CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2005-0057

NPDES NO. CA0004774

WASTE DISCHARGE REQUIREMENTS FOR STATE OF CALIFORNIA - DEPARTMENT OF FISH AND GAME NIMBUS SALMON AND STEELHEAD HATCHERY AMERICAN RIVER TROUT HATCHERY SACRAMENTO 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) submitted a Report of Waste Discharge dated 17 July 2002 and applied for a renewal of its permit to discharge under the National Pollutant Discharge Elimination System (NPDES) from the Nimbus Salmon and Steelhead Hatchery (NFH) and the American River Trout Hatchery (ARTH). The Nimbus Salmon and Steelhead Hatchery and the American River Trout Hatchery are co-located and regulated under a single NPDES permit. The NFH and ARTH are hereafter jointly referred to as the Facility. The California Department of Fish and Game (DFG), which operates both hatcheries on property owned by the United States Bureau of Reclamation and DFG, is hereafter referred to as the Discharger.

2. The discharge of treated flow-through process wastewater to the American River was previously regulated by Waste Discharge Requirements (WDRs) Order No. 5-00-268 (NPDES No. CA0004774), adopted by the Regional Board on 8 December 2000.

3. The Facility is located on the south bank of the American River, downstream from Hazel Avenue and Lake Natoma in Rancho Cordova, Sacramento County (T9N, R7E, MDB&M, latitude N 38° 38’ 04” and longitude W 121° 13’ 40”), as shown in Attachment A, a part of this Order.

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

5. The NFH produces juvenile Chinook salmon and steelhead to mitigate for the loss of anadromous fisheries resources due to the operation of Folsom and Nimbus dams. The NFH traps adult fish, collects, incubates, and hatches fish eggs, and rears juvenile fish. The fish are reared for up to a year and trucked to release sites. The fish rearing occurs in concrete raceways utilizing a flow-through, single-pass water system. The NFH consists of a fish ladder for adult salmon and steelhead, four holding ponds for adult fish, a spawning deck for egg removal and fertilization, two hatchery buildings (No. 1 and 2), six 10-ft by 400-ft raceways for rearing, and ancillary operations. The NFH’s current

goal for fish rearing is approximately 430,000 steelhead and 4 million salmon per year. Fish are transferred from the NFH to California water bodies for release.

The ARTH obtains fish eggs or fingerling fish from other hatcheries, or collects fish eggs at remote sites. The eggs are incubated and hatched, and fish are reared to various sizes to accommodate various management strategies. Most of the fish are reared for almost a year to reach "catchable size" (1/2 pound). The ARTH receives fertilized trout eggs for hatching and raises fish in one hatchery building, four 10-ft by 200-ft nursery ponds, and ten 10-ft by 600-ft raceways. A small number of inland salmon are also raised at the ARTH. A fish disease control laboratory is located at the ARTH. The ARTH's current goal for fish rearing is approximately one million fish per year. Fish are transferred from the ARTH to several California water bodies for release.

In its Report of Waste Discharge, the Discharger reported the following total yearly harvestable weights: 600,000 lbs of trout, 70,000 lbs of salmon, and 130,000 lbs of steelhead. The Discharger also reported that 90,000 lbs of food fed during the month of maximum feeding (May).

6. The NFH and the ARTH receive water from Lake Natoma, upstream from Nimbus Dam, via a common 60-inch line. Lake Natoma is part of the American River system which flows from the Sierra Nevada mountain range to Folsom Lake, through Lake Natoma, to the Sacramento River. Combined water intake for both hatcheries was reported by the Discharger as approximately 39 to 45 million gallons per day (mgd), and, as stated in the previous Order, can be as high as 90 mgd. Intake flow is controlled by the Discharger and is adjusted to meet operational needs (e.g., intake flow is reduced when the raceways are cleaned). The hatcheries also receive minor flow from Lake Natoma via an older 42-inch line (estimated to be less than 4.2 mgd). Flow through the 42-inch line is maintained to prevent water in the line from becoming stagnant. All water is used on a once-through basis, and is discharged to the American River through four outfalls (001, 002, 003, and 004).

7. Outfall 004 is an overflow point from two parallel settling ponds. The Facility includes two parallel settling ponds for the disposal of wastewater from raceways and rearing ponds during normal cleaning operations, and from the incubator building, the fish disease lab, and local surface drainage. The settling ponds were constructed in highly permeable gravels, which allow the entire flow to indirectly discharge to the American River through seepage. The settling ponds were also constructed with overflow points to a 12-inch pipe that discharges directly to the American River (Outfall 004). Total flow to these ponds varies from approximately 20 to 40 mgd. Because of rapid infiltration within the ponds, the Discharge reports that the ponds have not overflowed and discharged via Outfall 004 directly to the American River for at least the last six years.

8. Wastewater is discharged from the Facility at four outfalls as shown by Attachment B, a

part of this Order, and described as follows:

Outfall 001 – Overflow from the NFH holding ponds and fresh water, if needed, comprise the water discharged from the NFH fish ladder to the American River through Outfall 001. Discharge from Outfall 001 is seasonal, with flow typically from November to April when the fish ladder is open. The Discharger has estimated the flow from Outfall 001 to be 19 mgd.

Outfall 002 – Wastewaters from the NFH hatchery buildings (water used for egg incubation and hatching) and the NFH spawning deck (water used during egg removal) are discharged to the American River through Outfall 002. The Discharger has estimated Outfall 002 flow to be 3 mgd.

Outfall 003 – Outfall 003 consists solely of wastewater from the ARTH rearing ponds (raceways). Approximately 50% of the ARTH rearing ponds flow during normal operations is directly discharged to the American River through Outfall 003. All flow from the ARTH raceways is diverted to the settling ponds when the raceways are being cleaned or when treatment chemicals are added. The estimated flow from Outfall 003 is 18 mgd.

Outfall 004 – Outfall 004 discharges to the American River any overflow from the two settling ponds at the Facility. Overflow and discharge via Outfall 004 directly to the American River has not occurred for at least the last six years. The settling ponds receive wastewaters from the following sources: 50% of the flow from the ARTH rearing ponds (the other 50% of flow from the ARTH rearing ponds is discharged through Outfall 003, as described previously), all the wastewater flows from the NFH hatchery raceways, the ARTH hatchery building, the ARTH nursery ponds, and the ARTH fish disease laboratory. Because the ponds are permeable and discharge to the American River via seepage, the Discharger reports it has not discharged from Outfall 004 for at least six years.

