and productivity of the confined fish population, as well as to maintain production efficiency. Aquaculture drugs and chemicals are used to clean raceways and to treat fish for parasites, fungal growths and bacterial infections. Aquaculture drugs and chemicals are also used to anesthetize fish prior to spawning or prior to the annual "tagging" process. As a result of these operations and practices, drugs and chemicals may be present in discharges to waters of the United States or waters of the State.

In August 2004, USEPA promulgated Effluent Limitation Guidelines and New Source Performance Standards for the Concentrated Aquatic Animal Production Point Source Category (hereafter "ELG"). The ELG regulation establishes national technology-based effluent discharge

requirements for flow-through and recirculating systems and for net pens based on Best Practicable Control Technology Currently Available (BPT); Best Control Technology for Conventional Pollutants (BCT); Best Available Technology Economically Achievable (BAT); and New Source Performance Standards (NSPS). In its proposed rule, published on 12 September 2002, USEPA proposed to establish numeric limitations for a single constituent – total suspended solids (TSS) – while controlling the discharge of other constituents through narrative requirements. In the final rule, however, the USEPA determined that, for a nationally applicable regulation, it would be more appropriate to promulgate qualitative TSS limitations in the form of solids control best management practices (BMP) requirements. Furthermore, the final ELG does not include numeric effluent limitations for non-conventional and toxic constituents, such as aquaculture drugs and chemicals, but also relies on narrative limitations to address these constituents.

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 describes an implementation program and policies to achieve water quality objectives for all waters of the Basin. This includes plans and policies adopted by the State Water Resources Control Board (SWRCB) and incorporated by reference, such as Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California" (Resolution No. 68-16). These requirements implement the Basin Plan. The Basin Plan, as amended, designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for waters of the Basin. Pursuant to the California Water Code Section 13263(a), waste discharge requirements must implement the Basin Plan.

USEPA adopted the *National Toxics Rule* (NTR) on 22 December 1992, which was amended on 4 May 1995 and 9 November 1999, and the *California Toxics Rule* (CTR) on 18 May 2000, which was amended on 13 February 2001. These Rules contain water quality standards applicable to this discharge. The SWRCB adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Policy or SIP) on 2 March 2000, which contains policies and procedures for implementation of the NTR and the CTR.

Resolution No. 68-16 requires the Regional Board, in regulating discharges of waste, to maintain high quality waters of the State until it is demonstrated that any change in water quality will be consistent with the 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., water quality constituents in concentrations that exceed water quality objectives). Resolution 68-16 requires that discharges be regulated to meet best practicable treatment or control in order to assure that pollution or nuisance will not occur; and the highest water quality be consistently maintained for the maximum benefit to the people of the State. The Board has considered Resolution 68-16 and Federal antidegradation regulations at 40 CFR 131.12.

Regulation of Aquaculture Drugs and Chemicals

CAAP facilities produce fish and other aquatic animals in greater numbers than natural stream conditions would allow; therefore, system management is important to ensure that fish do not become overly stressed, making them more susceptible to disease outbreaks. The periodic use of various aquaculture drugs and chemicals is needed to ensure the health and productivity of cultured aquatic stocks and to maintain production efficiency.

CAAP facilities may legally obtain and use aquaculture drugs in one of several ways. Some aquaculture drugs and chemicals used at CAAP facilities in the Region are approved by the U.S. Food and Drug Administration (FDA) for certain aquaculture uses on certain aquatic species. Others have an exemption from this approval process when used under certain specified conditions. Still others are not approved for use in aquaculture, but are considered to be of "low regulatory priority" by FDA (hereafter "LRP drug"). FDA is unlikely to take regulatory action related to the use of a LRP drug if an appropriate grade of the chemical or drug is used, good management practices are followed, and local environmental requirements are met (including NPDES permit requirements). Finally, some drugs and chemicals may be used for purposes, or in a manner not listed on their label (i.e., "extra-label" use) under the direction of licensed veterinarians for the treatment of specific fish diseases diagnosed by fish pathologists. It is assumed that veterinarian-prescribed aquaculture drugs are used only for *short periods of duration* during acute disease outbreaks. Each of these methods of obtaining and using aquaculture drugs is discussed in further detail below.

It is the responsibility of those using, prescribing, or recommending the use of these products to know which aquaculture drugs and chemicals may be used in CAAP facilities in the Region under all applicable federal, State, and local regulations and which aquaculture drugs and chemicals may be discharged to waters of the United States and waters of the State in accordance with this permit. A summary of regulatory authorities related to aquaculture drugs and chemicals is outlined below.

Summary of Regulatory Authorities

FDA is responsible for ensuring the safety, wholesomeness, and proper labeling of food products; ensuring the safety and effectiveness of both human and animal drugs; and ensuring compliance with existing laws governing these drugs. The Federal Food, Drug, and Cosmetic Act (FFDCA), the basic food and drug law of the United States, includes provisions for regulating the manufacture, distribution, and the use of, among other things, new animal drugs and animal feed. FDA's enforcement activities include correction and prevention of violations, removing illegal products or goods from the market, and punishing offenders. Part of this enforcement includes testing domestic and imported aquacultural products for drug and pesticide residues.

FDA's Center for Veterinary Medicine (CVM) regulates the manufacture, distribution, and use of animal drugs. CVM is responsible for ensuring that drugs used in food-producing animals are safe and effective and that food products derived from treated animals are free from potentially harmful residues. CVM approves the use of new animal drugs based on data provided by a sponsor (usually

a drug company). To be approved by CVM, an animal drug must be effective for the claim on the label) and safe when used as directed for (1) treated animals; (2) persons administering the treatment; (3) the environment, including non-target organisms; and (4) consumers. CVM establishes tolerances and animal withdrawal periods as needed for all drugs approved for use in food-producing animals. CVM has the authority to grant investigational new animal drug (INAD) exemptions so that data can be generated to support the approval of a new animal drug.

There are several options for CAAP facilities to legally obtain and use aquaculture drugs. Aquaculture drugs and chemicals can be divided into four categories as outlined below: approved drugs, investigational drugs, unapproved drugs of low regulatory priority, and extra-label use drugs.

- ***FDA approved new animal drugs***

Approved new animal drugs have been screened by the FDA to determine whether they cause significant adverse public health or environmental impacts when used in accordance with label instructions. Currently, there are six new animal drugs approved by FDA for use in food-producing aquatic species. These six FDA-approved new animal drugs are:

1. Chorionic gonadrotropin (Chlorulun®), used for spawning;
2. Oxytetracycline (Terramycin®), an antibiotic;
3. Sulfadimethoxine-ormetoprim (Romet-30®), an antibiotic;
4. Tricaine methanesulfonate (MS-222, Finquel® and Tricaine-S), an anesthetic;
5. Formalin (Formalin-F®, Paracide F® and PARASITE-S®), used as a fungus and parasite treatment; and
6. Sulfamerazine, an antibiotic.

