

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ORDER NO. R5-2004-0112

NPDES NO. CA0004561

WASTE DISCHARGE REQUIREMENTS  
FOR  
STATE OF CALIFORNIA  
DEPARTMENT OF FISH AND GAME  
DARRAH SPRINGS FISH HATCHERY  
SHASTA 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), (hereafter Discharger) submitted a Report of Waste Discharge, dated 21 December 2000, and applied for a permit renewal to discharge wastewater under the National Pollution Discharge Elimination System (NPDES) for Darrah Springs Fish Hatchery (Facility).
2. The discharge is presently governed by Order No. 96-037 (NPDES No. CA0004561), adopted by the Regional Board on 23 February 1996.
3. The fish hatchery is on Assessor's Parcel No. 704-240-03, west of Manton in Section 29, T30N, R1W, MDB&M, as shown on Attachment A, a part of this Order. The facility lies within the Battle Creek Hydrologic Subarea No. 507.12. The hatchery facilities are spread out over the 80 acre property and consist of 20 residences for hatchery staff, a large hatchery building, two separate raceway series (an Upper Raceway Series and a Lower Raceway Series), a large spring-fed Brood Pond, a main office, a vehicle maintenance building, a former freezer building (used only for storage at this time) and multiple bulk feed storage bins. Source water for the Facility comes from Darrah Springs and the Pacific Power Ditch and wastewater is discharged directly to Darrah Creek and the Pacific Power Ditch, both of which are tributary to the Coleman Canal, a tributary to Battle Creek, a water of the United States and the State.
4. The U.S. Environmental Protection Agency (USEPA) and the Regional Board have classified this discharge as a minor discharge.
5. Based on recent Annual Reports (2000-2003), the Facility has an average annual production of 414,029 pounds of rainbow trout. Average annual feed usage for this period was 564,670 pounds. No egg harvesting takes place at the facility and all eggs are imported from other DFG hatcheries. An average of 1.5 million trout eggs are incubated and reared in the hatchery building annually. The Discharger currently discharges an average of 18.7 mgd (29 cfs) of flow-through hatchery wastewater from the entire facility at three separate discharge locations, Discharge 002, 003 and 004, as shown on Attachment B, a part of this Order. Discharge 001 directly to Darrah Creek from the Hatchery Building is no longer used. The facility has a design maximum flow rate of 26.7 mgd (41.4 cfs).

Hatchery Building: The hatchery building is fed by surface water diversion from Darrah Creek, as shown on Attachment B. The hatchery building contains 58 single hatchery troughs and 30 deep tanks. Currently, all the flow-through wastewater from the hatchery building is discharged back into the Lower Raceway Series.

Brood Ponds: Several unnamed springs supply water to the Brood Ponds. The Brood Ponds consist of three concrete-lined ponds, approximately 450 feet in length. According to a 1994 study conducted by DFG's hatchery consultant, approximately 4.8 mgd (7.5 cfs) of flow-through hatchery wastewater is discharged into Darrah Creek from the Brood Ponds at Discharge 002. However, at times, approximately 80 percent of the waste water from the Brood Ponds is pumped to the Lower Raceways Series where it is aerated and re-circulated through the Lower Raceway Series.

Lower Raceway Series: There are six large raceways associated the Lower Raceway Series. The Lower Raceway Series is supplied by several water sources, including a surface water diversion from Darrah Creek, flow-through wastewater from the hatchery building, and water re-circulated water from the Brood Ponds (as shown on Attachment B). An average of 11.6 mgd (18 cfs) flow-through wastewater from the Lower Raceway Series is discharged directly back into Darrah Creek, (Discharge 003). Darrah Creek flows into Ward's Pond, located a quarter mile downstream of the Lower Raceway Series. Flow from Ward's Pond is diverted into the Coleman Canal via the Asbury Pumping Station and Asbury Siphon. Overflow from Ward's Pond enters Baldwin Creek, a tributary of Battle Creek. The Lower Raceway Series does not have a settling basin, therefore, all flow-through wastewater is discharged directly back into Darrah Creek.

Upper Raceway Series: As shown on Attachment B, the Upper Raceway Series is supplied by a surface water diversion from the Pacific Power Ditch. An average of 7.1 mgd (11 cfs) of flow-through wastewater is discharged back into the Pacific Power Ditch from the Upper Raceway Series (Discharge 004). There are four separate raceways associated with the Upper Raceway Series, each with their own headworks. At certain times of the year, water from the each raceway is circulated through an aeration tower at the raceway mid-point. There is no settling basin associated with the Upper Raceway Series, and all flow-through wastewater is discharged directly to the Pacific Power Ditch.

6. Approximately 20 people, consisting of employees and their family members, live at the Facility. Potable water is supplied from a domestic well. Domestic wastewater from the facility is discharged to three separate septic tank/leachfield systems as shown on Attachment B. The easterly residences discharge into a septic tank/leachfield system (Leachfield #1). The residences near the Upper Raceway Series discharge into a community septic tank/leachfield system adjacent to the residences (Leachfield #2). Domestic sewage from the office building and hatchery building discharges into a third septic tank/leachfield system which can discharge to a sewage lagoon when necessary during the rainy season (Leachfield #3). The sewage lagoon, approximately 80 X 40 feet and 15 feet deep was constructed to accommodate excess sewage from the northern leachfield (primarily during

- the rainy season). A barbwire fence with a gate encircles the lagoon. A groundwater monitoring well was installed in 1997 adjacent to the lagoon. Groundwater monitoring for total and fecal coliform is required on a quarterly basis when depth to ground water is less than 5 feet measured from the bottom of the sewage lagoon. A review of the self-monitoring reports shows that the Discharger continues to monitor the sewage lagoon on a quarterly basis and no exceedances of coliform have been detected. Results for total and fecal coliform are <2 MPN/100 mL.
7. The facility has one 1,000-gallon Convault tank for gasoline. Limited vehicle maintenance is performed on-site in the Facility's garage. There is "new" oil stored in the garage adjacent to the shop. Used oil, oil filters and extra oil are hauled on a routine basis by a licensed hazardous waste hauler.
  8. Wastes generated at the Facility include fish fecal material, unconsumed fish food, nutrients, algae, silt, chemicals and therapeutic agents used to treat fish and control disease.
  9. Aquaculture drugs and chemicals are used at the Facility 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. There is a specific parasite at the Facility, known as "gill fluke", that a majority of the chemicals are used to treat. Chemicals currently used at the Facility include copper sulfate, acetic acid, hydrogen peroxide, potassium permanganate, PVP Iodine, and salt. To treat enteric redmouth disease, the Discharger administers enteric redmouth bacterin. All chemicals used at the fish hatchery are stored in a locked area within the former ice storage building.
  10. Chemicals that are not currently used at the Facility, but may possibly be used in the future include formalin (as a 37% formaldehyde, methanol-free solution) and Chloramine-T. Antibiotics such as Oxytetracycline (Terramycin<sup>®</sup>), Amoxicillin trihydrate, Romet-30<sup>®</sup> (Sulfadimethoxine-ormetoprim), erythromycin, and Florfenicol may be used during periods of disease outbreak. Penicillin G, an antibiotic, may be used as an immersive bath treatment during periods of disease outbreak at the Facility. Tricane methanesulfonate (MS-222), carbon dioxide and Aqui-S<sup>®</sup> may be used to anesthetize fish. Vaccines, such as Vibrio vaccine may also be used.

#### **APPLICABLE REGULATIONS, POLICIES, AND PLANS**

11. 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.

12. The operation of CAAP facilities may introduce a variety of pollutants into receiving waters. The 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 coliform, 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.
13. 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.
14. 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, 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.

15. 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 (CWC) Section 13263(a), waste discharge requirements must implement the Basin Plans.
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.
17. 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 No. 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 Regional Board has considered Resolution No. 68-16 and Federal antidegradation regulations at 40 CFR 131.12 and compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.

#### **RECEIVING WATER BENEFICIAL USES**

18. The Basin Plan at page II-2.00 states: "Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams." Furthermore, the Regional Board generally is required to apply the beneficial uses of municipal and domestic supply (MUN) to surface waters based on SWRCB Resolution No. 88-63, which was incorporated in the Basin Plan pursuant to Regional Board Resolution 89-056. The Basin Plan does not specifically identify beneficial uses for the Coleman Canal, but does identify present and potential uses for Battle Creek, to which Coleman Canal is a tributary.

The beneficial uses of Battle Creek are agricultural irrigation and stock watering (AGR), hydroelectric power generation (POW), water contact recreation and canoeing and rafting (REC-1), non-contact water recreation (REC-2), warm freshwater aquatic habitat (WARM) and warm spawning habitat (SPWN – WARM), cold freshwater aquatic habitat (COLD), cold fish migration habitat (MIGR – COLD), and cold spawning habitat (SPWN – COLD), and wildlife habitat (WILD). The Basin Plan on page II-1.00 states: “Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning...” and with respect to disposal of wastewaters states that “...disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses.” In reviewing whether certain existing and/or potential uses of Battle Creek apply to Coleman Canal, the Regional Board has considered that the quality of water in Coleman Canal affects the water quality downstream in Battle Creek. Water rights have been assigned downstream in Battle Creek for both agriculture and additional aquaculture uses. Coleman Canal downstream is used for aquaculture. In addition, portions of the flow from the discharge may be diverted for irrigation during the irrigation season. Thus, the Regional Board finds that the beneficial uses identified in the Basin Plan for Battle Creek and, based on State Board Resolution No. 88-63, the beneficial use of municipal and domestic supply (MUN), are applicable to Coleman Canal.

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

#### **EFFLUENT LIMITATIONS AND OTHER SPECIFICATIONS**

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

#### **TECHNOLOGY-BASED EFFLUENT LIMITATIONS**

21. The Facility creates wastes, including solids from algae, silt, fish feces, and uneaten feed. 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. The Regional Board is establishing effluent limitations for discharges of total suspended solids (TSS) and settleable solids from this Facility. 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 No. 96-037. 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. Order No. 96-037 established effluent limitations for TSS of 5.0 mg/L net TSS as an average monthly limitation and 15 mg/L net TSS as a maximum daily limitation. In addition, Order No. 96-037 established effluent limitations for settleable solids of

0.1 mL/L as an average monthly limitation and 0.2 mL/L as a maximum daily limitation. 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 food. 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).

### **WATER QUALITY-BASED EFFLUENT LIMITATIONS**

22. 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)].
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, 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).
24. On 11 December 2000, the Discharger was issued a letter under the authority of California Water Code Section 13267 requesting effluent and receiving water monitoring to perform a reasonable potential analysis. The Discharger collected effluent and receiving water samples on 11 February 2003 to determine if the priority pollutants established in the CTR and NTR were detected. Analytical results were submitted for volatile substances, semi-volatile substances, metals, asbestos, 2,3,7,8-TCDD dioxin, and sixteen other dioxin congeners. None of the priority pollutants were detected at concentrations that would cause or contribute to an in-stream excursion above a water quality objective. The effluent sample for priority pollutant metals was collected at a time when the Discharger was not using copper sulfate for disease control. Based on additional analyses conducted during the use of copper sulfate the Regional Board finds that the discharge does have a reasonable potential

to cause or contribute to an in-stream excursion above the CTR objective (acute and chronic) criteria for copper in the receiving water during the copper treatments. Effluent limitations for copper are included in this Order.

25. Based 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 finds that the discharge has a reasonable potential to cause or contribute to an in-stream excursion above numeric or narrative water quality objectives for copper, pH, and formaldehyde. Effluent limitations for these constituents are included in this Order. The Regional Board is not obligated to delegate the assimilative capacity of receiving waters to a Discharger. Therefore, the Regional Board establishes water quality-based effluent limitations without benefit of dilution in this Order. Water quality-based effluent limitations are based on the application of water quality criteria or objectives at the point of discharge.