9. Water used for cleaning lab glassware is discharged to a closed system at the Fish and Wildlife Pollution Control Laboratory, which is under separate requirements of another Waste Discharge Requirements Order. Such wastewater is disinfected and sent to a lined evaporation waste pond that has no discharge to surface or ground waters.

10. According to monthly self-monitoring and laboratory reports submitted by the Facility between March 2000 and September 2003, influent water quality had the following characteristics:

Constituent	Units	Min	Max	Avg *
Total Suspended Solids (TSS)	mg/L	< 1.0	6.2	1.9
Settleable Solids	ml/L	0**	0**	0**

Constituent	Units	Min	Max	Avg *
pH	standard units	6.6	8.0	--
Total Dissolved Solids (TDS)	mg/L	24	117	45
Turbidity	NTUs	0.51	3.5	1.2
Dissolved Oxygen	mg/L	5.3	12.2	9.3
Conductivity	µmhos/cm	39	218	62

* Average of quantifiable values only
** Settleable solids reported as "0" rather than < Reportable Level

11. Based on data from monthly self-monitoring and laboratory reports submitted by the Facility between March 2000 and September 2003, the following effluent characteristics describe the discharge from Outfall 001:

Constituent	Units	Min	Max	Avg *
TSS	mg/L	< 1.0	7.1	2.9
Settleable Solids	ml/L	0**	0**	0**
pH	standard units	6.9	7.9	--
TDS	mg/L	23	82	43.9
Turbidity	NTUs	0.66	5.5	2.1
Dissolved Oxygen	mg/L	7.8	11.6	10.6
Conductivity	µmhos/cm	48	88	65.0

* Average of quantifiable values only
** Settleable solids reported as "0" rather than < Reportable Level

12. Based on data from monthly self-monitoring and laboratory reports submitted by the Facility between March 2000 and September 2003, the following effluent characteristics describe the discharge from Outfall 002:

Constituent	Units	Min	Max	Avg *
TSS	mg/L	< 1.0	10	2.6
Settleable Solids	ml/L	0**	0**	0**
pH	standard units	6.9	8	--
TDS	mg/L	20	98	43.1
Turbidity	NTUs	0.52	4.8	1.6
Dissolved Oxygen	mg/L	7.3	12.1	9.9
Conductivity	µmhos/cm	44	88	63.3

* Average of quantifiable values only
** Settleable solids reported as "0" rather than < Reportable Level

13. Based on data from monthly self-monitoring and laboratory reports submitted by the Facility between March 2000 and September 2003, the following effluent characteristics describe the discharge from Outfall 003:

Constituent	Units	Min	Max	Avg *
TSS	mg/L	< 1.0	7.4	3.4
Settleable Solids	ml/L	0**	0**	0**
pH	standard units	6.6	7.8	--
TDS	mg/L	16	100	45.0
Turbidity	NTUs	0.67	7.2	1.5
Dissolved Oxygen	mg/L	5.8	9.8	7.8
Conductivity	µmhos/cm	39	90	62.0

* Average of quantifiable values only

** Settleable solids reported as "0" rather than < Reportable Level

14. Outfall 005: As described previously, the Discharger reports it has not discharged from Outfall 004 (overflow from the settling ponds) for at least six years. To ensure adequate characterization of wastewater from the Facility during drug and chemical treatment and the potential effects of percolation from the settling ponds to surface waters, this Order requires monitoring of wastewater discharged to the settling ponds (new Outfall 005) and monitoring of the American River downstream of the settling ponds, as required by the previous Order. No numeric discharge specifications are applied to Outfall 005.

15. 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.

16. 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. Since May 2000, the Discharger has reported the use of the following drugs and chemicals at the Facility: copper sulfate, formalin (as a 37% formaldehyde, methanol-free solution), sodium chloride (salt), hydrogen peroxide, potassium permanganate, oxytetracycline (Terramycin®) as a feed additive, and penicillin G.

    The Discharger indicated in its Report of Waste Discharge and confirmed in a subsequent communication with the Regional Board, dated 23 April 2004, the potential use of the following additional aquaculture drugs and chemicals in the future: acetic acid, calcium chloride, P.V.P. iodine/iodophor, chloramine-T, tricaine methanesulfonate (MS-222), Aqui-S®, soluble oxytetracycline, Romet-30® (sulfadimethoxine-ormetoprim), florfenicol, carbon dioxide, sodium bicarbonate, amoxycillin, erythromycin, vibrio vaccine, and enteric redmouth bacertin.

17. All domestic wastewater is discharged to an on-site septic system, which is regulated by the County of Sacramento.

18. Three species chronic toxicity monitoring was required on a quarterly basis in the previous Order. Two sets of chronic toxicity test results were submitted by the Discharger. One set was for samples taken in January 2001 and analyzed for whole effluent toxicity using *Ceriodaphnia dubia* as the test species. The second set of data was for samples taken in March 2002 and analyzed for whole effluent toxicity using *Ceriodaphnia dubia*, *Pimephales promelas*, and *Selanastrum capricornutum*. There were no statistically significant differences in survival of *Ceriodaphnia dubia* or *Pimephales promelas* between various dilutions of effluent (up to 100% effluent) and a control sample with the exception of one dilution (a mixture of 87.5% receiving water and 12.5% effluent) for the March 2002 sample and the test species *Pimephales promelas*. Furthermore, for the same samples, only one test (again, a mixture of 87.5% receiving water, 12.5 % effluent) showed statistically significant difference in growth of *Pimephales promelas* and reproduction of *Ceriodaphnia dubia* versus the control sample. There was no statistically significant difference in growth of *Selanastrum capricornutum* for any of the dilutions tested. The Discharger has conducted and continues to conduct special toxicity studies to determine the effects of the maximum possible concentration of therapeutic drugs administered at hatcheries. Some provisions of this Order are, in part, based on the results of the completed studies. Based on the chronic toxicity tests and the completed and ongoing studies of aquaculture drugs conducted by the Discharger, the requirement for chronic toxicity monitoring is being removed in this Order. This Order addresses the narrative toxicity objective from the Basin Plan by considering aquaculture drugs and chemicals individually.