Each aquaculture drug in this category is approved by FDA for use on specific fish species, for specific disease conditions, for specific dosages, and with specific withdrawal times. Product withdrawal times must be observed to ensure that any product used on aquatic animals at a CAAP facility does not exceed legal tolerance levels in the animal tissue. Observance of the proper withdrawal time helps ensure that products reaching consumers are safe and wholesome.

FDA-approved new animal drugs that are added to aquaculture feed must be specifically approved for use in aquaculture feed. Drugs approved by FDA for use in feed must be found safe and effective. Approved new animal drugs may be mixed in feed for uses and at levels that are specified in FDA medicated-feed regulations only. It is unlawful to add drugs to feed unless the drugs are approved for feed use. For example, producers may not top-dress feed with a water-soluble, over-the-counter antibiotic product. Some medicated feeds, such as Romet-30®, may be manufactured only after the FDA has approved a medicated-feed application (FDA Form 1900) submitted by the feed manufacturer.

- ***FDA Investigational New Animal Drugs (INAD)***

Aquaculture drugs in this category can only be used under an investigational new animal drug or "INAD" exemption. INAD exemptions are granted by FDA CVM to permit the purchase, shipment and use of an unapproved new animal drug for investigational purposes. INAD exemptions are granted by FDA CVM with the expectation that meaningful data will be generated to support the approval of a new animal drug by FDA in the future. Numerous FDA requirements must be met for the establishment and maintenance of aquaculture INADs.

There are two types of INADs: standard and compassionate. Aquaculture INADs, most of which are compassionate, consist of two types: routine and emergency. A compassionate INAD exemption is used in cases in which the aquatic animal's health is of primary concern. In certain situations, producers can use unapproved drugs for clinical investigations (under a compassionate INAD exemption) subject to FDA approval. In these cases, CAAP facilities are used to conduct closely monitored clinical field trials. FDA reviews test protocols, authorizes specific conditions of use, and closely monitors any drug use under an INAD exemption. An application to renew an INAD exemption is required each year. Data recording and reporting are required under the INAD exemption in order to support the approval of a new animal drug or an extension of approval for new uses of the drug.

FDA Unapproved new animal drugs of low regulatory priority (LRP drugs)

LRP drugs do not require a new animal drug application (NADA) or INAD exemptions from FDA. Further regulatory action is unlikely to be taken by FDA on LRP drugs as long as an appropriate grade of the drug or chemical is used, good management practices are followed, and local environmental requirements are met (such as NPDES permit requirements contained in this Permit). LRP drugs commonly used at CAAP facilities in the Region include the following:

1. Acetic acid, used as a dip at a concentration of 1,000-2,000 mg/L for 1-10 minutes as a parasiticide for fish.
2. Carbon dioxide gas, used for anesthetic purposes in cold, cool and warm water fish.
3. Hydrogen peroxide, used at 250-500 mg/L to control fungi on all species and life stages of fish, including eggs.
4. Povidone iodine (PVP) compounds, used as a fish egg disinfectant at rates of 50 mg/L for 30 minutes during egg hardening and 100 mg/L solution for 10 minutes after water hardening.
5. Sodium bicarbonate (baking soda), used at 142-642 mg/L for 5 minutes as a means of introducing carbon dioxide into the water to anesthetize fish.
6. Sodium chloride (salt), used at 0.5-1% solution for an indefinite period as an osmoregulatory aid for the relief of stress and prevention of shock. Used as 3% solution for 10-30 minutes as a parasiticide.

FDA is unlikely to object at present to the use of these LRP drugs if the following conditions are met:

1. The aquaculture drugs are used for the prescribed indications, including species and life stages where specified.
2. The aquaculture drugs are used at the prescribed dosages (as listed above).
3. The aquaculture drugs are used according to good management practices.
4. The product is of an appropriate grade for use in food animals.
5. An adverse effect on the environment is unlikely.

FDA's enforcement position on the use of these substances should be considered neither an approval nor an affirmation of their safety and effectiveness. Based on information available in the future, FDA may take a different position on their use. In addition, FDA notes that classification of substances as new animal drugs of LRP does not exempt CAAP facilities from complying with all other federal, state and local environmental requirements, including compliance with this Permit

- ***Extra-label use of an approved new animal drug***

Extra-label drug use is the actual or intended use of an approved new animal drug in a manner that is not in accordance with the approved label directions. This includes, but is not limited to, use on species or for indications not listed on the label. Only a licensed veterinarian may prescribe extra-label drugs under FDA CVM's extra-label drug use policy. CVM's extra-label use drug policy (CVM Compliance Policy Guide 7125.06) states that licensed veterinarians may consider extra-label drug use in treating food-producing animals if the health of the animals is immediately threatened and if further suffering or death would result from failure to treat the affected animals. CVM's extra-label drug use policy does not allow the use of drugs to prevent diseases (prophylactic use), improve growth rates, or enhance reproduction or fertility. Spawning hormones cannot be used under the extra-label policy. In addition, the veterinarian assumes the responsibility for drug safety and efficacy and for potential residues in the aquatic animals.

BENEFICIAL USES

Within the Basin Plan the Regional Board states that protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning, and that disposal of wastewaters is not a prohibited use of waters of the State but merely a use that cannot be satisfied to the detriment of beneficial uses. Existing and potential beneficial uses that apply to surface waters of the Region are presented in Figure II-1 and Table II-1 of the Basin Plan. For the San Joaquin River from the Friant Dam to the Mendota Pool, the Basin Plan identifies the following beneficial uses: municipal domestic supply (MUN); stock watering (AGR) and irrigation (AGR); industrial water supply (PROC); water contact recreation (REC-1), including canoeing and rafting; non-contact water recreation (REC-2); warm and cold freshwater habitat (WARM and COLD); warm and cold water migration habitat (MIGR); warm and cold water spawning, reproduction, and/or early habitat (SPWN); and wildlife habitat (WILD).

All groundwaters of the Region are considered suitable or potentially suitable, at a minimum, for municipal and domestic supply (MUN), agricultural supply (AGR), and industrial service (IND) and industrial process supply (PRO).

REASONABLE POTENTIAL ANALYSIS AND EFFLUENT LIMITATIONS

Federal regulations at 40 CFR Section 122.44 require NPDES permits to contain effluent limitations, including technology-based and water quality standards-based limitations and limitations based on toxicity.

The federal regulations at 40 CFR 122.44 (d) (1) require effluent limitations for all pollutants that are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an in-stream excursion above a numeric water quality criterion (such as CTR criterion) or a narrative water quality criterion within a State water quality standard. These regulations also set forth a methodology for establishing effluent limitations based on narrative state water quality criteria [40 CFR 122.44 (d) (1) (vi) (A-C)].