#### ***CTR EFFLUENT LIMITATIONS***

26. Copper, primarily in the form of copper sulfate, is used in fish hatcheries to control algae and is also used as a flush treatment to control external parasites and bacteria on fish. The Discharger reports using up to 270grams of copper sulfate crystals per raceway, with one raceway treated at a time. Annual copper sulfate use ranged from 144 lbs in year 2000 to 291.3 lbs in 2003. Copper sulfate crystals are pre-mixed with water and acetic acid (to dissolve the copper), and the solution is added to the raceway headworks. The Discharger estimates there is an estimated 1-hour flush of copper sulfate through a raceway. At the minimum flow through the Facility, and with the maximum use of copper sulfate per raceway treatment, the maximum calculated concentration of copper in a 1-hour flush is 150 ug/L in the Upper Raceway Series and 240 ug/L in the Lower Raceway Series. Maximum usage in the hatchery building would be 360 grams when treating 15 tanks, and 20 troughs (or about half the units at one time). This amount of copper sulfate used in the hatchery building would provide a 2.5-hour discharge of 80 ug/L total copper. The Discharger conducted monitoring in 2002 and 2003, taking grab samples during copper treatments. Actual copper concentrations measured during 21 treatments varied with the flow and were dependent on when the sample was taken during the treatment. The maximum reported concentration was 160 ug/L during the copper treatments of one raceway at a time.
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. Since a site-specific conversion factor has not been developed for copper as described in the SIP Section 1.4.1, the USEPA conversion factor for copper of 0.960 is used for translating the dissolved copper criterion into a total recoverable effluent concentration with no dilution. However, the CTR acute



aquatic life criterion for copper is not applicable to the Sacramento River or its tributaries above Hamilton City. Battle Creek is tributary to the Sacramento River above Hamilton City. Therefore, the applicable copper criterion for protection of aquatic life from acute effects is a site-specific criterion specified in the Basin Plan. The applicable chronic criterion for copper is from the CTR. Both of these criteria are dependent on the hardness of the receiving water. At a hardness of 25 mg/L, the applicable acute and chronic copper criteria are 3.8 ug/L and 1.9 ug/L respectively. At hardness of 50 mg/L, these criteria increase to 7.2 ug/L (acute) and 3.6 ug/L chronic and at a hardness of 100 mg/L they are 13.4 ug/L (acute) and 6.7 ug/L (chronic). Receiving water hardness has ranged from 69 to 94 mg/L during monitoring of copper treatments in 2003. Based on the calculated concentration as well as the actual measurements during treatments, the copper concentration in the effluent has the reasonable potential to exceed the water quality objective. Therefore, this Order includes both maximum daily and average monthly effluent limitations for copper. The Basin Plan criterion is the most limiting criterion; therefore, the effluent limitations are based on the Basin Plan criterion. These effluent limitations are adjusted for hardness as shown in Attachment C.

28. As the effluent limitation for copper is a new requirement in this Order, the Discharger requested a compliance time schedule be granted to allow time to develop alternative treatments. 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.”* The Discharger indicated that until a substitute treatment is developed there would be a significant loss of fish as a result of parasite and bacterial infestations without the use of copper treatments. The Discharger has quantified the use of copper and minimum concentrations necessary to control the parasite and bacterial infestations and is actively pursuing the development of alternate treatments. The Discharger has also implemented changes in the treatment practices to minimize the concentration of copper in the discharge, such as treating only one raceway at a time. The effluent limitation for copper, however, is based on the Basin Plan criterion and is fully applicable upon adoption of this Order, therefore, compliance schedules for meeting the limitation cannot be included in this NPDES Permit. However, the Regional Board may adopt other Orders, such as a Cease and Desist Order, allowing the Discharger a period of time to fully comply with the effluent limit for copper.

### ***NON-CTR EFFLUENT LIMITATIONS***

29. The Basin Plan contains water quality objectives for pH in the form of a range of acceptable pH values (measured in standard units). The Regional Board determined that the discharge from this Facility may cause, have the reasonable potential to cause, or contribute to an in-stream excursion of the numeric water quality objective for pH from the Basin Plan. Accordingly, the Regional Board established effluent limitations in the form of acceptable ranges of pH between 6.5 to 8.5 for discharges to Darrah Creek and Pacific Power Ditch.

30. Numeric water quality criteria, or Basin Plan numeric objectives are currently not available for most of the aquaculture drugs and chemicals used by the Discharger or proposed for use at this facility. Therefore, the Regional Board used the narrative water quality objective for toxicity from the Basin Plans 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 *Technical Support Document for Water Quality-based Toxics Control* (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 Pesticide Investigation Unit (DFG Pesticide Unit) has initiated biotoxicity studies to determine the aquatic toxicity of certain aquaculture drugs and chemicals commonly used at their CAAP facilities in the Region.
31. Sodium chloride (salt) is used in conjunction with other flush treatments (such as copper sulfate) to control fish diseases at the hatchery. Annual usage of sodium chloride ranged from a minimum of 59,650 lbs in 2000 to a maximum of 113,500 lbs in 2003. Maximum treatment is 200 lbs per raceway, which allows a one-hour discharge of 80.8 mg/L sodium chloride in the Upper Raceway Series, and 49.5 mg/L sodium chloride in the Lower Raceway Series, respectively. Salt usage in the hatchery building is below the maximum usage for the raceways, and is discharged to the Lower Series. FDA considers sodium chloride an unapproved new animal drug of low regulatory priority (LRP drug) for use in aquaculture. Consequently, FDA is unlikely to take regulatory action if an appropriate grade is used, good management practices are followed, and local environmental requirements are met. The Regional Board has determined that the discharge of chloride from the Facility from sodium chloride application rates as described by the Discharger will not cause, have the reasonable potential to cause, or contribute to an in-stream excursion of applicable water quality criteria or objectives. Monitoring of conductivity and chloride is required and monthly use of sodium chloride must be reported as specified in the Monitoring and Reporting Program.
32. Formalin (as a 37% formaldehyde solution) is rarely used at the hatchery with the last use reported in February 1998. The Discharger reports that formalin may be used in the future

as a replacement treatment for copper. The raceway use would be a six hour drip at 25 mg/L. Maximum usage would be 11 and 12 gal for the Upper and Lower Raceway Series, respectively. The seven hour discharge from the Upper Raceway Series would contain 5.3 mg/L formalin, or 1.9 mg/L formaldehyde. The Lower Raceway Series discharge would contain 3.5 mg/L formalin, or 1.2 mg/L formaldehyde. Because the Facility is a flow-through facility without on-line settling, formaldehyde is expected to be present in the discharge for approximately the same duration as treatment, typically 8-hours or less. Use in the hatchery building would be well below the amount used in raceway treatments (not more than a ½ gallon per trough). 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 *Saprolegniaceae* 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. Formalin is used as a "drip" treatment to control fungus on fish eggs, or as a "flush" treatment in raceways of 1-8 hours in duration. Formalin may be applied in multiple treatments over the course of a given month, or may be applied in raceways for up to 8 hours at a time.

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). The DFG Pesticide Unit conducted biotoxicity studies to determine the aquatic toxicity of formaldehyde using *Pimephales promelas*, and *Ceriodaphnia dubia* (*C. dubia*) in accordance with the analytical methods specified in EPA600/4-91-002, *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 *C. dubia* in accordance with methods specified in EPA600/4-90/027, *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<sub>50</sub>. The Regional Board considered the results of both acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limits for formalin as formaldehyde were necessary.

Results of chronic toxicity tests indicated *C. dubia* was the most sensitive species, with a 7-day NOEC value of 1.3 mg/L formaldehyde for survival and less than 1.3 mg/L for reproduction. Acute toxicity tests conducted using *C. dubia* showed a 96-hour NOAEL of 1.3 mg/L formaldehyde. Additional acute toxicity tests were conducted using an 8-hour exposure resulting in a 96-hour NOAEL concentration of 6.7 mg/L formaldehyde. Based on the proposed application rates for formalin proposed by the Discharger, the Regional Board determined that if Formalin is used at this Facility, formaldehyde may be 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 includes water quality-based effluent limitations for formaldehyde. Because the Facility is a flow-through facility without on-line settling, formaldehyde is expected to be present in the discharge for approximately the same duration as treatment, typically 8-hours or less. Therefore, the Regional Board is establishing a maximum daily effluent limitation of 6.7 mg/L with the requirement that the Facility monitor for formaldehyde during formalin treatment. This limit is based on the observed 96-hour NOAEL with 8-hour exposure to formaldehyde. In addition, the Regional Board is establishing an average monthly effluent limitation of 0.65 mg/L formaldehyde based on the 96-hour NOAEL with 96-hours of exposure calculated using procedures from USEPA's TSD. This limit will ensure protection of aquatic life from longer-term exposure to formaldehyde through successive treatments with formalin. The previous Order included a less stringent daily maximum limitation for formaldehyde of 5 mg/L based on a USEPA Health Advisory for acute 10-day exposure. Based on the above new information for short term toxicity for an 8-hour exposure, which was not available at the time of issuance of the previous Order, and inclusion of the average monthly effluent limitation of 0.65 mg/L, establishment of a less stringent daily maximum effluent limitation is appropriate. The formaldehyde limitations established in this permit are consistent with federal and State antidegradation and antibacksliding requirements.

33. Acetic acid is used in conjunction with copper flushes to help put the copper sulfate into solution. Annual usage of acetic acid over the past four years has ranged from a minimum of 45.2 gallons in 2001 to a maximum of 106.25 gallons in 2003. The maximum usage per raceway is 120 mL, and would have a discharge concentration of 0.1 mg/L in the Upper Raceway Series and 0.06 mg/L in the Lower Raceway Series. Acetic acid may also potentially be used by the Discharger as a "flush" treatment in raceways for the control of external parasites on fish. The Basin Plan contains water quality objectives for pH in the form of a range of acceptable pH values (measured in standard units). Since acetic acid will lower the pH of the water the Regional Board has included an effluent limit for pH. Monthly use of acetic acid must be reported as specified in the attached Monitoring and Reporting Program.
34. Hydrogen peroxide (35 % H<sub>2</sub>O<sub>2</sub>) is used for the control of external parasites at the hatchery. The Discharger reports a one-hour drip treatment using 15 gallons in the Upper Raceway Series and 16 gallons in the Lower Raceway Series. The two-hour discharge from the Upper Raceway Series would have a calculated concentration of 8.9 mg/L and the Lower Raceway Series 5.8 mg/L. Use in the hatchery building is limited and well below the level used in the raceways. 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. Hydrogen peroxide is a strong oxidizer that breaks down into water and oxygen; however, it exhibits toxicity to aquatic life during the oxidation process. The Regional Board considered the results of acute aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limits for hydrogen peroxide were necessary in this Permit. Results of a single acute toxicity test using *C. dubia* showed a 96-hour NOAEL of 1.3 mg/L. There is no

toxicity information available for shorter exposure periods. The DFG Pesticide Unit is proposing to conduct additional toxicity testing on hydrogen peroxide to determine NOAEL concentrations for shorter exposure periods. Since there is limited short- and long-term toxicity information available at this time and no information regarding actual discharge concentrations of hydrogen peroxide, this permit does not include water quality-based effluent limitations for hydrogen peroxide. However, use and monitoring of hydrogen peroxide 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. 5. The Regional Board will review this information, and other information as it becomes available and this permit may be reopened to establish effluent limits based on additional use and toxicity information.

35. Potassium permanganate is used a flush treatment to control external parasites and bacteria. Annual usage of potassium permanganate over the past four years has ranged from a minimum of 4.25 lbs in 2001 to a maximum of 9.2 lbs in 2003. Maximum usage is 120 grams in the Upper and Lower Raceway Series. The calculated concentration in the discharge is 0.11 mg/L in the Upper Raceway Series, and 0.06 mg/L in the Lower Raceway Series. Potassium permanganate may occasionally be used in the brood ponds as well. Potassium permanganate has a low estimated lifetime in the environment, being readily converted by oxidizable materials to insoluble manganese dioxide (MNO<sub>2</sub>). In non-reducing and non-acidic environments, MNO<sub>2</sub> is insoluble and has a very low bioaccumulative potential.