APPLICABLE LAWS, REGULATIONS, POLICIES, AND PLANS

19. 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.

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

21. 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 sometimes used to anesthetize fish prior to spawning or "tagging" processes. 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.

22. USEPA has 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.

23. The Regional Board adopted a *Water Quality Control Plan*, *Fourth Edition, for the Sacramento and San Joaquin River Basins* (hereafter Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and describes an implementation program and policies to achieve water quality objectives for all waters of the Basin. This includes plans and policies adopted by the State Water Resources Control Board (SWRCB) and incorporated by reference, such as Resolution No. 68-16,

"Statement of Policy with Respect to Maintaining High Quality of Waters in California" (Resolution No. 68-16). These requirements implement the Basin Plan. The Basin Plan, as amended, designate beneficial uses, establish water quality objectives, and contain implementation plans and policies for waters of the Basins. Pursuant to the California Water Code §13263(a), waste discharge requirements must implement the Basin Plan.

24. 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.

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

26. Section 303 (d) of the CWA requires states to identify waters for which implementation of technology-based effluent limitations have not been stringent enough to attain water quality standards for those waters. On 25 July 2003 the USEPA approved the State's updated list of 303 (d) impaired waters, which lists the Lower American River between Nimbus Dam and the Sacramento River as impaired for mercury, with the potential sources identified as abandoned mines, and unknown toxicity.

BENEFICIAL USES

27. The existing beneficial uses of the American River from Folsom Dam to the Sacramento River, as identified in Table II-1 of the Basin Plan, are municipal and domestic supply (MUN); irrigation (AGR); industrial service and power supply (IND, and POW); water contact recreation (including canoeing and rafting) (REC-1); non-contact water

recreation (REC-2); warm and cold freshwater habitat (WARM and COLD); warm and cold water fish migration habitat (MIGR); warm and cold water spawning habitat (SPWN); and wildlife habitat (WILD).

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

REASONABLE POTENTIAL AND EFFLUENT LIMITATIONS

29. 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

30. USEPA's final ELG for the aquaculture industry does not include numeric effluent limitations on any conventional, non-conventional, or toxic constituents. Rather, USEPA promulgated qualitative limitations in the form of BMP requirements. Technology-based requirements in this Order are based on a combination of application of the ELG for BMP requirements and case-by-case numeric limitations developed using best professional judgment (BPJ) and carried over from the previous Order. Section 402(o) of the CWA prohibits backsliding of effluent limitations that are based on BPJ to reflect a subsequently promulgated ELG that is less stringent. Order No. 5-00-268 (a revised Order) established effluent limitations for TSS of 5.0 mg/L net over levels in influent and 15 mg/L net as a monthly average and daily maximum, respectively, based on BPJ. In addition, the Order established effluent limitations for settleable solids of 0.1 ml/L net and 0.2 ml/L net as a monthly average and daily maximum, respectively, based on BPJ. Results of monitoring indicate the Discharger is capable of meeting these limitations. Removal of these numeric limitations for TSS and settleable solids would constitute backsliding under CWA Section 402(o). The Regional Board has determined that these numeric effluent limitations for TSS and settleable solids continue to be applicable to the Facility and that backsliding is not appropriate. These limitations are established as a means of controlling the discharge of solids from algae, silt, fish feces and uneaten feed. 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 (WQBEL's)

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

32. 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).

33. On September 2001, the Executive Officer of the Regional Board issued a letter pursuant to Section 13267 of the California Water Code (CWC) requiring all NPDES Dischargers to conduct effluent and receiving water monitoring and submit results of this monitoring in accordance with a time schedule provided in the letter. The Discharger conducted a study to determine whether levels of NTR, CTR, or other pollutants in the discharge have the reasonable potential to cause or contribute to an in-stream excursion above a numeric or narrative water quality standard, including Basin Plan numeric or narrative objectives and CTR/NTR criteria. Results of this study were submitted to the Regional Board for samples taken on 9 April 2002 and 9 September 2003. The effluent samples were proportionally composited from grab samples taken from the intake water (to represent Outfall 001), Outfall 002, Outfall 003, and the discharge to the settling ponds (to represent Outfall 004. Some constituents monitored in this study were not detected at concentrations equal to or greater than appropriate analytical technique Minimum Levels (ML's) specified by Appendix 4 of the SIP. Where an approved laboratory analytical method and associated ML could not, at this time, determine whether an analyte is present in the discharge above the applicable criteria, a Provision of this Order requires resampling for the constituent if new ML's are adopted by the SWRCB.

34. Section 1.3 of the SIP requires that the Regional Board impose water quality-based effluent limitations for a priority pollutant if (1) the maximum effluent concentration (MEC) is greater than the most stringent CTR criterion or applicable site-specific Basin Plan objective, or (2) the ambient background concentration is greater than the CTR

criterion or applicable site-specific Basin Plan objective, or (3) other information is available to determine that a water quality-based effluent limitation is necessary to protect beneficial uses.

35. Based on effluent and receiving water study data submitted by the Discharger, routine effluent and receiving water monitoring, information from the Discharger regarding use of aquaculture drugs and chemicals, and DFG toxicity studies for aquaculture drugs and chemicals, the discharge has the reasonable potential to cause or contribute to an in-stream excursion above narrative or numeric water quality criteria or objectives for copper, pH, and formaldehyde. As required by 40 CFR Part 122.44 (d)(1)(i)-(iii), this Order includes water quality based effluent limitations for copper, pH, and formaldehyde. In addition, this Order carries over from the previous Order effluent limitations for dissolved oxygen (DO), turbidity, and total dissolved solids (TDS) based on water quality objectives from the Basin Plan.

36. In situations where receiving water flows are substantially greater than effluent flows, dilution may be considered in establishing effluent limitations. However, when a receiving water is impaired by a particular pollutant or stressor, limited or no pollutant assimilative capacity may be available in spite of the available dilution. Additionally, water quality based effluent limitations may be established considering acute wasteload allocations and the need to prevent acutely toxic conditions at the point of discharge. In these instances, and depending upon the nature of the pollutant, effluent limitations may be set equal to or less than the applicable water quality criteria or objectives that are applied at the point of discharge such that the discharge will not cause or contribute to a receiving water excursion above water quality objectives established to protect the beneficial uses. The copper and formaldehyde effluent limitations are based upon protection of aquatic life from acute effects. Therefore, it is appropriate to calculate effluent limitations with no dilution allowance.