The USEPA, SWRCB, and Regional Board have adopted or published standards that are used to implement 40 CFR 122.44. The USEPA has promulgated the CTR and NTR that established water quality criteria. The SWRCB has adopted the SIP that implements the CTR and NTR. The USEPA also has published recommended ambient water quality criteria and the Basin Plan contains numeric and narrative water quality objectives. The Basin Plan contains an Implementation Policy ("Policy for Application of Water Quality Objectives") that, in part, sets forth a process for translating narrative water quality objectives into numeric effluent limitations. The USEPA ambient water quality criteria, results of toxicity studies conducted by the California Department of Fish and Game, and the Basin Plan "Policy of Application of Water Quality Objectives" have been used to implement 40 CFR 122.44 (d) (1) (v).

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Total Suspended Solids and Settleable Solids

Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs, the Regional Board determined that numeric technology-based effluent limitations for total suspended solids (TSS) and settleable solids are appropriate. In addition, based upon application of the final ELG for CAAP facilities, the Regional Board is establishing requirements for a BMP plan.

Background

As noted above, USEPA's final ELG for the aquaculture industry does not include numeric effluent limitations on any conventional, non-conventional, or toxic constituents. Rather, USEPA promulgated qualitative limitations in the form of BMP requirements. Technology-based requirements in this Order are based on a combination of application of the ELG for BMP requirements and case-by-case numeric limitations developed using best professional judgment (BPJ) and carried over from the previous Order 97-001. These effluent limitations are 5.0 mg/L net TSS as an average monthly limitation and 15 mg/L net TSS as a maximum daily limitation; and 0.1

ml/L settleable solids as an average monthly limitation and 0.2 ml/L settleable solids as a maximum daily limitation. Section 402(o) of the CWA prohibits backsliding of effluent limitations that are based on BPJ to reflect a subsequently promulgated ELG which is less stringent. Removal of these numeric limitations for TSS and settleable solids would constitute backsliding under CWA Section 402(o). The Regional Board has determined that these numeric effluent limitations for TSS and settleable solids continue to be applicable to the Facility and that backsliding is not appropriate. These limitations are established as a means of controlling the discharge of solids from algae, silt, fish feces and uneaten feed. Previous Orders for hatcheries have expressed effluent limitations for TSS in terms of a net limitation. The Regional Board finds the use of a net TSS effluent limitation is an appropriate measure of performance and a correct interpretation of this limitation, and does not constitute backsliding (40 CFR 122.44(l)(2)(i)(B)(2)). Results of monitoring indicate the Discharger is capable of meeting these limitations. This Order does not include mass effluent limitations for TSS because there are no standards that specifically require a mass-based effluent limitation, mass of the pollutant discharged is not specifically related to a measure of operation (40 CFR 122.45(f)(iii)), and, in addition, mass-based effluent limitations for TSS are not necessary because this Order includes both concentration-based limitations and a maximum flow limitation. These changes are consistent with Federal anti-backsliding provisions of 40 CFR 122.44(l)(1) and 122.62(a)(2).

Relationship Between Technology-based and Water Quality-based Requirements

In addition to carrying over numeric technology-based requirements based on BPJ, the Regional Board considered the need for water quality-based limitations for TSS and settleable solids. The Regional Board determined that the numeric technology-based TSS and settleable solids limitations, along with the requirement for a BMP plan, are sufficient to ensure attainment of Basin Plan water quality objectives for sediment, settleable material, and suspended material.

BOD

Order No. 97-001 included technology-based effluent limitations for BOD based upon BPJ. This Order does not include limitations for BOD, as the control of TSS and settleable solids in the discharge and implementation of a Best Management Practices Plan will effectively control levels of BOD in the discharge. This determination is based on findings of USEPA Region 10 presented in its General NPDES Permit (No. ID-G13-0000) for Aquaculture Facilities in Idaho and the accompanying Fact Sheet, as well as observation and analysis of monitoring data from aquaculture facilities throughout the Central Valley Region. In addition, USEPA's proposed ELG for CAAP facilities (12 September 2002) stated that controlling TSS discharges from flow-through, CAAP facilities will effectively control BOD and nutrients. The final ELG also correlates TSS removal and BOD removal. Because of this new that has become available to the Regional Board since adoption of Order No. 97-001, effluent limitations have been removed from this Order. This change is consistent with the Federal anti-backsliding provisions of 40 CFR 122.44 (l)(2) and 122.62 (a)(16).

WATER QUALITY-BASED EFFLUENT LIMITATIONS (WQBELs)

Based on information submitted as part of the Report of Waste Discharge, in annual and monthly monitoring reports, in studies performed by and correspondence with DFG, and in independent studies, the Regional Board has found that the discharge may cause, have the reasonable potential to cause, or contribute to in-stream excursions of applicable numeric water quality criteria or water quality objectives or narrative water quality objectives for the following constituents: copper, pH, and formaldehyde.

No credit for dilution or assimilative capacity of the receiving water has been allowed by the Regional Board in establishing the proposed WQBELs of the Order. WQBELs are established to meet applicable water quality criteria at the point of discharge. Effluent limitations for these parameters are being established without benefit of dilution, as an allowance for dilution may be considered only after characterization of the receiving water flow by the Discharger to determine a dilution ratio and/or whether a dilution credit is appropriate.

CTR Constituents

The Discharger has been issued a letter pursuant to CWC Section 13267 requesting receiving water and effluent monitoring data to perform a reasonable potential analysis for the CTR pollutants. Effluent and receiving water samples collected on 11 December 2001 and analyzed for volatile and semi-volatile substances, metals, asbestos, 2,3,7,8-TCDD, and sixteen dioxin congeners. Analyses showed that none of the CTR priority pollutants were present in the discharge at levels that would cause or contribute to an in-stream excursion above a numeric water quality criterion from the CTR. In information received from DFG, however, projections of the potential use of copper sulfate at the Facility and the estimated resulting concentration of copper in the discharge indicate that there is a reasonable potential that copper may be discharged at a concentration that would cause, have the reasonable potential to cause, or contribute to an excursion above the CTR criteria for copper in the receiving water.

Copper

Copper, primarily in the forms of copper sulfate and chelated copper compounds, is used in fish hatcheries to control algae and other vegetation that is susceptible to the toxic effects of copper uptake, and it is used to control the growth of external parasites and bacteria on fish. Copper sulfate may be used at the Facility at a rate of up to 0.5 pounds copper sulfate per 1 cfs in production ponds/raceways. Applied to a single production pond/raceway and discharged over two and four-hour periods, this application rate could result in a copper concentrations of 0.03 – 0.06 mg/L in the discharge.

Calculations

Copper residual when $CuSO_4$ is applied at 0.5 lbs/cfs and discharged over a two-hour period.

- 0.5 lbs $CuSO_4$ = 0.5 lbs x 454 gm/lb x 1000 mg/gm = 227,000 mg $CuSO_4$ = 90,800 mg Cu

- 1 cfs for a two hour period = 1 cfs x 60 sec/min x 60 min/hr x 2 hr x 7.48 gal/cf x 3.785 liters/gal = 203,845 liters

- 0.5 lbs $CuSO_4$ per cfs for a two hour period = 90,800 mg Cu / 203,845 liters = 0.445 mg/L Cu

If one raceway/pond is treated at a time, then flow from that raceway will be diluted by the untreated flow from the 7 other raceways/ponds; i.e., the Cu residual will be diluted by a factor of 8.