Because potassium permanganate is typically applied in a single, short-term treatment, or as a series of closely-spaced, short-term treatments, the Regional Board considered the results of acute aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limits for potassium permanganate were necessary in this Permit. Results of a single acute toxicity test using *C. dubia* showed a 96-hour NOAEL of 0.25 mg/L for potassium permanganate. There is no toxicity information available for shorter exposure periods. The DFG Pesticide Unit is proposing to conduct additional toxicity testing on potassium permanganate to determine NOAEL concentrations for shorter exposure periods. Since there is limited toxicity information available for short- and long-term exposure and no information regarding actual discharge concentrations of potassium permanganate, this permit does not include water quality-based effluent limitations for potassium permanganate. However, use and monitoring of potassium permanganate 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. 5. The Regional Board will review this information, and other information as it becomes available and this permit may be reopened to establish effluent limits 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. The Discharger reports that the therapeutic treatment consists of a 10-20 mg/L dose for a 3-hour exposure. 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 were submitted and showed a 96-hour LC<sub>50</sub> for rainbow trout of 2.8 mg/L. The 48-hour NOEC for *Daphnia magna* was reported as 1.8 mg/L. There is no toxicity information available for shorter exposure periods. The DFG Pesticide Unit is proposing to conduct additional toxicity testing on Chloramine-T to determine NOAEL concentrations for shorter exposure periods. Since there is limited toxicity information available for short- and long-term exposure and no information regarding actual discharge concentrations of Chloramine-T, this permit 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. 5. The Regional Board will review this information, and other information as it becomes available and this permit may be reopened to establish effluent limits based on additional use and toxicity information.
37. PVP Iodine, a solution composed of 10% PVP Iodine Complex and 90% inert ingredients, is used at the Facility as a fish egg disinfectant (fungicide). The Discharger mixes 4 oz. of PVP Iodine in 10 gallons of water and the eggs are dipped into PVP Iodine for 10 minutes. FDA considers PVP iodine an LRP drug for use in aquaculture. The Discharger is not proposing to discharge PVP Iodine to waters of the United States or waters of the State, but plans to use other means of disposal. Consequently, this Order does not include water quality-based effluent limitations for PVP Iodine, but use and means of disposal of this chemical must be reported as specified in the attached Monitoring and Reporting Program. Also, this Order includes a provision requiring 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. Furthermore, if the Discharger wishes to discharge this chemical, results of toxicity tests for PVP Iodine must be submitted as specified in Provision No. 5. 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 these constituents. Monitoring of PVP Iodine is required and monthly use of PVP Iodine must be reported as specified in the Monitoring and Reporting Program.
38. The Discharger uses the anesthetic tricaine methanesulfonate, commonly known as MS-222 (with trade names of Finquel<sup>®</sup> or Tricaine-S<sup>®</sup>). MS-222 has been approved by FDA for use as an anesthetic for Salmonidae. MS-222 is used at the facility for tagging and sorting fish. In the future, the Discharger may use the anesthetic Aqui-S<sup>®</sup>, a water dispersible liquid anesthetic for fin fish, crustacea and shell fish, used under an INAD exemption. The Regional Board does not have specific toxicity information for MS-222 or Aqui-S<sup>®</sup> or estimates of potential discharge concentrations of MS-222 and Aqui-S<sup>®</sup> at this Facility. The Discharger is not proposing to discharge these chemicals to waters of the United States or waters of the State, but plans to use other means of disposal. Consequently, this Order does not include water quality-based effluent limitations for these anesthetics, but use and means of disposal of these chemicals must be reported as specified in the attached Monitoring and

Reporting Program. Also, this Order includes a provision requiring 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.

39. Oxytetracycline, also known by the brand name Terramycin<sup>®</sup>, is currently used by the Discharger in the hatchery building and becomes part of the Lower Raceway Series discharge. Oxytetracycline, 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 limits for oxytetracycline used in an immersion bath treatment were necessary in this Permit. 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. The information available to the Regional Board regarding discharges of oxytetracycline indicates that it is discharged at levels well below the lowest NOEC and NOAEL. Therefore, at this time, the Regional Board determined that oxytetracycline, when used in feed or 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 Permit 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 permit may be reopened to establish effluent limits based on additional use and toxicity information.
40. Penicillin G is currently used by the Discharger in the hatchery building and becomes part of the Lower Raceway Series discharge. Penicillin G is used for the control of bacterial infections; and is administered as a six hour bath. Maximum usage for four tanks would be 600 grams. This amount would yield a discharge of 0.22 mg/L. 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, 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 limits for Penicillin G were necessary in this Permit. 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. The information available to the Regional Board regarding discharges of Penicillin G indicates that it is discharged at levels well below the lowest NOEC and NOAEL. Therefore, at this time, the Regional Board determined that Penicillin G, when used in an immersion bath treatment, is not discharged from CAAP facilities in the Region 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 Permit does not include effluent limitations 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 permit may be reopened to establish effluent limits based on additional use and toxicity information.

41. Amoxicillin, erythromycin, florfenicol, and Romet-30<sup>®</sup> are not currently used but may potentially be used by the Discharger. Amoxicillin is injected into fish to control acute disease outbreaks through a veterinarian's prescription for extra-label use. Erythromycin (injected or used in feed formulations) and florfenicol (used in feed formulations) are antibiotics used to control acute disease outbreaks and must be used under an INAD exemption or a veterinarian's prescription for extra-label use. Romet-30<sup>®</sup>, also known by the trade name Sulfadimethoxine-oremtroprim, is an antibiotic used in feed formulations and is approved for use in aquaculture through FDA's NADA program for control of furunculosis in salmonids. 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 determined that amoxicillin (when injected into fish), erythromycin (when injected into fish or used as a feed additive), florfenicol and Romet-30<sup>®</sup> (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 Permit. Therefore, the Regional Board determined that amoxicillin, florfenicol and Romet 30<sup>®</sup> are not discharged from CAAP facilities in the Region 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 Permit does not include water quality-based effluent limitations for these substances; however, this Permit does require monthly monitoring and reporting of these substances as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information and this permit may be reopened to establish effluent limits based on additional use and toxicity information.
42. To treat enteric redmouth disease, the Discharger administers enteric redmouth bacterin. Enteric redmouth (or yersiniosis) bacterins are formulated from inactivated *Yersinia ruckeri* bacteria and may be used as an immersion or vaccine to help protect salmonid species from enteric redmouth disease caused by *Yersinia ruckeri*. These bacterins stimulate the fish's immune system to produce protective antibodies. The Discharger has indicated that it may use a vibrio vaccine 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. 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.

#### OTHER CONSIDERATIONS

43. CWC 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.*" CWC 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. R5-2004-0112 is necessary to assure compliance with waste discharge requirements and is incorporated by reference herein. The attached Monitoring and Reporting Program is established pursuant to CWC Sections 13267 and 13383.
44. 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.
45. 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.
46. 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.

47. The action to adopt an NPDES permit is exempt from the provisions of the California Environmental Quality Act (CEQA), Public Resources Code Section 21100, et seq., in accordance with Section 13389 of the CWC.
48. 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.
49. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.
50. 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. 96-037 is rescinded and that the State of 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:

**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 Finding Nos. 3, 5 or 6 is prohibited, and may be considered a violation of the Clean Water Act and the CWC.
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 CWC, 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.

**B. Effluent Limitations**

1. Effluent discharged into a surface water shall not have a pH less than 6.5 nor greater than 8.5 standard units.

2. The maximum daily discharge of flow through wastewater shall not exceed 26.7 mgd.
3. Effluent discharges shall not exceed the following limits at Discharge 002, Discharge 003, and Discharge 004:

<u>Constituent</u>	<u>Units</u>	<u>Average Monthly Limit</u>	<u>Maximum Daily Limit</u>
Suspended Solids <sup>1</sup> (net)	mg/L	5.0	15.0
Settleable Solids	mL/L	0.1	0.2
Formaldehyde	mg/L	0.65	6.7
Copper <sup>2</sup>	ug/L	<b>Calculate Limit based on Attachment C</b>	

<sup>1</sup> Effluent limitations for total suspended solids are net values (Net TSS concentration =Effluent TSS concentration less Influent TSS concentration).

<sup>2</sup> A daily maximum value for copper shall be considered non-compliant with the effluent limit only if it exceeds the effluent limitation and the reported minimum level (ML). The highest acceptable ML for calibration purposes is 0.5 ug/L.

**C. Discharge Specifications**

1. Neither the treatment nor the discharge shall cause a nuisance or pollution as defined by the CWC, Section 13050.
2. The discharge shall not cause degradation of any water supply.
3. The domestic sewage discharge shall be maintained within the designated disposal area at all times, and there shall be no direct discharge to surface waters or surface water drainage courses.
4. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the domestic wastewater treatment and leachfield areas.
5. As a means of discerning compliance with Discharge Specification No. 4, the dissolved oxygen content in the upper zone (1 foot) of the sewage lagoon shall not be less than 1.0 mg/l.
6. The domestic wastewater pond shall be managed to prevent breeding of mosquitoes. In particular:

- a. An erosion control program should assure that small coves and irregularities are not created around the perimeter of the water surface.
  - b. Weeds shall be minimized through control of water depth, harvesting, or herbicides.
  - c. Dead algae, vegetation, and debris shall not accumulate on the water surface.
7. Public contact with wastewater in the domestic wastewater pond and leachfield areas shall be precluded or controlled through such means as fences and signs, or acceptable alternatives.

**D. Groundwater Limitations**

The domestic waste discharge shall not cause groundwater under and beyond the disposal area, as determined by an approved well monitoring network, to:

1. Contain any of the following constituents in concentration greater than as listed or greater than natural background quality, whichever is greater:

<u>Constituent</u>	<u>Units</u>	<u>Limitation</u>
Total Coliform Organisms	MPN/100 mL	2.2
Total Dissolved Solids	mg/L	500
Nitrate (as N)	mg/L	10

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

**E. Best Management Practices (BMP) 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.

**F. 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 that are 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 the Facility's BMP plan. 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.

**G. Receiving Water Limitations for Coleman Canal**

Receiving water limitations are site-specific interpretations of water quality objectives contained in the Basin Plan. As such, they are a required part of this Order. However, a receiving water condition not in conformance with the limitation is not necessarily a violation of this 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 in Coleman Canal:

1. Fecal coliform concentrations, based on a minimum of not less than five samples for any 30-day period, to exceed a geometric mean of 200MPN/100 mL or more than ten percent of the total number of samples taken during any 30-day period to exceed 400MPN/100 mL.
2. Biostimulatory substances to be present which promote aquatic growths that cause nuisance or adversely affect beneficial uses.
3. Discoloration that causes nuisance or adversely affects beneficial uses.
4. Dissolved oxygen concentrations to fall below 7.0 mg/L, the monthly median of the mean daily dissolved oxygen concentration to fall below 85 percent of saturation in the main water mass or the 95<sup>th</sup> percentile concentration of dissolved oxygen to fall below 75 percent of saturation.
5. Floating material in amounts that cause nuisance or adversely affect beneficial uses.
6. Oils, greases, waxes, or other materials that result in a visible film or coating on the water surface or on objects in the water.

7. The normal ambient pH to fall below 6.5, exceed 8.5, or change by more than 0.5 units.
8. Pesticides to be present in concentrations in the receiving water, bottom sediments, or aquatic life in concentrations that adversely affect beneficial uses or in concentrations that exceed the lowest levels technically and economically achievable.
9. Radionuclides to be present in concentrations that exceed maximum contaminant levels specified in the California Code of Regulations, Title 22; that harm human, plant, animal or aquatic life; or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.
10. Suspended sediment load and suspended sediment discharge rates to be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
11. Deposition of material that causes nuisance or adversely affects beneficial uses.
12. Suspended material in concentrations that adversely affect beneficial uses.
13. Taste or odor-producing substances to impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, or to cause nuisance or adversely affect beneficial uses.
14. An increase in the normal ambient temperature of waters by more than 5°F (3°C).
15. Toxic pollutants to be present in concentrations that adversely affect beneficial uses or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
16. The turbidity of receiving waters to increase over background levels by more than:
  - 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.