CTR Constituents

Copper

37. Copper, primarily in the forms of copper sulfate and chelated copper compounds, is used in fish hatcheries to control algae and other vegetation that is susceptible to the toxic effects of copper uptake, and it is used to control the growth of external parasites and bacteria on fish. Copper sulfate may be used at the Facility in the future at a rate of up to 0.5 pounds copper sulfate per 1 cfs in raceways. Lack of accurate flow measurements for the raceways precludes meaningful estimates of potential concentrations of copper in the discharge to or from the settling ponds. Copper concentration in the composited discharge from the Facility was 1.3 µg/L, but this sample represents the combined discharge from all outfalls and was not taken during copper treatments. Estimated potential discharge copper concentrations during copper treatments from other DFG

facilities (Mt. Shasta, Mokelumne, Merced) range from 58 to 200 µg/L.

38. Copper is identified as a priority pollutant in the NTR and CTR. The CTR includes Ambient Water Quality Criteria for the Protection of Aquatic Life for copper. The Criterion Maximum Concentration (CMC), a 1-hour average, and Criterion Continuous Concentration (CCC), a 4-day average, are hardness dependent. The criteria are expressed in terms of the dissolved fraction of the metal in the water column and are calculated from the total recoverable values by applying a conversion factor. The conversion factor in the CTR is 0.96 for both acute (CMC) and chronic (CCC) criteria. Water quality criteria for copper for the protection of aquatic life, as established by the CTR are 3.4 µg/L (acute) and 2.6 µg/L (chronic) criteria for dissolved copper (3.5 and 2.7 µg/L total recoverable) at 23 mg/L hardness, which is the minimum effluent and receiving water hardness reported with the Facility's CTR monitoring. The site-specific copper criterion (acute) from the Basin Plan for the Lower American River (between Folsom Dam and the Sacramento River) is 10.4 µg/L (total recoverable). Based on DFG's estimates of potential application rates, and estimated potential copper discharge concentrations from other DFG facilities, there is reasonable potential for copper to be present in the discharge at levels exceeding water quality criteria or objectives for the protection of aquatic life from the CTR and the Basin Plan. Accordingly, this Order includes WQBELs for copper.

39. Effluent limitations for copper must be expressed as a total recoverable concentration. Since a site-specific translator has not been developed for copper as described in the SIP Section 1.4.1, the USEPA conversion factor for copper of 0.960 was used for translating the dissolved copper criterion into a total recoverable effluent concentration allowance (ECA) with no dilution. Accordingly, both an Average Monthly Effluent Limitation (AMEL) and Maximum Daily Effluent Limitation (MDEL) for copper are established in this Order based on the CTR criteria and the site-specific criterion from the Basin Plan and procedures outlined in the SIP, as shown in Attachment C.

40. Although the effluent limitations for copper are new requirements in this Order, the Discharger has not reported using used copper sulfate at the facility in recent years and, therefore, should be able to manage use of copper sulfate to comply with the new effluent limitations. This Order does not establish a compliance schedule for copper limitations, but requires compliance with final effluent limitations for copper immediately.

Mercury

41. The Lower American River between Nimbus Dam and the Sacramento River is impaired by mercury. Mercury is identified as a priority pollutant in the NTR and CTR. The CTR includes the Ambient Water Quality Criterion for the Protection of Human Health (for consumption of water and organisms) of 0.050 µg/L for mercury. The Discharger collected two effluent and two receiving water samples for mercury. Mercury was

detected in the Facility's effluent at concentrations of 0.00115 µg/L and 0.0781 µg/L. Mercury concentrations in the receiving water were reported as 0.00081 and 0.00143 µg/L. The maximum effluent concentration of mercury exceeds the CTR criterion. However, the there are no known processes or materials which the Discharger uses as a result of hatchery operation that contain or contribute mercury to the final effluent. For this Facility, intake water is from the same water body as the receiving water body. In accordance with Section 1.4.4 of the SIP, the Regional Board may consider priority pollutants in intake water on a pollutant-by-pollutant and discharge-by-discharge basis when establishing water quality based effluent limitations provided certain conditions are met. The current data are insufficient to determine whether effluent concentrations of mercury are a result of spatial or temporal changes in mercury concentrations of the influent supply water, or may be influenced by groundwater accretions within the settling ponds. Therefore, this Order requires the Discharge to conduct a study of influent, effluent, and receiving water mercury concentrations to determine whether mercury is discharged from the facility at levels that cause, have the reasonable potential to cause, or contribute to an excursion of applicable water quality standards. Based upon the results of this study, this Order may be reopened to include final effluent limitations for mercury based upon the CTR criterion, a load allocation from the TMDL, or, limitations which reflect intake water credits in accordance with Section 1.4.4 of the SIP if applicable.

Non-CTR Constituents

42. The Basin Plan contains water quality objectives for pH in the form of a range of acceptable pH values (measured in standard units). In the previous Order, the Regional Board established effluent limitations in the form of an acceptable range of pH between 6.5 and 8.5 standard units for discharges to the American River. This existing pH limitation is carried over to this Order with the addition, however, that an effluent pH outside of this range is acceptable only where influent pH measured at the same time also is outside the range. In such cases, effluent pH may be outside the acceptable range, but only to the same extent that influent pH is outside of this range. This limitation will control the discharge of drugs or chemicals (e.g., acetic acid) that may alter the pH of the effluent. Based on recent self-monitoring reports, the discharge has remained within the acceptable range.

43. The Basin Plan contains water quality objectives for dissolved oxygen (DO) concentrations not to be reduced below minimum levels (measured in mg/L). For waters designated COLD and SPWN, the Basin Plan specifies that the DO concentrations shall not be reduced below 7.0 mg/L at any time. In the previous Order, the Regional Board established effluent limitations requiring a minimum DO concentration of 7 mg/L for discharges to the American River. Based on self-monitoring reports, the discharge and receiving water DO concentrations have periodically fallen below 7.0 mg/L. The existing DO limitation is carried over to this Order with the addition, however, that an effluent DO below 7.0 mg/L is acceptable only where influent DO measured at the same

time also is outside the range and there is no reduction in DO from the influent to the effluent.