- 0.445 mg/L Cu / 8 = 0.06 mg/L Cu

Copper residual when $CuSO_4$ is applied at 0.5 lbs/cfs and discharged over a four-hour period.

- 0.5 lbs $CuSO_4$ = 0.5 lbs x 454 gm/lb x 1000 mg/gm = 227,000 mg $CuSO_4$ = 90,800 mg Cu

- 1 cfs for a four hour period = 1 cfs x 60 sec/min x 60 min/hr x 4 hr x 7.48 gal/cf x 3.785 liters/gal = 407,690 liters

- 0.5 lbs $CuSO_4$ per cfs for a four hour period = 90,800 mg Cu / 407,690 liters = 0.222 mg/L Cu

If one raceway/pond is treated at a time, then flow from that raceway will be diluted by the untreated flow from the 7 other raceways/ponds; i.e., the Cu residual will be diluted by a factor of 8.

- 0.222 mg/L Cu / 8 = 0.03 mg/L Cu

The application rate of 0.5 lbs $CuSO_4$ / cfs would result in copper concentrations of 0.06 mg/L and 0.03 mg/L, if the discharge occurs over two and four-hour periods, respectively.

Determination of Reasonable Potential and Calculation of Effluent Limitations for Copper

Copper is identified as a priority pollutant in the NTR and CTR. The CTR includes the Ambient Water Quality Criteria for the Protection of Aquatic Life for copper. The Criterion Maximum Concentration (CMC), a 1-hour average, and Criterion Continuous Concentration (CCC), a 4-day average, are hardness dependent. The criteria are expressed in terms of the dissolved fraction of the metal in the water column and are calculated from the total recoverable values by applying a conversion factor. The conversion factor in the CTR is 0.96 for both acute (CMC) and chronic (CCC) fresh water criteria.

Although the Discharger did not report a receiving water hardness concentration when CTR data was submitted to the Regional Board, chronic and acute criteria of the CTR for copper, expressed as total recoverable metal, can be determined over a range of hardness concentrations as follows.

Receiving Water Hardness (mg/L $CaCO_3$)	Chronic Criterion (mg/L)	Acute Criterion (mg/L)
50	0.005	0.007
100	0.009	0.014
150	0.013	0.021
200	0.017	0.027
250	0.020	0.033

Comparison of possible copper concentrations in the discharge (0.03 – 0.06 mg/L, if discharged over 2 – 4 hour periods with applicable water quality criteria over a broad range of possible receiving water hardness concentrations shows that there is reasonable potential that copper in the discharge will cause an excursion from applicable water quality criteria in the San Joaquin River, and accordingly the proposed Order includes WQBELs for copper.

Once the need for effluent limitations for CTR priority pollutants has been established, the SIP requires the following steps to determine specific limitations.

- For each water quality criterion/objective, an effluent concentration allowance (ECA) is calculated from the following equation to account for dilution, and background levels of each pollutant.

  ECA = C + D (C – B), where C is the converted/adjusted water quality criterion, D is the dilution credit, and B is the ambient background concentration.

  The SIP permits an allowance for dilution only after characterization of the receiving water flow by the Discharger to determine a dilution ratio and/or whether or not a dilution credit is appropriate. In this Order, no credit is being allowed for dilution, so D equals zero, and the ECA equals C.

- For each ECA based on an aquatic life criterion, the long-term average discharge condition (LTA) is determined by multiplying the ECA times a factor (a multiplier) to account for effluent variability. The LTA is a target of treatment performance.

- LTA multipliers are determined based on a coefficient of variation (CV) and on a specified probability of occurrence. The CV is a measure of the variability of a set of data; and in the analysis for this facility, because there were fewer than 10 data points, the CV was set equal to a default value of 0.6. The LTA multipliers are based on the following equations:

  $$LTA_a = ECA_a \times \exp\left(0.5\sigma^2 - z\sigma\right)$$

$$LTA_c = ECA_c \times \exp\left(0.5\sigma_4{}^2 - z\sigma_4\right)$$

where

σ = standard deviation
CV = coefficient of variation (where $\sigma^2 = \ln (CV^2 + 1)$)
(CV = 0.6 where less than 10 data points are available)
z = z-statistic for 95th percentile probability and 99th percentile probability
ECA_a = acute effluent concentration allowance
ECA_c = chronic effluent concentration allowance
LTA_a = acute long-term average
LTA_c = chronic long-term average

From Table 1 of the SIP, the ECA multipliers for calculating LTAs at the 99th percentile occurrence probability for copper are 0.321 (acute multiplier) and 0.527 (chronic multiplier). LTAs are calculated as follows:

Sample Calculations of Long-Term Average Concentrations of Copper

	ECA (µg/L)		ECA Multiplier		LTA (µg/L)	
Receiving Water Hardness	**Acute**	**Chronic**	**Acute**	**Chronic**	**Acute**	**Chronic**
25 mg/L $CaCO_3$	3.79	2.85	0.321	0.527	1.22	1.50
50 mg/L $CaCO_3$	7.29	5.16	0.321	0.527	2.34	2.72
75 mg/L $CaCO_3$	10.7	7.3	0.321	0.527	3.43	3.85
100 mg/L $CaCO_3$	14.0	9.33	0.321	0.527	4.50	4.92
125 mg/L $CaCO_3$	17.3	11.3	0.321	0.527	5.56	5.96
150 mg/L $CaCO_3$	20.5	13.2	0.321	0.527	6.58	6.96
175 mg/L $CaCO_3$	23.7	15.5	0.321	0.527	7.61	8.17
200 mg/L $CaCO_3$	26.9	16.9	0.321	0.527	8.63	8.91
225 mg/L $CaCO_3$	30.1	18.7	0.321	0.527	9.66	9.85
250 mg/L $CaCO_3$	33.2	20.4	0.321	0.527	10.7	10.8

- Using the most limiting (the lowest) LTA, WQBELs are calculated. WQBELs include an average monthly effluent limitation (AMEL) and a maximum daily effluent limitation (MDEL). The equations used to calculate these limits are as follows:

$$LTA = \min\left(LTAa, LTAc\right)$$
$$AMEL = LTA \times \exp\left(z\sigma_n - 0.5\sigma_n{}^2\right)$$
$$MDEL = LTA \times \exp\left(z\sigma - 0.5\sigma^2\right)$$

where

LTA_a = acute long-term average

LTA_c = chronic long-term average
LTA = Most stringent long-term average
σ = Standard deviation
CV = coefficient of variation (where $\sigma^2 = \ln(CV^2 + 1)$
(CV = 0.6 where less than 10 data points are available)
z = z-statistic for 95th percentile probability (AMEL) and 99th percentile probability (MDEL)
n = number of samples per month
AMEL = average monthly effluent limitation
MDEL = maximum daily effluent limitation

AMELs and MDELs are calculated by multiplying the most limiting LTA for each pollutant times a multiplier that accounts for averaging periods and exceedance frequencies of the effluent limitations, and for the AMEL, the effluent monitoring frequency. Here, the CV was set equal to the default value of 0.6 (CV = 0.6) and the sampling frequency was set equal to 4 (n = 4). A 99th percentile occurrence probability was used to determine the MDEL multiplier and a 95th percentile occurrence probability was used to determine the AMEL multiplier. From Table 2 of the SIP, the MDEL multiplier is 3.11, and the AMEL multiplier is 1.55. Final WQBELs for copper are determined as follows.