In determining compliance with the above limitations, appropriate averaging periods may be applied upon approval by the Executive Officer.

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

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.

## **H. Provisions**

1. The Discharger shall comply with the attached Monitoring and Reporting Program No. R5-2004-0112, 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 criterion, then this Order may be reopened to include effluent limit(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 limit or determine if an effluent limit 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 additional Discharge Monitoring Reports. The submittal date shall be no later than the submittal date specified in the Monitoring and Reporting Program for Discharge Self-Monitoring Reports.

2. The Discharger shall comply with all the items of 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."
3. The Discharger shall comply with the standards contained in the Health and Safety Code, Chapter 6.67, Aboveground Storage of Petroleum.
4. This Order authorizes the discharge of copper sulfate, sodium chloride, acetic acid, potassium permanganate, hydrogen peroxide, Chloramine-T, formalin, Oxytetracycline, Romet-30<sup>®</sup>, Florfenicol, Penicillin G, amoxicillin, erythromycin, enteric redmouth bacterin, vibrio vaccine, MS-222, carbon dioxide, and Aqui-S<sup>®</sup>, in accordance with the effluent limitations and other conditions described 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 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 INAD, 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.

5. 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 potassium permanganate, hydrogen peroxide, PVP Iodine, and Chloramine-T 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 for potassium permanganate, hydrogen peroxide, and Chloramine-T based on additional toxicity testing and other available information.
6. The Discharger may conduct studies pertaining to Facility operations, the effluent discharge, and the receiving water. For example, such studies may include a site-specific metals translator study or a mixing zone and dilution study. The Regional Board will review such studies and, if warranted, will reopen this permit to make appropriate changes.
7. In accordance with the requirements in Section E. – 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 or waters of the State. 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 and USEPA.

8. The Discharger shall report promptly to the Regional Board any material change or proposed change in the character, location, or volume of the discharge or water treatment chemicals or biocides used. Notification on water treatment chemical changes shall include information from the manufacturer on toxicity and hazardous classifications.
9. 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.
10. 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.
11. 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 CWC. 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 Regional Board, Central Valley Region, on 10 September 2004.

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THOMAS R. PINKOS, Executive Officer

MEB:

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

NPDES NO. CA0004561

MONITORING AND REPORTING PROGRAM NO. R5-2004-0112

FOR  
STATE OF CALIFORNIA  
DEPARTMENT OF FISH AND GAME AND  
DARRAH SPRINGS FISH HATCHERY  
SHASTA COUNTY

**INTRODUCTION**

This Monitoring and Reporting Program is issued pursuant to California Water Code §13267 and §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 in accordance with an approved Quality Assurance-Quality Control Program.

**INFLUENT MONITORING**

Sampling stations shall be established and located where representative samples of the Darrah Springs and Pacific Power Ditch water supplies from above the facility can be obtained. Samples shall be collected at approximately the same time as monthly effluent samples. Influent monitoring shall include at least the following:

<u>Constituent</u>	<u>Unit</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Total Suspended Matter	mg/L	Grab	Monthly

**EFFLUENT MONITORING (Discharges 002, 003, and 004)**

Effluent samples shall be collected from Discharges 002 and 003. Effluent samples shall be collected of the combined discharge from the Upper Raceways at Discharge 004. Effluent samples shall be representative of the volume and quality of the discharge. Effluent samples shall be collected during or immediately following raceway cleaning or administration of drug or chemical treatments and must be representative of the volume and quality of the discharge at the time when representative levels of solids, drugs, chemicals, or other pollutants are present in the discharge. Time of collection of samples shall be recorded. Effluent monitoring shall include the following:

<b><u>Constituent</u></b>	<b><u>Units</u></b>	<b><u>Type of Sample</u></b>	<b><u>Sampling Frequency</u></b>
Effluent Flow	cfs	Calibrated meter, weir, or other approved method	Recorded weekly
Total suspended solids (TSS)	mg/L	Grab	1/month
<b>Net TSS</b> (effluent minus influent)	mg/L	Net calculation	1/month
Settleable solids	mL/L	Grab	1/month
pH	units	Grab	1/month
Chloride <sup>1</sup>	mg/L	Grab	1/month
Conductivity @ 25°C (EC) <sup>1</sup>	µmhos/cm	Grab	1/month
Formaldehyde <sup>2</sup>	mg/L	Grab	1/month during use
Hydrogen peroxide <sup>3</sup>	mg/L	Grab	1/month during use
Potassium permanganate <sup>3</sup>	mg/L	Grab	1/month during use
Chloramine-T <sup>3</sup>	mg/L	Grab	1/month during use
Copper (Total Recoverable) <sup>4</sup>	µg/L	Grab	1/week during use

<sup>1</sup> In months when sodium chloride or calcium chloride is added to waters of the Facility, conductivity shall be measured during sodium chloride use.

<sup>2</sup> In months when formalin is added to the waters of the Facility, formaldehyde concentration shall be measured during formalin use.

<sup>3</sup> The analytical method used for 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.

<sup>4</sup> 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 ug/L. The sample shall be collected during the time of peak discharge of copper, no later than one hour after start of treatment. Receiving water hardness upstream of the discharge (at R-1 and/or R-3) shall be sampled simultaneously.

### RECEIVING WATER MONITORING

All receiving water samples shall be grab samples collected at a depth of 6 to 12 inches below the surface. Receiving water monitoring shall include at least the following:

<u>Station</u>	<u>Description</u>
R-1	Darrah Creek, upstream of the second diversion dam.
R-2	Darrah Creek, downstream at Ward's Pond.
R-3	Pacific Power Ditch, upstream of diversion into upper raceway series.
R-4	Pacific Power Ditch, 50 feet downstream of Discharge 004.

<u>Constituent</u>	<u>Unit</u>	<u>Station</u>	<u>Sampling Frequency</u>
Hardness <sup>1</sup>	mg/L	R-1, R-3	Weekly During Copper Use
pH	standard units	All	1/month
Conductivity @ 25°C (Specific Conductance) <sup>2</sup>	µmhos/cm	All	1/month
Temperature	°C	All	1/month
Dissolved Oxygen	mg/L	R-2, R-4	1/month
Turbidity	NTU	All	1/month

<sup>1</sup> When a copper sulfate solution is added to the waters of the Facility, hardness at R-1 and R-3 shall be sampled and reported with the copper results.

<sup>2</sup> In months when sodium chloride is added to waters of the Facility, conductivity shall be measured during sodium chloride use.

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reaches bounded by Stations R-1 through R-2, and R-3 through R-4. Attention shall be given to the presence or absence of:

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

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

### SEPTIC TANK MONITORING AND INSPECTIONS

Septic tank maintenance inspections shall be performed at least once per year. Information concerning inspections and maintenance activities (including, but not limited to, pumping, replacement, and repairs) shall be included in the monitoring reports submitted to the Regional Board.

### LEACHFIELD MONITORING

The Discharger shall inspect leachfield areas and submit the results in the monthly monitoring report. Monitoring shall include any observations of seeps, erosion, field saturation, ponding liquid, the presence of nuisance and other field conditions.

### SEWAGE LAGOON MONITORING

The following shall constitute the monitoring program for the sewage lagoon:

<u>Constituent</u>	<u>Unit</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Freeboard	Feet	Visual	Monthly
Visual observation of weeds, scum, or solids buildup on ponds	--	Visual	Monthly

### GROUNDWATER MONITORING

The following shall constitute the groundwater monitoring program for the well adjacent to the sewage lagoon.

<u>Parameter</u>	<u>Unit</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Depth of water from bottom of sewage lagoon	Feet	Visual	Quarterly
Total and Fecal Coliform	MPN/100mL	Grab	Quarterly <sup>1</sup>

<sup>1</sup> When depth to ground water is less than 5 feet as measured from the bottom of the sewage lagoon.

### MONTHLY DRUG AND CHEMICAL USE REPORT

The following information shall be submitted for all aquaculture drugs or chemicals used at the Facility:

- 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 Darrah Creek or Pacific Power Ditch 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 Darrah Creek or Pacific Power Ditch.
- 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

$C = (\text{treatment concentration}) \times (\text{flow in treatment area}) \div (\text{flow at point of discharge})$

#### **Example: Potassium permanganate concentration**

$C = 2.0 \text{ mg/L (potassium permanganate)} \times \frac{0.45 \text{ mgd (flow through treatment area)}}{5.0 \text{ mgd (flow at point of discharge)}}$

$C = 2.0 \text{ mg/L} \times 0.09$

**C = 0.18 mg/L potassium permanganate 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 this Order may be reopened 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 received to date, discharge of priority pollutants other than metals is highly unlikely. Accordingly, the Regional Board is requiring, as part of this Monitoring and Reporting Program, that the Discharger conduct effluent and receiving water monitoring (at a receiving water station upstream of the point of discharge) and analysis of 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            | ▪ Lead     |
| ▪ Arsenic             | ▪ Mercury  |
| ▪ Beryllium           | ▪ Nickel   |
| ▪ Cadmium             | ▪ Selenium |
| ▪ Chromium (III)      | ▪ Silver   |
| ▪ Chromium (IV)       | ▪ Thallium |
| ▪ Copper <sup>1</sup> | ▪ Zinc     |

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<sup>1</sup> The Order includes effluent limitations for copper; therefore, more frequent effluent monitoring for copper is required when copper sulfate is used, as specified elsewhere in this Monitoring and Reporting Program.

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.

<b>Method Description</b>	<b>EPA Method</b>	<b>Constituents</b>
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 DHS. 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 U.S. EPA 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.

### **GENERAL REPORTING REQUIREMENTS**

The Discharger shall implement the above monitoring program on the first day of the month following adoption of the Order. The Discharger shall submit monthly monitoring reports to the Regional Board by the **first day of the second month** following sample collection (i.e., the January report is due by 1 March). Annual monitoring reports shall be submitted by the first day of the second month following each calendar year, respectively. All reports submitted in response to this Order shall comply with signatory requirements of Standard Provision D.6.

By **1 February** 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:
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 Discharge Prohibitions, Discharge Specifications, Effluent Limitations or Groundwater 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.

Ordered by: \_\_\_\_\_  
THOMAS R. PINKOS, Executive Officer

\_\_\_\_\_  
10 September 2004  
(Date)

## INFORMATION SHEET

ORDER NO. R5-2004-0112  
STATE OF CALIFORNIA DEPARTMENT OF FISH AND GAME  
DARRAH SPRINGS FISH HATCHERY  
SHASTA COUNTY

### FACILITY DESCRIPTION

The California Department of Fish and Game (hereafter Discharger) operates the Darrah Springs Fish Hatchery (Facility) located west of Manton in Section 29, T30N, R1W, MDB&M. The Facility lies within the Battle Creek Hydrologic Subarea No 507.12. The hatchery facilities are spread out over the 80 acre property and consist of 20 residences for hatchery staff, a large hatchery building, two separate raceway series (an Upper Raceway Series and a Lower Raceway Series), a large spring-fed Brood Pond, a main office, a vehicle maintenance building, a former freezer building (used only for storage at this time) and multiple bulk feed storage bins. The Discharger utilizes water from Darrah Springs and the Pacific Power Ditch and discharges fish hatchery wastewater directly to Darrah Creek and the Pacific Power Ditch, both of which are tributary to the Coleman Canal, a tributary to Battle Creek, a water of the United States and waters of the State.

Based on Annual Reports for the past four years (2000-2003), the Facility has an average annual production of 414,029 pounds of rainbow trout. Average annual feed usage for this period was 564,670 pounds.