44. The Basin Plan contains turbidity water quality objectives for the American River from Folsom Dam to the Sacramento River. Except for periods of storm runoff, the Basin Plan specifies that the turbidity shall be less than or equal to 10 NTUs. The previous Order included an effluent limitation for turbidity of 10 NTUs as a maximum daily limitation. To ensure continued compliance with the water quality objective from the Basin Plan, this effluent limitation is retained in this Order.

45. A 37 percent formaldehyde solution (formalin) is periodically used at hatcheries as a fungicide treatment on fish eggs and fish in the raceways. Although the Discharger has not used formalin on a routine basis, it has requested the ability to use formalin in the future. Formalin (also known by the trade names Formalin-F®, Paracide-F®, PARASITE-S®) is approved through FDA's New Animal Drug Application (NADA) program for use in controlling external protozoa and monogenetic trematodes on fish, and for controlling fungi of the family *Saprolegniacae* in food-producing aquatic species (including trout and salmon). For control of other fungi, formalin may be used under an Investigational New Animal Drug (INAD) exemption. Formalin typically is used as a "drip" treatment to control fungus on fish eggs at a concentration of 1,000 to 2,000 ppm for 15 minutes, or as a "flush" treatment in raceways of 1-8 hours in duration at a concentration of 170 to 250 ppm for 1-hour or, based on DFG use assumptions, at 25 ppm for 8-hours. Lack of accurate flow measurements for the raceways precludes meaningful estimates of formaldehyde concentrations in the discharge to the settling ponds. Monitoring reports from May 2000 through September 2003 indicate no detected concentrations of formaldehyde in the discharges from Outfall 001, Outfall 002, or Outfall 003. However, in May 2000, the Discharger sampled the settling ponds and receiving water for formaldehyde and found that the settling ponds contained formaldehyde at a concentration of 1.4 mg/L and a sample from the American River 100 feet downstream of the settling ponds contained formaldehyde at a concentration of 0.55 mg/L. The Discharger indicated that it believed the problem leading to these high levels of formaldehyde was related to malfunctioning of the pump that meters out formalin at a specific rate for treatment.

The DFG Pesticide Unit conducted biotoxicity studies to determine the aquatic toxicity of formalin using *Pimephales promelas* and *Ceriodaphnia dubia* in accordance with the analytical methods specified in 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 *Ceriodaphnia 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 $LC_{50.}$ 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 limitations for formalin as formaldehyde were necessary.

Results of chronic toxicity tests indicated *Ceriodaphnia dubia* was the most sensitive species, with a 7-day NOEC value of 1.3 mg/L formaldehyde for survival and < 1.3 mg/L for reproduction (the Regional Board used an NOEC of 1.3 mg/L). Acute toxicity tests conducted using *Ceriodaphnia dubia* showed a 96-hour NOAEL of 1.3 mg/L formaldehyde. Additional acute toxicity tests were conducted using only an 8-hour exposure, resulting in a 96-hour NOAEL concentration of 6.7 mg/L formaldehyde. Based on the results of these toxicity tests, past discharges of formaldehyde from the facility, and the potential for future discharges of formaldehyde from the 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. Effluent concentrations of formaldehyde may persist because of potential application procedures (e.g., successive raceway treatments, drip treatments for eggs) and due to retention of effluent in the settling basins. Accordingly, this Order includes both maximum daily and average monthly water quality-based effluent limitations for formaldehyde.

Order No. 5-00-268 included a maximum daily limitation of 0.03 mg/L for formaldehyde based on a previous California Department of Health Services (DHS) Action Level for Drinking Water. There is no USEPA or California MCL for formaldehyde. Based on the new information from DFG toxicity tests, the lack of an MCL to adequately interpret chemical objectives from the Basin Plan, and to maintain consistency with permit requirements for similar CAAP facilities in the Region, the Regional Board has determined that it is appropriate to revise the formaldehyde limitations in this Order. As shown in the Information Sheet, both an average monthly effluent limitation of 0.65 mg/L and a maximum daily effluent limitation of 1.3 mg/L were calculated based on the 96-hour NOAEL value and using the procedure in USEPA's TSD for calculating water quality-based effluent limitations. These effluent limitations are included in this Order and have been established for protection of aquatic life against toxic effects from exposure to formaldehyde in the discharge. This change in effluent limitations is consistent with the Federal anti-backsliding provisions of 40 CFR 122.44(l)(1) and 122.62(a)(2).

46. The Discharger's monthly monitoring reports indicate that sodium chloride (salt) is used on a routine basis. DFG reports that a typical application rate for salt of up to 400 lbs per 3-hour flush treatment in raceway as a fish-cleansing agent to control the spread of fish disease and to reduce stress among the confined fish population. Sodium chloride may

also used in the hatchery building tanks. In the past, the Discharger has used calcium chloride at the Facility. Calcium chloride is used to increase water calcium concentration to ensure proper egg hardening. FDA considers sodium chloride and calcium chloride as unapproved new animal drugs 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. Lack of accurate flow measurements precludes meaningful estimates of sodium chloride or calcium chloride concentrations in the discharge. However, the previous Order included effluent limitations of 125 mg/L for TDS as a daily maximum, based on the site-specific salinity objective from the Basin Plan, and 100 µmhos/cm for conductivity as a 14-day average. The Discharger has monitored effluent from Outfalls 001, 002, and 003 and the receiving water for conductivity and total dissolved solids. Conductivity levels (maximum ranging from 88-100 µmhos/cm) and concentrations of TDS (maximum ranging from 82-102 mg/L) are low in both the effluent and receiving water downstream of the settling ponds. However, because there is no indication that measurements of TDS and conductivity were taken for samples collected during treatment with sodium chloride or calcium chloride at the Facility, the effluent limitation for TDS is retained in this Order. The 14-day average limit for conductivity is removed from this Order. This conductivity limitation in the previous Order was not based on a site-specific water quality objective from the Basin Plan. An appropriate interpretation of the narrative objective for chemical constituents for conductivity is a limit of 700 µmhos/cm to protect agricultural beneficial uses of the American River, as described in the Information Sheet. Furthermore, TDS concentration and conductivity levels are related. Controlling TDS in the discharge will control the conductivity level. Finally, this change is consistent with the Federal anti-backsliding provisions of 40 CFR 122.44(l) and 122.62(a). Effluent and receiving water monitoring of both conductivity and TDS is still required, and monthly use of sodium chloride and calcium chloride must be reported as specified in the Monitoring and Reporting Program.