Sample Calculations Effluent Limitations for Copper

Receiving Water Hardness	LTA	MDEL Multiplier	AMEL Multiplier	MDEL (µg/L)	AMEL (µg/L)
25 mg/L $CaCO_3$	1.22	3.11	1.55	3.8	1.9
50 mg/L $CaCO_3$	2.34	3.11	1.55	7.3	3.6
75 mg/L $CaCO_3$	3.43	3.11	1.55	11	5.3
100 mg/L $CaCO_3$	4.50	3.11	1.55	14	7.0
125 mg/L $CaCO_3$	5.56	3.11	1.55	17	8.6
150 mg/L $CaCO_3$	6.58	3.11	1.55	20	10
175 mg/L $CaCO_3$	7.61	3.11	1.55	24	12
200 mg/L $CaCO_3$	8.63	3.11	1.55	27	13
225 mg/L $CaCO_3$	9.66	3.11	1.55	30	15
250 mg/L $CaCO_3$	10.7	3.11	1.55	33	17

- Because receiving water hardness will vary, the Discharger will determine the effluent hardness and calculate the appropriate effluent limitation each time copper is sampled in the effluent. Attachment C provides the formulae for calculating effluent limitations for copper based on hardness and provides sample calculations.

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*." Although the effluent limitations for copper are new requirements in this Order, the use of copper sulfate and its subsequent discharge are controllable water quality conditions. Further, the Discharger has not reported using copper sulfate at the facility in recent

years and make preparations for its use to comply with the new effluent limitations, if necessary; and therefore, a compliance schedule for effluent copper limitations is not included in this Order.

Non-CTR Constituents

Aquaculture Drugs and Chemicals

Numeric water quality criteria, or Basin Plan numeric objectives currently are not available for most of the aquaculture drugs and chemicals used by the Discharger or potentially used, as reported by DFG, at this facility. Therefore, the Regional Board used the narrative water quality objective for toxicity from the Basin Plan and applied the Policy for "Application of Water Quality Objectives" as a basis for determining "reasonable potential" for discharges of these drugs and chemicals. This objective states, in part: "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 states that compliance with this objective will be determined by several factors, including biotoxicity tests of appropriate duration, or other analytical methods as specified by the Regional Board. (Biotoxicity testing involves measuring the toxic effects of an effluent on specified organisms according to nationally approved protocols). USEPA's TSD specifies two toxicity measurement techniques that can be employed in effluent characterization; the first is Whole Effluent Toxicity (WET) testing, and the second is chemical-specific toxicity analyses. WET testing is used most appropriately when the toxic constituents in an effluent are not completely known; whereas chemical-specific analysis is more appropriately used when an effluent contains only one, or very few, well-known constituents. Due to the nature of operations and chemical treatments at most CAAP facilities in the Region, CAAP facility effluents generally contain only one or two known chemicals at any given a time. Therefore, the Regional Board is using a chemical-specific approach to determine "reasonable potential" for discharges of aquaculture drugs and chemicals from CAAP facilities. The California Department of Fish and Game (DFG) Pesticide Unit has initiated biotoxicity studies to determine the aquatic toxicity of certain aquaculture drugs and chemicals - Formalin, hydrogen peroxide, Oxytetracycline, Penicillin G, potassium permanganate, and PVP Iodine. Besides these materials, the DFG also reports that the following aquaculture drugs and chemicals may be used at DFG CAAP facilities in the Central Valley Region: antibiotics (Florfenicol. Amoxicillin trihydrate, Erythromycin, and Romet), and chemicals (Iodophor, copper sulfate, salt, acetic acid, and Chloramine T).

Formalin as Formaldehyde

DFG reports that a 37 percent formaldehyde solution (Formalin - also known by the trade names Formalin-F®, Paracide-F®, PARASITE-S®) is periodically used at hatcheries as a drip treatment to control fungus on fish eggs at concentrations of 1,000 to 2,000 ppm for 15 minutes, or as a flush treatment in production units at concentrations of 170 to 250 ppm for 1-8 hours. Formalin is approved through FDA's New Animal Drug Application (NADA) program for use in controlling external protozoa and monogenetic trematodes on fish, and for controlling fungi of the family *Saprolegniacae* in food-producing aquatic species (including trout and salmon). For control of other fungi, Formalin may be used under an Investigational New Animal Drug (INAD) exemption.

If applied to one of eight production raceways/ponds at the San Joaquin Fish Hatchery at 250 ppm, this concentration would be diluted to approximately 31 ppm Formalin or 11.5 ppm formaldehyde by in plant flows before being discharged. These calculations assume that flow from the production ponds/raceways mixes completely with the bulk flow through the facility and is discharged with no consumption or breakdown of formaldehyde.

Calculations

A dose rate of 250 ppm Formalin applied only to one of eight production ponds/raceways would be diluted by a factor of eight, to 31 ppm, upon mixing with the flow from the other seven, untreated production ponds/raceways. Accounting for the 37 percent active strength of Formalin, approximately 11.5 ppm formaldehyde could be present in the discharge from the facility, if there is no breakdown, removal, or other loss of material within the facility.

Determination of Reasonable Potential and Calculation of Effluent Limitations for Formaldehyde

The State of California Department of Health Services (DHS) does not have a Maximum Containment Level (MCL) for formaldehyde, however the DHS historic Drinking Water Action Level is listed as 0.1 mg/L based on calculation by standard risk assessment methods, with a Modifying Factor equal to10. The USEPA Integrated Risk Information System (IRIS) lists a reference dose of 1.4 mg/L as a drinking water level. There are no recommended criteria for formaldehyde for protection of aquatic life.