*Amount of fish raised and amount of feed used at Darrah Springs Fish Hatchery 2000-2003:*

	2000	2001	2002	2003
<b>Amount of fish raised (lbs)</b>	445,295	423,948	368,465	418,400
<b>Amount of feed used (lbs)</b>	557,890	557,430	640,370	502,990

No egg harvesting takes place at the Facility and all eggs are imported from other DFG hatcheries. An average of 1.5 million trout eggs are incubated and reared in the hatchery building annually. The Discharger currently discharges an average of 18.7 mgd (29 cfs) of flow-through hatchery wastewater from the entire Facility at three separate discharge locations, Discharge 002, 003 and 004, as shown on Attachment B, a part of this Order. Discharge 001 to Darrah Creek from the Hatchery Building is currently not used but is retained in this Order in the event that future use occurs. The Facility has a design maximum flow rate of 26.7 mgd (41.4 cfs).

*Hatchery Building:* The hatchery building is fed by surface water diversion from Darrah Creek, as shown on Attachment B. The hatchery building contains 58 single hatchery troughs and 30 deep tanks. Currently, all the flow-through wastewater from the hatchery building is discharged back into the Lower Raceway Series.

Brood Ponds: Several unnamed springs supply water to the Brood Ponds. The Brood Ponds consist of three concrete-lined ponds, approximately 450 feet in length. According to a 1994 study conducted by DFG's hatchery consultant, approximately 4.8 mgd (7.5 cfs) of flow-through hatchery wastewater is discharged into Darrah Creek from the Brood Pond Series at Discharge 002. However, at times, approximately 80 percent of the water from the Brood Ponds is pumped to the Lower Raceways Series where it is aerated and re-circulated through the Lower Raceway Series.

Lower Raceway Series: There are six large raceways associated the Lower Raceway Series. The Lower Raceway Series is supplied by several water sources, including a surface water diversion from Darrah Creek, flow-through wastewater from the hatchery building, and water re-circulated water from the Brood Ponds (as shown on Attachment B). An average of 11.6 mgd (18 cfs) flow-through wastewater from the Lower Raceway Series is discharged directly back into Darrah Creek, (Discharge 003). Darrah Creek flows into Ward's Pond, located a quarter mile downstream of the Lower Raceway Series. Flow from Ward's Pond is diverted into the Coleman Canal via the Asbury Pumping Station and Asbury Siphon. If overflow occurs from Ward's Pond water enters Baldwin Creek, a tributary of Battle Creek. The Lower Raceway Series does not have a settling basin, therefore, all flow-through wastewater is discharged directly back into Darrah Creek without benefit of on-site settling.

Upper Raceway Series: As shown on Attachment B, the Upper Raceway Series is supplied by a surface water diversion from the Pacific Power Ditch. An average of 7.1 mgd (11 cfs) of flow-through wastewater is discharged back into the Pacific Power Ditch from the Upper Raceway Series (Discharge 004). There are four separate raceways associated with the Upper Raceway Series, each with their own headworks. At certain times of the year, water from the each raceway is circulated through an aeration tower at the raceway mid-point. There is no settling basin associated with the Upper Raceway Series, and all flow-through wastewater is discharged directly to the Pacific Power Ditch.

Approximately 20 people, consisting of employees and their family members, live on the grounds of Darrah Springs Fish Hatchery. Potable water is supplied from a domestic well. Domestic wastewater from the Facility is discharged to three separate septic tank/leachfield systems as shown on Attachment B. The easterly residences discharge into a septic tank/leachfield system (Leachfield #1). The residences near the Upper Raceway Series discharge into a community septic tank/leachfield system adjacent to the residences (Leachfield #2). Domestic sewage from the office building and hatchery building discharges into a third septic tank/leachfield system (Leachfield #3), which can discharge to a sewage lagoon when necessary during the rainy season. A sewage lagoon measuring approximately 80 by 40 feet and 15 feet deep was constructed to accommodate excess sewage from the northern leachfield (primarily during the rainy season). A groundwater monitoring well was installed in 1997 adjacent to the lagoon. A barbwire fence with a gate encircles the lagoon.

The Facility has one 1,000-gallon Convault tank for gasoline. Limited vehicle maintenance is performed on-site in the Facility's garage. There is "new" oil stored in the garage adjacent to the

shop. Used oil, oil filters and extra oil are hauled on a routine basis by a licensed hazardous waste hauler.

Chemicals are used at the Facility 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. There is a specific parasite at Darrah Springs Fish Hatchery, known as “gill fluke”, that a majority of the chemicals are used to treat. Chemicals currently used at the Facility include copper sulfate, acetic acid, hydrogen peroxide, potassium permanganate, PVP Iodine, and sodium chloride (salt). To treat enteric redmouth disease, the Discharger administers enteric redmouth bacterin. All chemicals used at the fish hatchery are stored in a locked area within the former ice storage building. Chemicals that are not currently used at the Facility, but may possibly be used in the future include Formalin (as a 37% formaldehyde, methanol-free solution) and Chloramine-T. Antibiotics such as Oxytetracycline (Terramycin<sup>®</sup>), Amoxicillin trihydrate, Romet-30<sup>®</sup> (Sulfadimethoxine-ormetoprim), erythromycin, and Florfenicol may be used during periods of disease outbreak. Penicillin G, an antibiotic, may be used as an immersive bath treatment during periods of disease outbreak at the Facility. Tricane methanesulfonate (MS-222), carbon dioxide and Aqui-S<sup>®</sup> may be used to anesthetize fish. Vaccines, such as Vibrio vaccine may also be used.

### **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. 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, 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. 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 No. 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 Regional Board has considered Resolution No. 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 gonadotropin (Chlorulun<sup>®</sup>), used for spawning;
2. Oxytetracycline (Terramycin<sup>®</sup>), an antibiotic;
3. Sulfadimethoxine-orometoprim (Romet-30<sup>®</sup>), an antibiotic;
4. Tricaine methanesulfonate (MS-222, Finquel<sup>®</sup> and Tricaine-S), an anesthetic;
5. Formalin (Formalin-F<sup>®</sup>, Paracide F<sup>®</sup> and PARASITE-S<sup>®</sup>), 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<sup>®</sup>, 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 Order.

- ***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.

### **RECEIVING WATER BENEFICIAL USES**

The Basin Plan at page II-2.00 states: "Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams." Furthermore, the

Regional Board generally is required to apply the beneficial uses of municipal and domestic supply (MUN) to surface waters based on State Board Resolution No. 88-63, which was incorporated in the Basin Plan pursuant to Regional Board Resolution No. 89-056. The Basin Plan does not specifically identify beneficial uses for Coleman Canal, but does identify present and potential uses for Battle Creek, to which Coleman Canal is a tributary.

The beneficial uses of Battle Creek are agricultural irrigation and stock watering (AGR), hydroelectric power generation (POW), water contact recreation and canoeing and rafting (REC-1), non-contact water recreation (REC-2), warm freshwater aquatic habitat (WARM) and warm spawning habitat (SPWN – WARM), cold freshwater aquatic habitat (COLD), cold fish migration habitat (MIGR – COLD), and cold spawning habitat (SPWN – COLD), and wildlife habitat (WILD). The Basin Plan on page II-1.00 states: “Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning...” and with respect to disposal of wastewaters states that “...disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses.” In reviewing whether certain existing and/or potential uses of Battle Creek apply to Coleman Canal, the Regional Board has considered that the quality of water in Coleman Canal affects the water quality downstream in Battle Creek. Water rights have been assigned downstream in Battle Creek for both agriculture and additional aquaculture uses. Coleman Canal downstream is used for aquaculture. In addition, portions of the flow from the discharge may be diverted for irrigation during the irrigation season. Thus, the Regional Board finds that the beneficial uses identified in the Basin Plan for Battle Creek and, based on State Board Resolution No. 88-63, the beneficial use of municipal and domestic supply (MUN), are applicable to Coleman Canal.

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

### **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.

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. The Regional Board is establishing effluent limitations for discharges of TSS and settleable solids from this Facility. 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 No. 96-037. 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. 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. 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.

#### **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.

### **WATER QUALITY-BASED EFFLUENT LIMITATIONS**

On 11 December 2000, the Discharger was issued a letter under the authority of California Water Code Section 13267 requesting effluent and receiving water monitoring to perform a reasonable potential analysis. The Discharger collected effluent and receiving water samples on 11 February 2003 to determine if the priority pollutants established in the CTR and NTR were detected. Analytical results were submitted for volatile substances, semi-volatile substances, metals, asbestos, 2,3,7,8-TCDD dioxin, and sixteen other dioxin congeners. None of the priority pollutants were detected at concentrations that would cause or contribute to an in-stream excursion above a water quality objective. The effluent sample for priority pollutant metals was collected at a time when the Discharger was not using copper sulfate for disease control. Based on additional analyses conducted during the use of copper sulfate the Regional Board finds that the discharge does have a reasonable potential to cause or contribute to an in-stream excursion above the CTR objective (acute and chronic) criteria for copper in the receiving water during the copper treatments. Effluent limitations for copper are included in this Order.

Based 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 finds that the discharge has a reasonable potential to cause or contribute to an in-stream excursion above numeric or narrative water quality objectives for copper, pH, and formaldehyde. Effluent limitations for these constituents are included in this Order. The Regional Board is not obligated to delegate the assimilative capacity of receiving waters to a Discharger. Therefore, the Regional Board establishes water quality-based effluent limitations without benefit of dilution in this Order. Water quality-based effluent limitations are based on the application of water quality criteria or objectives at the point of discharge.

#### **CTR Constituents**

Copper, primarily in the form of copper sulfate, is used in fish hatcheries to control algae and is also used as a flush treatment to control external parasites and bacteria on fish. The Discharger reports using up to 270 grams of copper sulfate crystals per raceway, with one raceway treated at a time. Annual copper sulfate usage ranged from 144 lbs in 2000 to 291.3 lbs in 2003. Copper sulfate crystals are pre-mixed with water and acetic acid (to dissolve the copper), and the solution is added to the raceway headworks. The Discharger estimates there is an estimated 1-hour flush of copper sulfate through a raceway. At the minimum flow through the Facility, and with the maximum use of copper sulfate per raceway treatment, the maximum calculated concentration of copper in a 1-hour flush is 150 ug/L in the Upper Raceway Series and 240 ug/L in the Lower Raceway Series. Maximum usage in the hatchery building would be 360 grams when treating 15 tanks, and 20 troughs (or about half the units at one time). This amount of copper sulfate used in the hatchery building would provide a 2.5-hour discharge of 80 ug/L total copper. The Discharger conducted monitoring in 2002 and 2003, taking grab samples during copper treatments of one raceway at a

time. Actual copper concentrations measured during 21 treatments varied with the flow and were dependent on when the sample was taken during the treatment. The maximum reported concentration was 160  $\mu\text{g/L}$  during the copper treatments of one raceway at a time.

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 translator. 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 0.960 is used for translating the dissolved copper criterion into a total recoverable effluent concentration with no dilution. However, the CTR acute aquatic life criterion for copper is not applicable to the Sacramento River or its tributaries above Hamilton City. Battle Creek is tributary to the Sacramento River above Hamilton City. Therefore, the applicable copper criterion for protection of aquatic life from acute effects is a site-specific criterion specified in the Basin Plan. The applicable chronic criterion for copper is from the CTR. Both of these criteria are dependent on the hardness of the receiving water. The Discharger has reported hardness values ranging from 36 mg/L to 137 mg/L in the discharge and receiving water. At a hardness of 25 mg/L, the applicable acute and chronic copper criteria are 3.8  $\mu\text{g/L}$  and 1.9  $\mu\text{g/L}$  respectively. At hardness of 50 mg/L, these criteria increase to 7.2  $\mu\text{g/L}$  (acute) and 3.6  $\mu\text{g/L}$  chronic and at a hardness of 100 mg/L they are 13.4  $\mu\text{g/L}$  (acute) and 6.7  $\mu\text{g/L}$  (chronic). Receiving water hardness has ranged from 69 to 94 mg/L during monitoring of copper treatments in 2003. Based on the calculated concentration as well as the actual measurements during treatments, the copper concentration in the effluent has the reasonable potential to exceed the water quality objective. Therefore, this Order includes both maximum daily and average monthly effluent limitations for copper. The Basin Plan criterion is the most limiting criterion; therefore, the effluent limitations are based on the Basin Plan criterion. These effluent limitations are adjusted for hardness as shown in Attachment C. Below is a sample calculation of these effluent limitations:

Assuming:

- The receiving water is a tributary to the Sacramento River above Hamilton City.
- The receiving water hardness is 75 mg/L (as  $\text{CaCO}_3$ ).
- No in-stream dilution allowance.
- Coefficient of Variation (CV) = 0.6 for the lognormal distribution of pollutant concentrations in effluent.