47. Hydrogen peroxide (35 % H_2O_2) is used periodically at the Facility. Hydrogen peroxide may be used as a short-term immersion bath treatment in holding tanks, or as a raceway flush treatment. FDA considers hydrogen peroxide to be an LRP drug when used to control fungi on fish at all life stages, including eggs. Hydrogen peroxide may also be used under an INAD exemption to control bacterial gill disease in various fish, fungal infections, external bacterial infections, and external parasites. Hydrogen peroxide is a strong oxidizer that breaks down into water and oxygen; however, it exhibits toxicity to aquatic life during the oxidation process. Results of a single acute toxicity test conducted by DFG using *C. dubia* showed a 96-hour NOAEL of 1.3 mg/L. Since there is limited toxicity information available at this time and no information regarding actual discharge concentrations of hydrogen peroxide, this Order does not include 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. 4.

The Regional Board will review this information, and other information as it becomes available and this Order may be reopened to establish effluent limitations for hydrogen peroxide based on additional use and toxicity information.

48. Potassium permanganate (also known by the trade name of Cairox^{TM}) has been used periodically at the Facility to control gill disease. Potassium permanganate has a low estimated lifetime in the environment, being readily converted by oxidizable materials to insoluble manganese dioxide (MNO_2). In non-reducing and non-acidic environments, MNO_2 is insoluble and has a very low bioaccumulative potential. Potassium permanganate is not approved for use in aquaculture under FDA's NADA program and should therefore be used in accordance with an INAD exemption granted by FDA. Results of a single acute toxicity test using *C. dubia* conducted by DFG showed a 96-hour NOAEL of 0.25 mg/L for potassium permanganate. Since there is limited toxicity information available at this time and no information regarding actual discharge concentrations of potassium permanganate, this Order does not include 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. 4. The Regional Board will review this information, and other information as it becomes available and this Order may be reopened to establish effluent limitations based on additional use and toxicity information.

49. PVP Iodine, a solution composed of 10% PVP iodine complex and 90% inert ingredients, may be used at the Facility in the future as a fish egg disinfectant (fungicide). FDA considers PVP iodine an LRP drug for use in aquaculture. Results of a single acute toxicity test with *Ceriodaphnia dubia* showed a 96-hour NOAEL of 0.86 mg/L. Since there is limited toxicity information available at this time and no information regarding actual discharge concentrations of PVP iodine, this Order does not include water quality-based effluent limitations for PVP iodine. However, use and monitoring of PVP iodine 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. 4. 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 PVP iodine based on additional use and toxicity information.

50. Chloramine-T is not currently used but may be used by the Discharger in the future as a possible replacement for formalin. Chloramine-T is available for use in accordance with an INAD exemption by FDA. Chloramine-T breaks down into para-toluenesulfonamide (p-TSA) and, unlike other chlorine-based disinfectants, does not form harmful chlorinated compounds. The Regional Board does not have estimates of discharge concentrations of chloramine-T at this Facility. The Discharger has not conducted biotoxicity tests using chloramine-T, however results of toxicity testing from other sources show a 96-hour LC_{50} for rainbow trout of 2.8 mg/L. The 48-hour NOEC for

Daphnia magna was reported as 1.8 mg/L. The DFG Pesticide Unit is proposing to conduct additional toxicity testing on chloramine-T to determine NOAEL concentrations. Since there is limited toxicity information available and no information regarding actual discharge concentrations of chloramine-T, this Order does not include water quality-based effluent limitations for chloramine-T. However, use and monitoring of chloramine-T must be reported as specified in the attached Monitoring and Reporting Program and results of additional toxicity tests must be submitted as specified in Provision No. 4. The Regional Board will review this information, and other information as it becomes available and this Order may be reopened to establish effluent limitations based on additional use and toxicity information.

51. In the future, the Discharger may use the anesthetics tricaine methanesulfonate, commonly known as MS-222 (with trade names of Finquel® or Tricaine-S®) and Aqui-S®. MS-222 has been approved by FDA for use as an anesthetic for Salmonidae. It is intended for the temporary immobilization of fish, amphibians and other aquatic, cold-blooded animals. It has been recognized as a valuable tool for the proper handling of these animals during manual spawning (fish stripping), weighing, measuring, marking, surgical operations, transport, photography, and research. MS-222 is a crystalline powder used as an immersion bath in an enclosed tub. 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. Since there is limited toxicity information available at this time and no information regarding actual discharge concentrations of MS-222 or Aqui-S®, this Order does not include water quality-based effluent limitations for MS-222 or Aqui-S®. However, use and monitoring of MS-222 and Aqui-S® must be reported as specified in the attached Monitoring and Reporting Program and results of additional toxicity tests must be submitted as specified in Provision No. 4. The Regional Board will review this information, and other information as it becomes available and this Order may be reopened to establish effluent limitations based on additional use and toxicity information.

52. The hatchery may periodically use the antibiotics oxytetracycline and penicillin G as therapeutic agents in bath treatments to control fish diseases. Bath treatments are used to treat small fish in 600-gallon tanks at 100 ppm (mg/L). The Discharger has estimated the maximum concentration of penicillin G in the discharge from the NFH to be 8 mg/L and the maximum concentration from the ARTH to be significantly lower due to greater dilution. Oxytetracycline may be administered at similar concentrations (100 ppm) and, therefore, similar discharge concentrations would be expected.