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 Merced River. The DFG Pesticide Unit conducted biotoxicity studies to determine the aquatic toxicity of Formalin using *Pimephales promelas* and *Ceriodaphnia dubia* in accordance with the analytical methods specified in EPA 600/4-91-002, *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*. These "short-term chronic tests" measure effects such as reduced growth of the organism, reduced reproduction rates, or lethality. Results were reported as a No Observed Effect Concentration (NOEC) and a Lowest Observed Effect Concentration (LOEC). The DFG Pesticide Unit also conducted acute toxicity tests using *Ceriodaphnia dubia* in accordance with methods specified in EPA 600/4-90/027, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms.* Acute toxicity test results typically are reported as the No Observed Adverse Effect Level (NOAEL), Lowest Observed Adverse Effect Level (LOAEL), and $LC_{50.}$

Results of chronic toxicity tests submitted by the DFG Pesticide Unit indicated *C. dubia* was the most sensitive species with a 7-day No Observable Effect Concentration (NOEC) value of 1.3 mg/L

formaldehyde for survival and reproduction. Acute toxicity tests with *C dubia* showed a 96-hour NOAEL of 1.3 mg/L. A summary of the data submitted follows:

Species	7-day LC50 (mg/L)	LOEC (mg/L)	NOEC (mg/L)	LOAEL (mg/L)	NOAEL (mg/L)
Ceriodaphnia dubia	2.4	5.8[1] 1.3[2]	1.3[1] <1.3[2]	5.8	1.3
Pimephales promelas	23.3	9.09	2.28	--	--
Selenastrum capricornutum	<5.2	--	--	--	--

[1] Survival
[2] Reproduction

Since Formalin treatments are utilized as a batch or flush treatment which result in discharges from three to eight hours, short-term tests were conducted with *C dubia*, exposing the organisms for 2-hour and 8-hour periods, removing them from the chemical, and continuing the observation period for 7 days in clean water. The results were as follows:

Species	7-day LC50 (mg/L)	LOAEL (mg/L)	NOAEL (mg/L)
C. dubia—2-hour exposure	73.65	46.3	20.7
C. dubia—8-hour exposure	13.99	15.3	6.7

Results of both acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit were considered along with the Basin Plan narrative toxicity objective when determining whether WQBELs for Formalin as formaldehyde are necessary. Results of 7-day chronic toxicity tests indicated *Ceriodaphnia dubia* was the most sensitive species, with a 7-day NOEC value of 1.3 mg/l formaldehyde for survival and < 1.3 mg/l for reproduction (the Regional Board used an NOEC of 1.3 mg/L). Acute toxicity tests conducted using *Ceriodaphnia dubia* showed a 96-hour NOAEL of 1.3 mg/l formaldehyde. The additional acute toxicity tests with *Ceriodaphnia dubia* conduct using only an 8-hour exposure, resulted in a 96-hour NOAEL concentration of 6.7 mg/L formaldehyde.

Based on the results of DFG toxicity tests and calculation of potential discharge of formaldehyde from the facility, if Formalin is used at this Facility, formaldehyde may be discharged at levels that cause or have the reasonable potential to cause an excursion from the narrative water quality objective for toxicity of the Basin Plan. Accordingly, this Order includes WQBELs for formaldehyde. Effluent concentrations of formaldehyde may persist because of potential application procedures (e.g., successive raceway treatments, drip treatments for eggs) and due to retention of effluent in the settling basin. Therefore, both an AMEL of 0.65 mg/L and a MDEL of 1.3 mg/L were calculated based on the 96-hour NOAEL value, using the procedure in USEPA's TSD for calculating WQBELs. The previous Order included limitation for formaldehyde of 0.02 mg/L not to be exceeded at any time based on the California Proposition 65 Regulatory Level as a Water Quality Criterion. There is no USEPA or California MCL for formaldehyde. Based on the

new information from DFG toxicity tests, the lack of an MCL to interpret chemical objectives from the Basin Plan, and to maintain consistency with permit requirements for similar CAAP facilities in the Region, the Regional Board has determined that it is appropriate to revise the formaldehyde limitations in this Order. This change is consistent with the Federal anti-backsliding provisions of 40 CFR 122.44(l)(1) and 122.62(a)(2). These effluent limitations are included in the proposed Order and have been established for protection of aquatic life against toxic effects from exposure to formaldehyde in the discharge.

The Regional Board used USEPA's TSD guidance to calculate the MDEL and AMEL for formaldehyde as follows:

Assuming:

- No in-stream dilution allowance.
- Coefficient of Variation (CV) = 0.6 for the lognormal distribution of pollutant concentrations in effluent.

Effluent Concentration Allowance based on NOAEL (acute toxicity) with no dilution allowance

ECA_a = 1.3 mg/l

Effluent Concentration Allowance based on NOEC (chronic toxicity) with no dilution allowance

ECA_c = 1.3 mg/l

Long Term Average concentration based on acute ECA

LTA_a = 1.3 mg/l X 0.321 = 0.4173 mg/l
(where 0.321 = acute ECA multiplier at 99% occurrence probability and 99% confidence)

Long Term Average concentration based on chronic ECA

LTA_c = 1.3 mg/l X 0.527 = 0.6851 mg/l
(where 0.527 = chronic ECA multiplier at 99% occurrence probability and 99% confidence)

Most Limiting LTA concentration

LTA = 0.4173 mg/l

Average Monthly Effluent Limit

AMEL = LTA x 1.55
(where 1.55 = AMEL multiplier at 95% occurrence probability, 99% confidence, and n = 4)

AMEL = 0.4173 mg/l X 1.55 = **0.65 mg/l**

Maximum Daily Effluent Limit

MDEL = LTA x 3.11
(where 3.11 = MDEL multiplier at 99% occurrence probability and 99% confidence)

MDEL = 0.4173 mg/l X 3.11 = **1.3 mg/l**

Acetic Acid

Acetic acid is used for the control of external parasites with the addition of 1.5 to 2.2 gallons added as a bolus to the top of a raceway to achieve a treatment concentration of approximately 335 – 500 mg/L. If applied to one of eight production raceways/ponds at the San Joaquin Fish Hatchery, this concentration would be significantly diluted by in plant flows before being discharged. Although there is a taste and odor threshold for acetic acid in drinking water of 97 mg/L, due to in plant dilution and consumption, it is unlikely that this concentration would be exceeded in the discharge. And, because toxicity information is limited, the Regional Board cannot find that acetic acid is discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of a narrative water quality objective for toxicity from the Basin Plan. This Order does not include WQBELs for acetic acid; however, use information and monitoring data for acetic acid must be reported as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information, and other information as it becomes available, and this Order may be reopened to establish effluent limitations based on additional use and toxicity information.

PVP Iodine

DFG reports that iodine, either as PVP Iodine solution or as Iodophor may be used at the San Joaquin Fish Hatchery. Iodophor is used at a dose rate of 100 mg/L to disinfect and control diseases on fish eggs. Based on typical application rates, PVP Iodine may be present in fish hatchery discharge at concentrations near 0.8 mg/L or 0.08 mg/L PVP Iodine Complex. Because this material is applied in short-term treatments of 1 hour or less, results of acute aquatic life toxicity testing conducted by the DFG Pesticide Unit were considered when determining whether WQBELs for PVP Iodine and Iodophor were necessary in this Order.

Results of a single acute toxicity test conducted by DFG with *Ceriodaphnia dubia* showed a 96-hour NOAEL of 0.86 mg/L. Due to limited application information and limited toxicity data for these iodine containing materials, however, and the lack of information regarding actual discharge concentrations, the Regional Board cannot determine that these materials are discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion from a narrative water quality objective for toxicity from the Basin Plan. This Order does not include WQBELs for PVP Iodine or Iodophor; but use information and monitoring data must be reported as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information,

and other information as it becomes available, and this Order may be reopened to establish effluent limitations for the iodine containing materials based on additional use and toxicity information.