### ***Acute criterion***

The Basin Plan specifies an acute criterion for protection of aquatic life for discharges to the Sacramento River and its tributaries above Hamilton City. The criterion is expressed as follows:

At a hardness of 75 mg/L (as CaCO<sub>3</sub>)

$$\begin{aligned} \text{Cu}_{\text{acute}} \text{ (in } \mu\text{g/L)} &= e^{(0.905)(\ln \text{ hardness})-1.612} \\ &= e^{(0.905)(4.317)-1.612} \end{aligned}$$

$$\text{Cu}_{\text{acute}} = 9.93 \mu\text{g/L}$$

This criterion, however, is expressed as a **dissolved concentration**. Effluent limitations for most metals must be expressed as **total recoverable concentrations** (40 CFR 122.45(c)). To translate the dissolved metal criterion into an equivalent total recoverable effluent concentration allowance (ECA), the Region Board used the conversion factor from the CTR as the translator. For copper, the conversion factor for the acute, freshwater aquatic life criterion is 0.960. Therefore, the total recoverable ECA (assuming no dilution) is as follows:

$$\text{ECA}_{\text{acute}} = 9.93 \mu\text{g/L} / 0.960 = 10.34 \mu\text{g/L}$$

### ***Chronic criterion***

The CTR specifies a chronic criterion, **expressed as a dissolved concentration**. Once again, as with the acute criterion, the Regional Board assumed that the translator between the dissolved criterion and a total recoverable ECA is equal to the CTR conversion factor for converting between a total recoverable and dissolved chronic criterion for copper. Thus, the total recoverable ECA for the meeting the chronic criterion, assuming no dilution, may be expressed as follows:

$$\begin{aligned} \text{ECA}_{\text{chronic}} \text{ (in } \mu\text{g/L)} &= e^{(0.8545)(\ln \text{ hardness})-1.702} \\ &= e^{(0.8545)(317)-1.702} \end{aligned}$$

$$\text{ECA}_{\text{chronic}} = 7.30 \mu\text{g/L}$$

### ***Effluent Concentration Allowance (ECA) based on acute criterion with no dilution allowance***

$$\text{ECA}_{\text{a}} = 10.34 \mu\text{g/L}$$

### ***ECA based on chronic criterion with no dilution allowance***

$$\text{ECA}_{\text{c}} = 7.30 \mu\text{g/L}$$

### ***Long Term Average (LTA) concentration based on acute ECA***

$$\begin{aligned} \text{LTA}_{\text{a}} &= 10.34 \mu\text{g/L} \times 0.321 = 3.32 \mu\text{g/L} \\ &\text{(where 0.321 = acute ECA multiplier at 99\% occurrence probability and 99\% confidence)} \end{aligned}$$



***LTA concentration based on chronic ECA***

$$LTA_c = 7.30 \mu\text{g/L} \times 0.527 = 3.84 \mu\text{g/L}$$

(where 0.527 = chronic ECA multiplier at 99% occurrence probability and 99% confidence)

***Most Limiting LTA concentration***

$$LTA = 3.32 \mu\text{g/L}$$

***Maximum Daily Effluent Limit (MDEL)***

$$MDEL = LTA \times 3.11$$

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

$$MDEL = 3.32 \mu\text{g/L} \times 3.11 = \mathbf{10.3 \mu\text{g/L}}$$

***Average Monthly Effluent Limit (AMEL)***

$$AMEL = LTA \times 1.55$$

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

$$AMEL = 3.32 \mu\text{g/l} \times 1.55 = \mathbf{5.1 \mu\text{g/L}}$$

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.” The effluent limitations for copper, however, are based on the Basin Plan criterion and, therefore, compliance schedules for meeting these limitations cannot be included in this Order. However, the Regional Board may adopt other Orders, such as a Cease and Desist Order, allowing the Discharger a period of time to fully comply with the effluent limit for copper.

**Non-CTR Constituents**

***pH***

The Basin Plan contains water quality objectives for pH in the form of a range of acceptable pH values (measured in standard units). The Regional Board determined that the discharge from this Facility may cause, have the reasonable potential to cause, or contribute to an in-stream excursion of the numeric water quality objective for pH from the Basin Plan. In the current permit, the Regional Board established effluent limitations in the form of acceptable range of pH between 6.5 and 8.5 standard units for discharges to Coleman Canal. This pH limit is carried over to this permit.

### ***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 proposed for use 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 Pesticide Investigation Unit (DFG Pesticide Unit) has initiated biotoxicity studies to determine the aquatic toxicity of certain aquaculture drugs and chemicals commonly used at their CAAP facilities in the Region; specifically, formalin, hydrogen peroxide, oxytetracycline, penicillin G, potassium permanganate, and PVP iodine and is required by this Order to conduct toxicity testing on several additional aquaculture drugs and chemicals.

### ***Formalin as Formaldehyde***

Formalin (as a 37% formaldehyde solution) is rarely used at the hatchery with the last use reported in February 1998. The Discharger reports that formalin may be used in the future as a replacement treatment for copper. The Raceway use would be a six hour drip at 25 mg/L. Maximum usage would be 11 and 12 gal for the Upper and Lower Raceway series, respectively. The seven hour discharge from the Upper Raceway Series would contain 5.3 mg/L formalin, or 1.9 mg/L formaldehyde. The Lower Raceway Series discharge would contain 3.5 mg/L formalin, or 1.2 mg/L formaldehyde. Because the Facility is a flow-through facility without on-line settling, formaldehyde is expected to be present in the discharge for approximately the same duration as treatment, typically 8-hours or less. Use in the hatchery building would be well below the amount used in raceway treatments (not more than a ½ gallon per trough). Formalin is approved through FDA’s NADA program for use in controlling external protozoa and monogenetic trematodes on fish, and for controlling fungi of the family *Saprolegniaceae* in food-producing aquatic species (including trout and salmon). For control of other fungi, formalin may be used under an INAD

exemption. Formalin is used as a “drip” treatment to control fungus on fish eggs, or as a “flush” treatment in raceways of 1-8 hours in duration. Formalin may be applied in multiple treatments over the course of a given month, or may be applied in raceways for up to 8 hours at a time.

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 = 10. 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 DFG Pesticide Unit conducted biotoxicity studies to determine the aquatic toxicity of formaldehyde using *Pimephales promelas*, and *Ceriodaphnia dubia* (*C. dubia*) in accordance with the analytical methods specified in EPA600/4-91-002, *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 *C. dubia* in accordance with methods specified in EPA600/4-90/027, *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<sub>50</sub>.

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)
<i>Ceriodaphnia dubia</i>	2.4	5.8 <sup>1</sup> 1.3 <sup>2</sup>	1.3 <sup>1</sup> <1.3 <sup>2</sup>	5.8	1.3
<i>Pimephales promelas</i>	23.3	9.09	2.28	--	--
<i>Selenastrum capricornutum</i>	<5.2	--	--	--	--

<sup>1</sup> Survival

<sup>2</sup> 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)
<i>C. dubia</i> —2-hour exposure	73.65	46.3	20.7
<i>C. dubia</i> —8-hour exposure	13.99	15.3	6.7

The Regional Board considered the results of both acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limits for formalin as formaldehyde were necessary. Results of chronic toxicity tests indicated *C. dubia* was the most sensitive species, with a 7-day NOEC value of 1.3 mg/L formaldehyde for survival and less than 1.3 mg/L for reproduction (the Regional Board used an NOEC of 1.3 mg/L). Acute toxicity tests conducted using *C. dubia* showed a 96-hour NOAEL of 1.3 mg/L formaldehyde. The additional acute toxicity tests conducted using an 8-hour exposure resulted in a 96-hour NOAEL concentration of 6.7 mg/L formaldehyde.

Based on the proposed application rates for formalin proposed by DFG, the Regional Board determined that if formalin is used at this Facility in the future, formaldehyde may be 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 includes water quality-based effluent limitations for formaldehyde. Because the Facility is a flow-through facility without on-line settling, formaldehyde is expected to be present in the discharge for approximately the same duration as treatment, typically 8-hours or less. Therefore, the Regional Board is establishing a maximum daily effluent limitation of 6.7 mg/L with the requirement that the Facility monitor for formaldehyde during formalin treatment. This limit is based on the observed 96-hour NOAEL with 8-hour exposure to formaldehyde. In addition, the Regional Board is establishing an average monthly effluent limitation of 0.65 mg/L formaldehyde based on the 96-hour NOAEL with 96-hours of exposure calculated using procedures from USEPA's TSD. This limit will ensure protection of aquatic life from longer-term exposure to formaldehyde through successive treatments with formalin. The previous Order No. 96-037 included a less stringent daily maximum limitation for formaldehyde of 5 mg/L based on a USEPA Health Advisory for acute 10-day exposure. Based on the above new information for short term toxicity for an 8-hour exposure, which was not available at the time of issuance of the previous Order, and inclusion of the average monthly effluent limitation of 0.65 mg/L, the establishment of a less stringent daily maximum effluent limitation is appropriate. The formaldehyde limitations established in this permit are consistent with federal and State antidegradation and antibacksliding requirements.

The Regional Board used USEPA's TSD guidance to calculate the AMEL effluent limitation 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***

$$ECA_a = 1.3 \text{ mg/L}$$

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

$$ECA_c = 1.3 \text{ mg/L}$$

***Long Term Average concentration based on acute ECA***

$$LTA_a = 1.3 \text{ mg/L} \times 0.321 = 0.42 \text{ mg/L}$$

(where 0.321 = acute ECA multiplier at 99% occurrence probability and 99% confidence)

***Long Term Average concentration based on chronic ECA***

$$LTA_c = 1.3 \text{ mg/L} \times 0.527 = 0.69 \text{ mg/L}$$

(where 0.527 = chronic ECA multiplier at 99% occurrence probability and 99% confidence)

***Most Limiting LTA concentration***

$$LTA = 0.4173 \text{ mg/L}$$

***Average Monthly Effluent Limit***

$$AMEL = LTA \times 1.55$$

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

$$AMEL = 0.42 \text{ mg/L} \times 1.55 = \mathbf{0.65 \text{ mg/L as formaldehyde}}$$

***Sodium Chloride***

Sodium chloride (salt) is used in conjunction with other flush treatments (such as copper sulfate) to control fish diseases at the hatchery. Annual usage of sodium chloride ranged from a minimum of 59,650 lbs in 2000 to a maximum of 113,500 lbs in 2003. Maximum treatment is 200 lbs. per raceway, which allows a one-hour discharge of 80.8 mg/L sodium chloride in the Upper Series, and 49.5 mg/L sodium chloride in the Lower Series, respectively. Salt usage in the hatchery building is below the maximum usage for the raceways, and is discharged to the Lower Series. FDA considers sodium chloride an unapproved new animal drug of low regulatory priority (LRP drug) for use in aquaculture. Consequently, FDA is unlikely to take regulatory action if an appropriate grade is used, good management practices are followed, and local environmental requirements are met. There are no numeric water quality objectives for conductivity, TDS, or chloride in the NTR, CTR, or Basin Plan for Coleman Canal or Battle Creek. The Basin Plan does contain a narrative objective

for chemical constituents that states, in part, “Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.” Agricultural irrigation is a beneficial use of the receiving water. *Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1* (R.S. Ayers and D.W. Westcot, Rome, 1985), recommends that the conductivity level in waters used for agricultural irrigation not exceed 700  $\mu\text{mhos/cm}$  (Agricultural Water Quality Goal) because it will reduce crop yield for sensitive plants. The Agricultural Water Quality Goal for TDS is 450 mg/L. USEPA’s recommended ambient water quality criteria for chloride for the protection of freshwater aquatic life are 230 mg/l as a one-hour average, and 860 mg/l as a four-day average. The Agricultural Water Quality Goal for chloride is 106 mg/L. The discharge of sodium chloride from the Facility at the application rates described by the Discharger will not cause, have the reasonable potential to cause, or contribute to an in-stream excursion of applicable water quality criteria or objectives. Monitoring of conductivity and chloride is required and monthly use of sodium chloride must be reported as specified in the Monitoring and Reporting Program.