Penicillin G, also known as Pen-G, is an antibiotic used in a six to eight hour immersion bath treatment to control acute disease outbreaks and has been used in the past at the Facility. Penicillin G is not approved under FDA's NADA program and its' extra-label

use in aquaculture requires a veterinarian's prescription. Due to the length of treatment time (up to eight hours), the Regional Board considered the results of acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limitations for penicillin G were necessary in this Order. Results of acute toxicity tests using *C. dubia* showed a 96-hour NOAEL of 890 mg/L. Results of 7-day chronic toxicity testing using *Pimephales promelas* showed 7-day NOEC for survival of 350 mg/L. The estimated discharge concentration of 8 mg/L of Penicillin G is well below the lowest NOEC and NOAEL. Therefore, at this time, penicillin G when used in an immersion bath treatment, is not discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of a narrative water quality objective for toxicity from the Basin Plans. Accordingly, this Order does not include an effluent limitation for penicillin G. However, monthly use of penicillin G must be reported as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information, and other information as it becomes available, and this Order may be reopened to establish effluent limitations for penicillin G based on additional use and toxicity information.

Oxytetracycline, also known by the brand name Terramycin®, is an antibiotic approved through FDA's NADA program for use in controlling ulcer disease, furunculosis, bacterial hemorrhagic septicemia, and pseudomonas disease in Salmonids. Oxytetracycline is most commonly used at CAAP facilities as a feed additive. However, oxytetracycline may also be used as an extra-label use under a veterinarian's prescription in an immersion bath of approximately six to eight hours in duration. Because Oxytetracycline may be applied in an immersion bath for up to eight hours at a time, the Regional Board considered the results of acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limitations for oxytetracycline used in an immersion bath treatment were necessary in this Order. Results of acute toxicity tests using *C. dubia* showed a 96-hour NOAEL of 40.4 mg/L. Results of chronic toxicity tests using *C. dubia* showed a 7-day NOEC for reproduction of 48 mg/L. The estimated discharge concentration of 8 mg/L of oxytetracycline is well below the lowest NOEC and NOAEL. Therefore, at this time, oxytetracycline when used in an immersion bath treatment, is not discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of a narrative water quality objective for toxicity from the Basin Plans. Accordingly, this Order does not include an effluent limitation for oxytetracycline. However, monthly use of oxytetracycline must be reported as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information, and other information as it becomes available, and this Order may be reopened to establish effluent limitations for oxytetracycline based on additional use and toxicity information.

53. Oxytetracycline, Romet-30® (sulfadimethoxine, ormetoprim), and florfenicol are antibiotics that may potentially be used by the Discharger in feed formulations to control acute disease outbreaks. Erythromycin (injected or used in feed formulations) and

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

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

sodium bicarbonate, 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 limits.

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

56. 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. R5-2005-_____ 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.

57. 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.

58. 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.

59. The Regional Board has considered the information in the attached Information Sheet in developing the findings in this Order. The attached Information Sheet and Attachments A, B and C are a part of this Order.

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

61. 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.

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

63. 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. 5-00-268 is rescinded and that the California Department of Fish and Game, their agents, successors and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following requirements, when discharging from the Nimbus Salmon and Steelhead Hatchery and the American River Trout Hatchery:

A. Discharge Prohibitions

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

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

3. Discharges from Outfall 002 directly to the American River in accordance with the terms of this Order are not considered a by-pass or overflow of untreated wastewater.

4. 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.

5. 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 – Outfall 001, Outfall 002, Outfall 003, and Outfall 004

1. The combined maximum daily dry weather discharge of flow-through wastewater from Outfalls 001, 002, 003, and 004 shall not exceed 90 million gallons per day (mgd).

2. Effluent discharged from Outfall 001, Outfall 002, Outfall 003, or Outfall 004 shall not have a pH less than 6.5 nor greater than 8.5 standard units unless influent pH, measured at the same time as effluent pH, is outside the range of 6.5 to 8.5 standard units. If influent pH is less than 6.5 standard units, effluent pH shall be a value between the measured influent pH and 8.5 standard units. If influent pH is greater than 8.5 standard units, then effluent pH shall be a value between 6.5 standard units and the influent pH.

3. Effluent discharged from Outfall 001, Outfall 002, Outfall 003, and Outfall 004 shall have a minimum daily dissolved oxygen concentration of 7.0 mg/L unless the influent dissolved oxygen concentration, measured at the same time, is less than 7.0 mg/L. If the influent dissolved oxygen concentration is less than 7.0 mg/L, then the effluent dissolved oxygen concentration shall be the same as or greater than the influent dissolved oxygen concentration.

4. Effluent discharges shall not exceed the following limitations at Outfall 001, Outfall 002, Outfall 003, or Outfall 004:

Constituent	Units	Average Monthly	Maximum Daily
Total Suspended Solids (TSS) (net) [1]	mg/L	5.0	15
Settleable Solids (net) [1]	mg/L	0.1	0.2
Turbidity	NTU		10
Total Dissolved Solids (TDS)	mg/L		125
Formaldehyde	mg/L	0.65	1.3
Copper (Total Recoverable)[2]	µg/L	**Calculate Limitation Based on Attachment C**	

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

[2] A daily maximum or monthly average total recoverable copper concentration shall be considered non-compliant with the applicable effluent limitation only if it exceeds the appropriate effluent limitation and the reported minimum level (ML). The highest acceptable ML for calibration purposes is 0.5 µg/l. Effluent and receiving water hardness must be measured concurrently with effluent copper concentration.

C. Discharge Specifications

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

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

3. Domestic sewage 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.

D. Best Management Practices (BMP) Plan

The Discharger shall develop and implement a Best Management Practices 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 minimizes the discharge of unconsumed food to surface waters.

b. Clean raceways at frequencies that minimize the disturbance and subsequent discharge of accumulated solids during routine activities.

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

2. Operations and Maintenance

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

b. 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.

c. 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.

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

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

E. Waste Disposal

1. Collected screenings, sludges, and other solids, including fish carcasses, shall be disposed of in a manner approved by the Executive Officer and consistent with *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste*, as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq.

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

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

F. Receiving Water Limitations for the American River

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 the American River:

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 200/100 ml or more than ten percent of the total number of samples taken during any 30-day period to exceed 400/100 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. In the event the receiving waters are determined to have a dissolved oxygen concentration of less than 7.0 mg/l because of natural conditions, the discharge shall not depress the dissolved oxygen concentration below 95 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 5ºF (3ºC).