Anesthetics

DFG reports that the anesthetics, Tricaine methanesulfonate, commonly known as MS-222 (with trade names of Finquel® or Tricaine-S®), carbon dioxide gas, and sodium bicarbonate may be used at the San Joaquin Fish Hatchery. MS-222 has been approved by FDA for use as an anesthetic for Salmonidae. It is intended for the temporary immobilization of fish, amphibians and other aquatic, cold-blooded animals. Carbon dioxide gas is used to anesthetize fish prior to spawning. FDA considers carbon dioxide gas an LRP drug for use in aquaculture. These materials are used within very small volumes of water and may dissipate very rapidly. For these reasons and due to limited information regarding toxicity and persistence, this Order does not establish WQBELs for the anesthetics. The Order does require that all aquaculture drugs and chemicals not discharged to receiving waters be disposed of in an environmentally safe manner, according to label guidelines, Material Safety Data Sheet guidelines and BMPs. Any other form of disposal requires approval from the Executive Officer. Further, use information and monitoring data must be reported as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information, and other information as it becomes available, and this Order may be reopened to establish effluent limitations for the anesthetics, if necessary.

Hydrogen Peroxide

The DFG reports that a 35 percent solution of hydrogen peroxide (H_20_2) at dose rates of up to 100 ppm for the control of external parasites may be used at DFG facilities. Hydrogen peroxide is typically used as a short-term immersion bath treatment in holding tanks, or as a raceway flush treatment. FDA considers hydrogen peroxide to be an LRP drug when used to control fungi on fish at all life stages, including eggs. Hydrogen peroxide may also be used under an INAD exemption to control bacterial gill disease in various fish, fungal infections, external bacterial infections, and external parasites. When used as a one-hour treatment at 100 ppm in only one raceway at a time, a discharge concentration of 4.4 ppm is possible (based on 35 percent active material and dilution by a factor of eight); however, hydrogen peroxide will react rapidly with organic matter in the flow through the hatchery and any residual concentration in the discharge will likely be lower. Hydrogen peroxide is a strong oxidizer that breaks down into water and oxygen; however, it exhibits toxicity to aquatic life during the oxidation process. Results of a single acute toxicity test conducted by the DFG Pesticide Unit using *C. dubia* showed a 96-hour NOAEL of 1.3 mg/L. Since there is limited toxicity information available at this time and no information regarding actual discharge concentrations of hydrogen peroxide, this Order does not include WQBELs for hydrogen peroxide. The Order does require reporting of use and monitoring information, as specified in the attached Monitoring and Reporting Program. Results of additional toxicity testing must also be submitted as specified in Provision No. 6 of the Order. The Regional Board will review this information, and other information as it becomes available, and this Order may be reopened to establish effluent limitations for hydrogen peroxide based on additional use and toxicity information.

Potassium Permanganate

Potassium permanganate (also known by the trade name of Cairox^{TM}) may be used to control gill disease as a 1-hour flush treatment in a single raceway at up to 5 mg/L resulting in an estimated discharge of 0.6 mg/L potassium permanganate. These calculations assume the flow from the raceway receiving treatment mixes completely with the entire flow through the facility and is discharged with no further concentration, breakdown, or dilution of potassium permanganate. Potassium permanganate has a low estimated lifetime in the environment, being readily converted by oxidizable materials to insoluble manganese dioxide (MNO_2). In non-reducing and non-acidic environments, MNO_2 is insoluble and has a very low bioaccumulative potential. Potassium permanganate is not approved for use in aquaculture under FDA's NADA program and should therefore be used in accordance with an INAD exemption granted by FDA. Potassium permanganate is typically applied in a single, short-term treatment, or as a series of closely-spaced, short-term treatments. Results of a single acute toxicity test conducted by the DFG Pesticide Unit using *C. dubia* showed a 96-hour NOAEL of 0.25 mg/L for potassium permanganate. Since there is limited toxicity information available at this time and no information regarding actual discharge concentrations of potassium permanganate, this Order does not include WQBELs for potassium permanganate. The Order, however, requires reporting of use and monitoring information, as specified in the attached Monitoring and Reporting Program. Results of additional toxicity tests must also be submitted as specified in Provision No. 6. The Regional Board will review this information, and other information as it becomes available, and this Order may be reopened to establish effluent limitations for potassium permanganate based on additional use and toxicity information.

Chloramine-T

The DFG reports that Chloramine-T may be used by the Discharger. Chloramine-T is available for use in accordance with an INAD exemption by FDA. DFG reports that Chloramine-T may be used at a rate of 10 ppm for one-hour flush treatment in a single raceway, which would result in an estimated maximum concentration in the discharge of 1.3 mg/L. These calculations assume that flow from the raceway receiving treatment mixes completely with the entire flow through the facility and is discharged with no further concentration, breakdown, or dilution of Chloramine-T. Chloramine-T breaks down into para-toluenesulfonamide (p-TSA) and, unlike other chlorine based disinfectants, does not form harmful chlorinated compounds. The Discharger has not conducted biotoxicity tests using Chloramine-T, however results of toxicity testing from other sources show a 96-hour LC_{50} for rainbow trout of 2.8 mg/L. The 48-hour NOEC for *Daphnia magna* was reported as 1.8 mg/L (Halamid. n.d. *Halamid, Aquaculture*. http://www.halamid.com/aqua.htm). The DFG Pesticide Unit is proposing to conduct additional toxicity testing on Chloramine-T to determine NOAEL concentrations. Since there is limited toxicity information available and no information regarding actual discharge concentrations of Chloramine-T, this Order does not include WQBELs for Chloramine-T. The Order, however, requires reporting of use and monitoring information for all aquaculture drugs and chemicals, including Chloramine-T, as specified in the attached Monitoring and Reporting Program. Results of additional toxicity tests must also be submitted as specified in Provision No. 6. The Regional Board will review this information, and other

information as it becomes available, and this Order may be reopened to establish effluent limitations based on additional use and toxicity information.

Antibiotics – Oxytetracycline, Penicillin G, Florfenicol. Amoxicillin trihydrate, Erythromycin, and Romet

In the future, the facility may periodically use the antibiotics oxytetracycline and penicillin G as therapeutic agents in bath treatments to control fish diseases. The Regional Board does not have estimates of the concentrations of oxytetracycline and penicillin G that could be present in effluent from the Facility.