### ***Acetic Acid***

Acetic acid is used in conjunction with copper flushes to help put the copper sulfate into solution. Annual usage of acetic acid over the past four years has ranged from a minimum of 45.2 gal in 2001 to a maximum of 106.25 gal in 2003. The maximum usage per raceway is 120 ml, resulting in a discharge concentration of 0.1 mg/L in the Upper Series and 0.06 mg/L in the Lower Series. Acetic acid may also potentially be used by the Discharger as a “flush” treatment in raceways for the control of external parasites on fish. The Basin Plan contains water quality objectives for pH in the form of a range of acceptable pH values (measured in standard units). Since acetic acid will lower the pH of the water the Regional Board has included an effluent limit for pH. Monthly use of acetic acid must be reported as specified in the attached Monitoring and Reporting Program.

### ***Hydrogen Peroxide***

Hydrogen peroxide (35 %  $\text{H}_2\text{O}_2$ ) is used for the control of external parasites at the hatchery. The Discharger reports a one-hour drip treatment using 15 gallons in the Upper raceway series and 16 gallons and Lower raceway series. The two-hour discharge from the Upper Raceway Series would have a calculated concentration of 8.9 mg/L and the lower raceway series 5.8 mg/L. Use in the hatchery building is limited and well below the level used in the raceways. 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. Hydrogen peroxide is a strong oxidizer that breaks down into water and oxygen; however, it exhibits toxicity to aquatic life during the oxidation process. The Regional Board considered the results of acute aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limits for hydrogen peroxide were necessary in this Permit. Results of a single acute toxicity test using *C. dubia* showed a 96-hour NOAEL of 1.3 mg/L. There is no toxicity information available for shorter exposure periods. The DFG Pesticide Unit is proposing to conduct additional toxicity testing on hydrogen peroxide to determine NOAEL

concentrations for shorter exposure periods. Since there is limited short- and long-term toxicity information available at this time and no information regarding actual discharge concentrations of hydrogen peroxide, this permit does not include water quality-based effluent limitations for hydrogen peroxide. However, use and monitoring of hydrogen peroxide 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. 5. The Regional Board will review this information, and other information as it becomes available and this permit may be reopened to establish effluent limits based on additional use and toxicity information.

### ***Potassium Permanganate***

Potassium permanganate (also known by the trade name of Cairox<sup>®</sup>) is used a flush treatment to control external parasites and bacteria. Annual useage of potassium permanganate over the past four years has ranged from a minimum of 4.25 lbs in 2001 to a maximum of 9.2 lbs in 2003. Maximum treatment is 120 grams in the Upper and Lower Raceway Series. The calculated concentration in the discharge is 0.11 mg/L in the Upper Series, and 0.06 mg/L in the Lower Raceway Series. Potassium permanganate may occasionally be used in the brood ponds as well. Potassium permanganate has a low estimated lifetime in the environment, being readily converted by oxidizable materials to insoluble manganese dioxide (MNO<sub>2</sub>). In non-reducing and non-acidic environments, MNO<sub>2</sub> is insoluble and has a very low bioaccumulative potential.

Because potassium permanganate is typically applied in a single, short-term treatment, or as a series of closely-spaced, short-term treatments, the Regional Board considered the results of acute aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limits for potassium permanganate were necessary in this Permit. Results of a single acute toxicity test using *C. dubia* showed a 96-hour NOAEL of 0.25 mg/L for potassium permanganate. There is no toxicity information available for shorter exposure periods. The DFG Pesticide Unit is proposing to conduct additional toxicity testing on potassium permanganate to determine NOAEL concentrations for shorter exposure periods. Since there is limited toxicity information available for short- and long-term exposure and no information regarding actual discharge concentrations of potassium permanganate, this permit does not include water quality-based effluent limitations for potassium permanganate. However, use and monitoring of potassium permanganate 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. 5. The Regional Board will review this information, and other information as it becomes available and this permit may be reopened to establish effluent limits based on additional use and toxicity information.

### ***Chloramine-T***

Chloramine-T is not currently used 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. The Discharger reports that the therapeutic treatment consists of 10-20 mg/L for a 3-hour exposure. 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 were submitted and showed a 96-hour LC<sub>50</sub> for rainbow trout of 2.8 mg/L. The 48-hour NOEC for *Daphnia magna* was reported as 1.8 mg/L. There is no toxicity information available for shorter exposure periods. The DFG Pesticide Unit is proposing to conduct additional toxicity testing on Chloramine-T to determine NOAEL concentrations for shorter exposure periods. Since there is limited toxicity information available for short- and long-term exposure and no information regarding actual discharge concentrations of Chloramine-T, this permit 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. 5. The Regional Board will review this information, and other information as it becomes available and this permit may be reopened to establish effluent limits based on additional use and toxicity information.

### ***PVP Iodine***

PVP Iodine, a solution composed of 10% PVP Iodine Complex and 90% inert ingredients, is used at the Facility as a fish egg disinfectant (fungicide). The Discharger mixes 4 oz. of PVP Iodine in 10 gallons of water and the eggs are dipped into PVP Iodine for 10 minutes. FDA considers PVP iodine an LRP drug for use in aquaculture. The Discharger is not proposing to discharge PVP Iodine to waters of the United States or waters of the State, but plans to use other means of disposal. Consequently, this Order does not include water quality-based effluent limitations for PVP Iodine, but use and means of disposal of this chemical must be reported as specified in the attached Monitoring and Reporting Program. Also, this Order includes a provision requiring 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.

If the Discharger wishes to discharge this chemical to surface waters, results of toxicity tests for PVP Iodine must be submitted as specified in Provision No. 5. 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 these constituents.

### ***MS-222 and AQUI-S®***

The Discharger uses the anesthetic Tricaine methanesulfonate, commonly known as MS-222 (with trade names of Finquel® or Tricaine-S®). MS-222 has been approved by FDA for use as an anesthetic for Salmonidae. MS-222 is used at the Facility for tagging and sorting fish. In the future, the Discharger may use the anesthetic AQUI-S®. AQUI-S® is a water dispersible liquid anesthetic 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. The Discharger is not proposing to discharge these chemicals to waters of the United States or waters of the State, but plans to use other means of disposal. Consequently, this Order does not include water



quality-based effluent limitations for these anesthetics, but use and means of disposal of these chemicals must be reported as specified in the attached Monitoring and Reporting Program. Also, this Order includes a provision requiring 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.

### ***Oxytetracycline***

Oxytetracycline, also known by the brand name Terramycin<sup>®</sup>, is currently used by the Discharger in the hatchery building and becomes part of the Lower Raceway Series discharge. Oxytetracycline, 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 limits for oxytetracycline used in an immersion bath treatment were necessary in this Permit. 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. The information available to the Regional Board regarding discharges of oxytetracycline indicates that it is discharged at levels well below the lowest NOEC and NOAEL. Therefore, at this time, the Regional Board determined that oxytetracycline, when used in feed or 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 Permit 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 permit may be reopened to establish effluent limits based on additional use and toxicity information.

### ***Penicillin G***

Penicillin G is currently used by the Discharger in the hatchery building and becomes part of the Lower Series discharge. Penicillin G is used for the control of bacterial infections; and is administered as a six hour bath. Maximum usage for four tanks would be 600 grams. This amount would yield a discharge of 0.22 mg/L. 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, 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 limits for Penicillin G were necessary in this Permit. 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. The information available to

the Regional Board regarding discharges of Penicillin G indicates that it is discharged at levels well below the lowest NOEC and NOAEL. Therefore, at this time, the Regional Board determined that Penicillin G, when used in an immersion bath treatment, is not discharged from CAAP facilities in the Region 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 Permit does not include effluent limitations 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 permit may be reopened to establish effluent limits based on additional use and toxicity information.

### ***Antibiotics in Feed Formulations and Injected***

Amoxicillin, erythromycin, florfenicol, and Romet-30<sup>®</sup> are not currently used but may potentially be used by the Discharger. Amoxicillin is injected into fish to control acute disease outbreaks through a veterinarian's prescription for extra-label use. Erythromycin (injected or used in feed formulations) and florfenicol (used in feed formulations) are antibiotics used to control acute disease outbreaks and must be used under an INAD exemption or a veterinarian's prescription for extra-label use. Romet-30<sup>®</sup>, also known by the trade name Sulfadimethoxine-oremtroprim, is an antibiotic used in feed formulations and is approved for use in aquaculture through FDA's NADA program for control of furunculosis in salmonids. 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 determined that amoxicillin (when injected into fish), erythromycin (when injected into fish or used as a feed additive), florfenicol and Romet-30<sup>®</sup> (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 Permit. Therefore, the Regional Board determined that amoxicillin, florfenicol, and Romet 30<sup>®</sup> are not discharged from CAAP facilities in the Region 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 Permit does not include water quality-based effluent limitations for these substances; however, this Permit does require monthly monitoring and reporting of these substances as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information and this permit may be reopened to establish effluent limits based on additional use and toxicity information.

### ***Vibrio Vaccine and Enteric Redmouth Bacterin***

To treat enteric redmouth disease, the Discharger administers enteric redmouth bacterin. Enteric redmouth (or yersiniosis) bacterins are formulated from inactivated *Yersinia ruckeri* bacteria and may be used as an immersion or vaccine to help protect salmonid species from enteric redmouth

disease caused by *Yersinia ruckeri*. These bacterins stimulate the fish's immune system to produce protective antibodies. The Discharger has indicated that it may use a vibrio vaccine 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. 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 bacterins, 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.

### **DOMESTIC WASTE DISPOSAL**

Approximately 20 people, consisting of employees and their family members, live on the grounds of Darrah Springs Fish Hatchery. Potable water is supplied from a domestic well. Domestic wastewater from the Facility is discharged to three separate septic tank/leachfield systems as shown on Attachment B. The easterly residences discharge into a septic tank/leachfield system (Leachfield #1). The residences near the Upper Raceway Series discharge into a community septic tank/leachfield system adjacent to the residences (Leachfield #2). Domestic sewage from the office building and hatchery building discharges into a third septic tank/leachfield system (Leachfield #3), which can discharge to a sewage lagoon when necessary during the rainy season.

A sewage lagoon measuring approximately 80 by 40 feet and 15 feet deep was constructed to accommodate excess sewage from Leachfield # 3 (primarily during the rainy season). A barbwire fence with a gate encircles the sewage lagoon. A groundwater monitoring well was installed in 1997 adjacent to the sewage lagoon. Groundwater monitoring for total and fecal coliform is required on a quarterly basis when depth to ground water is less than 5 feet measured from the bottom of the sewage lagoon. A review of the self-monitoring reports shows that the Discharger continues to monitor the sewage lagoon on a quarterly basis and no exceedances of coliform have been detected. Results for total and fecal coliform are less than 2 MPN/100 mL.