Oxytetracycline, also known by the brand name Terramycin®, is an antibiotic approved through FDA's NADA program for use in controlling ulcer disease, furunculosis, bacterial hemorrhagic septicemia, and pseudomonas disease in salmonids. Oxytetracycline is most commonly used at CAAP facilities as a feed additive. However, oxytetracycline may also be used as an extra-label use under a veterinarian's prescription in an immersion bath of approximately six to eight hours in duration. Because oxytetracycline may be applied in an immersion bath for up to eight hours at a time, the Regional Board considered the results of acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limitations for oxytetracycline used in an immersion bath treatment were necessary in this Order. Results of acute toxicity tests using *C. dubia* showed a 96-hour NOAEL of 40.4 mg/L. Results of chronic toxicity tests using *C. dubia* showed a 7-day NOEC for reproduction of 48 mg/L. For DFG facilities in the Region where the Regional Board has available estimated discharge concentrations of oxytetracycline, the estimated discharge of oxytetracycline is well below the lowest NOEC and NOAEL. Therefore, at this time, oxytetracycline, when used in an immersion bath treatment, is not discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of a narrative water quality objective for toxicity from the Basin Plans. Accordingly, this Order does not include an effluent limitation for oxytetracycline. However, monthly use of oxytetracycline must be reported as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information, and other information as it becomes available, and this Order may be reopened to establish effluent limitations based on additional use and toxicity information.

Penicillin G, also known as Pen-G, is an antibiotic used in a six to eight hour immersion bath treatment to control acute disease outbreaks. Penicillin G is not approved under FDA's NADA program and its' extra-label use in aquaculture requires a veterinarian's prescription. Due to the length of treatment time (up to eight hours), the Regional Board considered the results of acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limitations for penicillin G were necessary in this Order. Results of acute toxicity tests using *C. dubia* showed a 96-hour NOAEL of 890 mg/L. Results of 7-day chronic toxicity testing using *Pimephales promelas* showed 7-day NOEC for survival of 350 mg/L. For DFG facilities in the Region where the Regional Board has available estimated discharge concentrations of penicillin G, the estimated discharge of penicillin G is well below the lowest NOEC and NOAEL. Therefore, at this time, penicillin G, when used in an immersion bath

treatment, is not discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of a narrative water quality objective for toxicity from the Basin Plans. Accordingly, this Order does not include an effluent limitation for penicillin G. However, monthly use of penicillin G must be reported as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information, and other information as it becomes available, and this Order may be reopened to establish effluent limitations based on additional use and toxicity information.

Oxytetracycline and Florfenicol are antibiotics that may potentially be used by the Discharger in feed formulations to control acute disease outbreaks. They must be used under an INAD exemption or a veterinarian's prescription for extra-label use. In the NPDES General Permit for Aquaculture Facilities in Idaho (Idaho General Permit), USEPA Region 10 distinguishes between antibiotics applied in feed formulations and antibiotics applied in immersion baths. The Idaho General Permit concludes that drugs or chemicals administered via feed, and ingested by fish, pose little threat to aquatic life or beneficial uses because a majority of the drug is utilized by the fish, though some literature suggests otherwise. As stated in the Idaho General Permit, "USEPA believes that disease control drugs and other chemicals provided for ingestion by fish do not pose a risk of harm or degradation to aquatic life or other beneficial uses." The Regional Board finds that Oxytetracycline and Florfenicol (when used as feed additives) are used in a manner that reduces the likelihood of direct discharge of antibiotics to waters of the United States or waters of the State, particularly when Dischargers implement BMPs as required by this Order. Therefore, Oxytetracycline and Florfenicol are not discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of a narrative water quality objective for toxicity from the Basin Plan. Accordingly, this Order does not include water quality-based effluent limitations for these substances, but does require monthly reporting as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information and this Order may be reopened to establish effluent limitations based on additional use and toxicity information.

Salt

DFG reports that sodium chloride (salt) may be used at the San Joaquin Fish Hatchery as a flush treatment at an application rate of up to 700 pounds per cfs. If salt is applied to only one of eight production ponds/raceways and allowed to dissipate in the discharge before it is applied to a second production pond/raceway (i.e. salt concentration is diluted by a factor of eight within the hatchery), this application rate corresponds to the following salt concentrations in the discharge, when the discharge of salt occurs over a period of one to four hours. Estimates of specific conductivity contributed to the discharge are also presented, based on the rule-of-thumb that conductivity (μmhos/cm) will be approximately 60 percent of the TDS concentration (mg/L).

Duration of Discharge	Possible Salt (NaCl) Concentration in the Discharge	Possible Specific Conductivity in the Discharge Attributable to Salt
1 hour	390 mg/L	230 µmhos/cm
2 hours	195 mg/L	120 µmhos/cm
3 hours	130 mg/L	80 µmhos/cm
4 hours	100 mg/L	60 µmhos/cm

The Basin Plan, at Table III-3, includes a not-to-exceed water quality objective for salinity in the San Joaquin River below Friant Dam to Mendota Pool expressed as 150 µmhos/cm specific conductivity. Due to limited, specific application information for the San Joaquin Fish Hatchery, however, the Regional Board has not found that, due to salt application, there is a reasonable potential for excursions from the applicable water quality objective for salinity. This Order requires reporting of use information and monitoring data for aquaculture drugs and chemicals, including salt, through the attached Monitoring and Reporting Program. The Regional Board will review this information, and other information as it becomes available, and this Order may be reopened to establish effluent limitations for salt, if necessary.

pH

There are no technology-based effluent limitations for pH that are applicable to discharges from fish hatcheries. The Basin Plan, however, establishes a water quality objective for pH of 6.5 to 8.5, and in fresh waters designated as warm or cold freshwater habitat, discharges cannot cause pH changes of greater than 0.5 pH units. The pH limitation of Order No. 97-001 is therefore being retained.

BASIS FOR DISCHARGE PROHIBITIONS

Most discharge prohibitions are retrained from the previous permit. A prohibition regarding fish spawning wastes is proposed so that the hatchery will not return dead fish and similar material to the San Joaquin River.

BASIS FOR SOLID WASTE DISPOSAL PROVISIONS

Solid waste disposal provisions in this Permit are based on the requirements of CCR Title 27 and prevention of unauthorized discharge of solid wastes into waters of the United States or waters of the State.

BASIS FOR BEST MANAGEMENT PRACTICES PROVISIONS

Best Management Practices plan requirements are established based on requirements in Effluent Limitations Guidelines and New Source Performance Standards for the Concentrated Aquatic Animal Production Point Source Category at 40 CFR Part 451.

BASIS FOR RECEIVING WATER LIMITATIONS

Receiving water limitations are interpretations of water quality objectives from the Basin Plan. Receiving water limitations in this Order are included to ensure protection of beneficial uses of receiving waters. A receiving water condition not in conformance with a limitation is not necessarily a violation of the Permit. In those circumstances, the Regional Board may require an investigation to determine cause prior to asserting that a violation has occurred.

MONITORING AND REPORTING PROGRAM

Receiving water monitoring requirements are based on the Basin Plan and are authorized by California Water Code Sections 13267 and 13383. Receiving water monitoring requirements are standard requirements in NPDES permits issued by the Regional Board.

Because treatment and disposal of domestic wastewater is now accomplished using an onsite septic system and leach field, the proposed Monitoring and Reporting Program no longer includes monitoring requirements for the domestic disposal ponds and ground water.

Tt:JME