### **BASIS FOR 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.

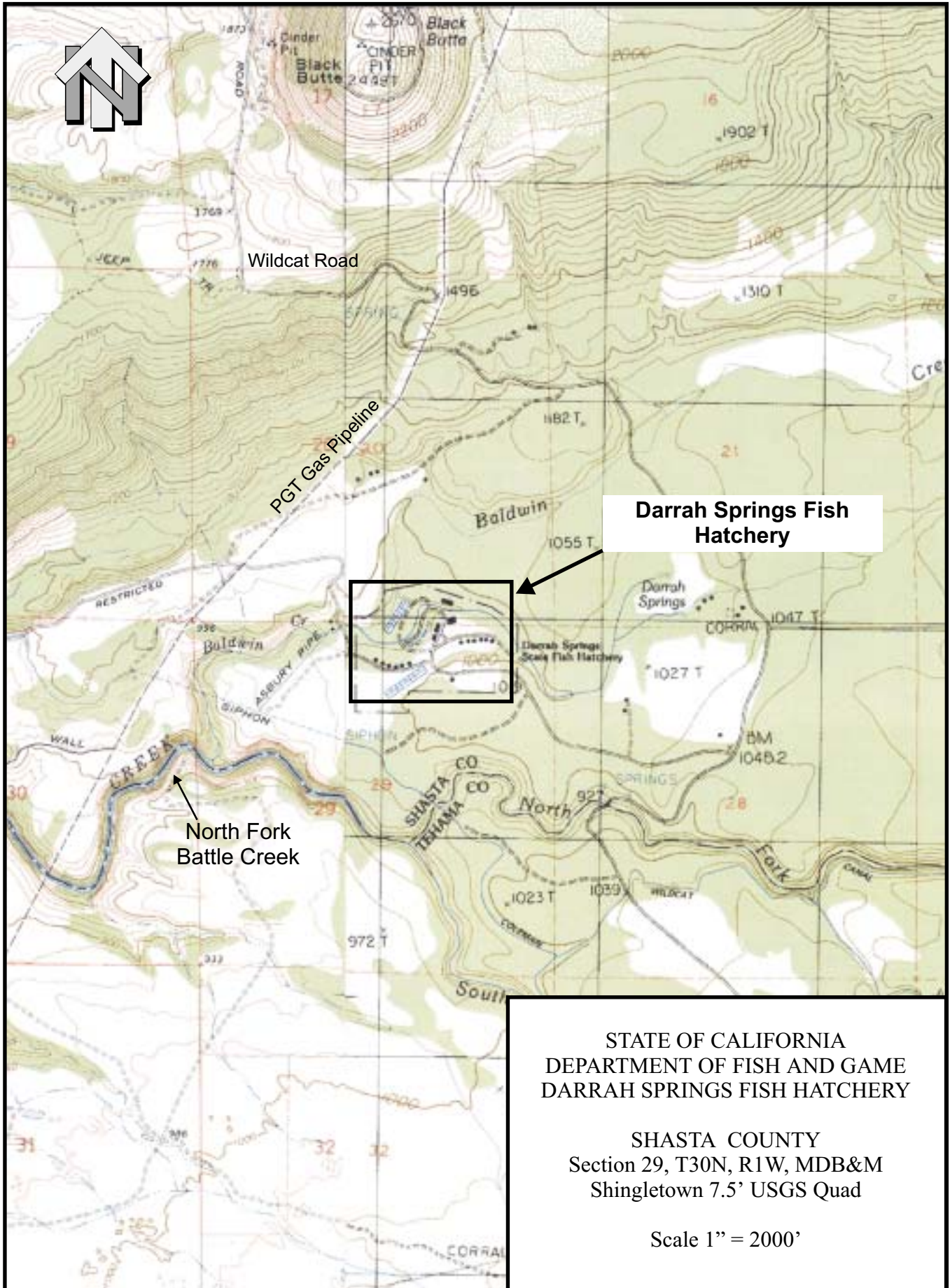
### **BASIS FOR RECEIVING WATER LIMITATIONS**

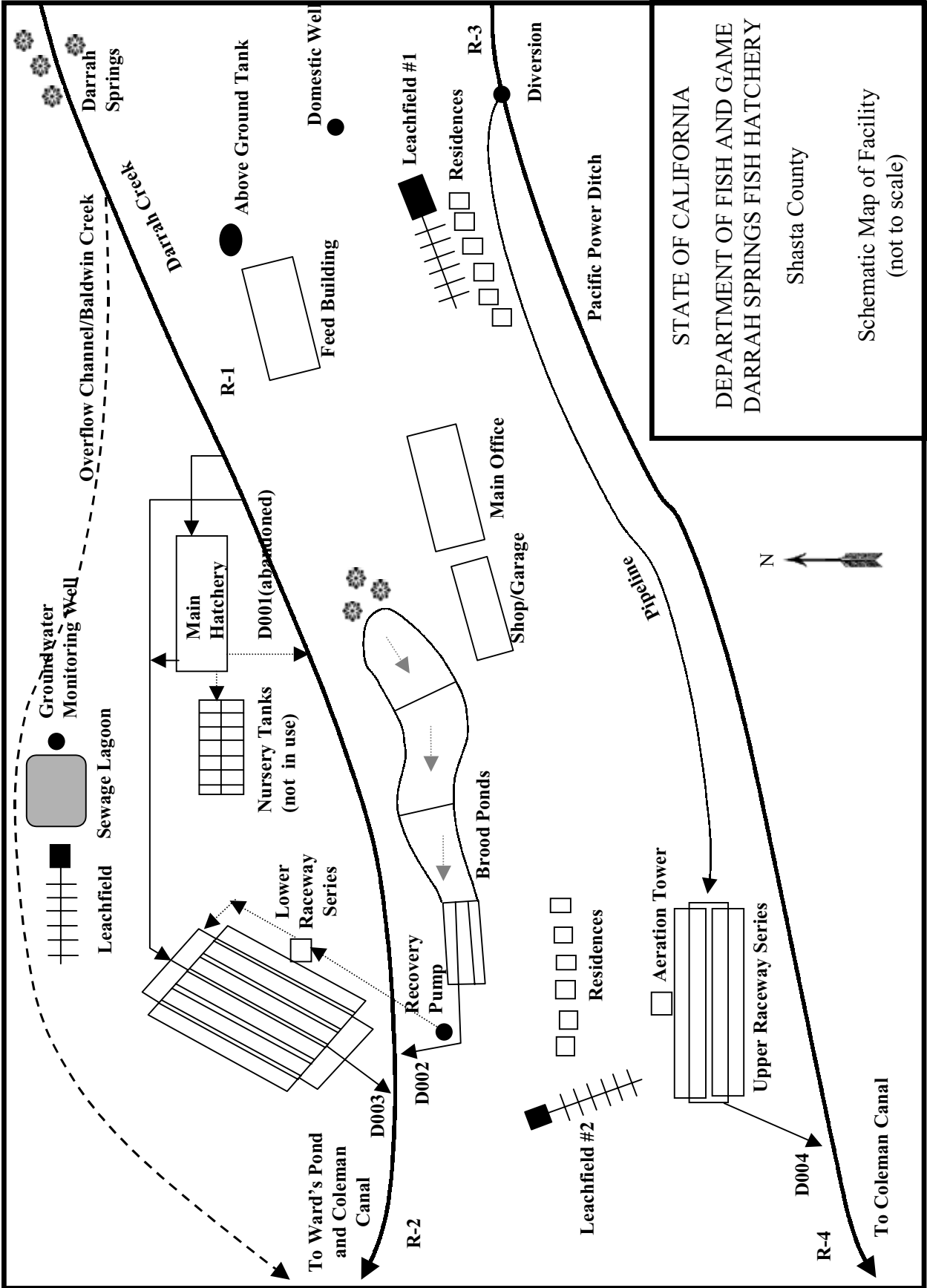
Receiving water limitations are interpretations of water quality objectives from the Basin Plan. Receiving water limitations in this Permit are included to ensure protection of beneficial uses of receiving waters. A receiving water condition not in conformance with a limitation is not necessarily a violation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

### **MONITORING AND REPORTING PROGRAM**

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

MEB: 10 September 2004





**SIP Section 1.4 Maximum Daily Effluent Limitations (MDEL) and Average Monthly Effluent Limitations (AMEL) as Total Recoverable Copper Using Basin Plan Hardness-Dependent Values of the CMC (Acute Criterion) and CTR Hardness-Dependent Values of the CCC (Chronic Criterion)**

Upstream Receiving Water Hardness (mg/L as CaCO <sub>3</sub> )	CMC <sub>Dissolved</sub> 1-hr Average <sup>1</sup> (µg/L)	LTA <sub>acute</sub> <sup>2</sup> (µg/L total recoverable)	CCC <sub>Dissolved</sub> 4-day Average <sup>3</sup> (µg/L)	LTA <sub>chronic</sub> <sup>4</sup> (µg/L total recoverable)	MDEL <sup>5</sup> (µg/L total recoverable)	AMEL <sup>6</sup> (µg/L total recoverable)
<21	Must calculate	Must Calculate	Must calculate	Must calculate	Must calculate	Must calculate
21	3.14	1.05	2.46	1.30	3.3	1.6
22	3.27	1.09	2.56	1.35	3.4	1.7
23	3.41	1.14	2.66	1.40	3.5	1.8
24	3.54	1.18	2.76	1.45	3.7	1.8
25	3.67	1.23	2.85	1.50	3.8	1.9
26	3.81	1.27	2.95	1.56	4.0	2.0
27	3.94	1.32	3.05	1.61	4.1	2.0
28	4.07	1.36	3.14	1.66	4.2	2.1
29	4.20	1.40	3.24	1.71	4.4	2.2
30	4.33	1.45	3.33	1.76	4.5	2.2
31	4.46	1.49	3.43	1.81	4.6	2.3
32	4.59	1.54	3.52	1.86	4.8	2.4
33	4.72	1.58	3.62	1.91	4.9	2.4
34	4.85	1.62	3.71	1.96	5.0	2.5
35	4.98	1.67	3.80	2.00	5.2	2.6
36	5.11	1.71	3.90	2.05	5.3	2.6
37	5.24	1.75	3.99	2.10	5.4	2.7
38	5.37	1.79	4.08	2.15	5.6	2.8
39	5.49	1.84	4.17	2.20	5.7	2.8
40	5.62	1.88	4.26	2.25	5.8	2.9
41	5.75	1.92	4.35	2.29	6.0	3.0
42	5.87	1.96	4.45	2.34	6.1	3.0
43	6.00	2.01	4.54	2.39	6.2	3.1
44	6.13	2.05	4.63	2.44	6.4	3.2
45	6.25	2.09	4.72	2.48	6.5	3.2
46	6.38	2.13	4.80	2.53	6.6	3.3
47	6.50	2.17	4.89	2.58	6.8	3.4
48	6.63	2.22	4.98	2.63	6.9	3.4
49	6.75	2.26	5.07	2.67	7.0	3.5
50	6.88	2.30	5.16	2.72	7.2	3.6
51	7.00	2.34	5.25	2.77	7.3	3.6
52	7.13	2.38	5.34	2.81	7.4	3.7
53	7.25	2.42	5.42	2.86	7.5	3.8
54	7.37	2.47	5.51	2.90	7.7	3.8
55	7.50	2.51	5.60	2.95	7.8	3.9
56	7.62	2.55	5.68	3.00	7.9	3.9
57	7.74	2.59	5.77	3.04	8.1	4.0
58	7.87	2.63	5.86	3.09	8.2	4.1
59	7.99	2.67	5.94	3.13	8.3	4.1
60	8.11	2.71	6.03	3.18	8.4	4.2
65	8.72	2.92	6.46	3.40	9.1	4.5
>65	Must calculate	Must Calculate	Must calculate	Must calculate	Must calculate	Must calculate

<sup>1</sup>  $CMC_{Dissolved} (1\text{-hr average, acute}) = e^{(0.905)(\ln \text{hardness})-1.612}$

<sup>2</sup>  $LTA_{acute, Total Recoverable} = ECA_{acute} \times 0.321$  (where  $ECA_{acute} = CMC_{Dissolved}/0.960$ )

<sup>3</sup>  $CCC_{Dissolved} (4\text{-day average, chronic}) = 0.960 \times e^{(0.8545)(\ln \text{hardness})-1.702}$

<sup>4</sup>  $LTA_{chronic, Total Recoverable} = ECA_{chronic} \times 0.527$  (where  $ECA_{chronic} = CCC_{Dissolved}/0.960$ )

<sup>5</sup>  $MDEL_{Total Recoverable} = \text{Most Stringent LTA} \times 3.11$

<sup>6</sup>  $AMEL_{Total Recoverable} = \text{Most Stringent LTA} \times 1.55$