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. Except for periods of storm runoff, turbidity exceeding 10 NTUs or 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.

G. Provisions

1. The Discharger shall comply with the attached Monitoring and Reporting Program No. R5-2005-0057, which is part of this Order, and any revisions thereto, as

ordered by the Executive Officer. If sufficient information is collected and indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numerical water quality standard, then this Order may be reopened to include effluent limitation(s) to achieve water quality standards. Additionally, if pollutants are detected in discharges from the Discharger's Facility, but insufficient information exists to establish an effluent limitation or determine if an effluent limitation is necessary, then the Discharger may be required to conduct additional monitoring to provide sufficient information.

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

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

   The Discharger also shall conduct, or submit the results of, acute toxicity tests in accordance with methods specified in *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 *Ceriodaphnia 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 may potentially 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, chemical water quality objective from the Basin Plans, or narrative water quality objective for toxicity from the Basin Plans, this Order may be reopened to established effluent limitations.

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

5. **Within 12 months of adoption of this Order,** the Discharger shall develop and implement a Best Management Practices (BMP) Plan that achieves the objectives and the specific requirements outlined in D. Best Management Practices Plan above. Through implementation of a BMP Plan, the Discharger shall prevent or minimize the generation and discharge of wastes and pollutants from the Facility to the waters of the United States. In the BMP Plan, each component of the Facility shall be evaluated by the Discharger for its waste minimization opportunities and its potential for causing a release of significant amounts of pollutants to receiving waters due to the failure or improper operation of equipment. The examination shall include all normal operations, including raw material and product storage areas, feeding of fish, internal movement of fish, cleaning of rearing/holding units and settling systems, processing and product handling areas, loading or unloading operations, spillage or leaks from the processing floor and dock, and sludge and waste disposal. The BMP Plan shall contain an explicit quantification of the inputs and outputs of the Facility, including fish, feed, feed components, mortalities due to predation and disease, dissolved and solid pollutants, and water. The BMP Plan shall contain a description of specific management practices and standard operating procedures used to achieve the above objectives, including, for example, schedules for solids removal from each waste collection component including what procedures will be used to determine when cleaning is necessary to prevent accumulated solids from being discharged. The BMP Plan shall contain a statement that the BMP Plan has

been reviewed and endorsed by the Facility Manager and the individuals responsible for implementation of the BMP operating plan. The Discharger shall ensure that its operations staff is familiar with the BMP Plan and have been adequately trained in the specific procedures that 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.

6. **Mercury Study: Within 36 months of adoption of this Order,** the Discharger shall submit to the Regional Board the results of an intake water study. The study shall include intake, effluent, and receiving water monitoring for mercury and be designed in accordance with Section 1.4.4 of the SIP to determine whether:

   a. The observed maximum ambient background concentrations of mercury and the intake water concentrations of mercury exceed the most stringent applicable criterion.
   b. Any potential intake credits are consistent with any TMDL applicable to the Discharger.
   c. The intake water is from the same body of water as the receiving water body.
   d. The facility does or does not contribute to or alter the intake water mercury in a manner that adversely affects water quality and beneficial uses
   e. The timing and location of the discharge does or does not cause adverse effects on water quality and beneficial uses that would not occur if the intake water pollutant had been left in the receiving water body.

   The Discharger shall comply with the following time schedule in conducting this mercury study:

Task	Compliance Date
Submit Workplan and Time Schedule	**6 Months after Adoption**
Begin Study	**9 Months after Adoption**
Complete Study	**33 months after Adoption**
Submit Final Study Report	**36 months after Adoption**

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

   If after review of the study results, this Order may be reopened to include final effluent limitations for mercury.

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

8. **Settling Ponds**: As noted in Finding 14, this Order requires monitoring of wastewater discharged to the settling ponds (new Outfall 005) and monitoring of the American River downstream of the settling ponds. Based upon results of this monitoring, this Order may be reopened to consider whether specific pollutant limitations for discharge to the settling ponds may be necessary.

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

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

11. 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.

12. This Order expires on **1 April 2010** 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.

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

    To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the State of Incorporation if a corporation, the name, address, and the telephone number of the persons responsible for contact with the Regional Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision D.6 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge

without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved in writing by the Executive Officer.

I, THOMAS R. PINKOS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Regional Board, Central Valley Region, on 29 April 2005.

THOMAS R. PINKOS, Executive Officer

29 April 2005
(Date)

Tt/JME

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2005-0057
NPDES NO. CA0004774
FOR
STATE OF CALIFORNIA - DEPARTMENT OF FISH AND GAME
NIMBUS SALMON AND STEELHEAD HATCHERY
AMERICAN RIVER TROUT HATCHERY
SACRAMENTO COUNTY

INTRODUCTION

This Monitoring and Reporting Program is issued pursuant to California Water Code Section 13383 and includes: influent monitoring of raw water supply, effluent monitoring of discharges to waters of the United States and waters of the State, monitoring of discharges to on-site settling ponds, 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 B of the Standard Provisions of this Order. Water quality sample collection, storage, and analyses shall be performed according to 40 CFR Part 136, or other methods approved and specified by the Executive Officer. Water and waste analyses shall be performed by a laboratory approved for these analyses by the State Department of Health Services (DHS).

INFLUENT MONITORING

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

Constituent	Unit	Type of Sample	Sampling Frequency
Influent flow	cfs or mgd	Calibrated meter, weir, or other approved method	Recorded monthly or when flow changes
Total Suspended Solids (TSS)	mg/L	Grab	1/month
Settleable Solids	ml/L	Grab	1/month
Mercury	µg/L	Grab	1/month
pH	standard units	Grab	1/month
Dissolved Oxygen (DO)	mg/L	Grab	1/month

EFFLUENT MONITORING
Outfall 001, Outfall 002, Outfall 003, and Outfall 004

Effluent samples shall be collected from the last connection through which wastes can be admitted into the outfall. Effluent samples shall be representative of the volume and quality of the discharge. Effluent samples shall be collected once a month 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. Outfall 004 need only be monitored in the event the settling ponds overflow and there is a direct discharge to the American River. An alternative inclement weather sampling point for Outfall 002 has been identified as the manhole approximately 80 feet south of the nominal Outfall 002 sampling point. **Any other alternate sampling point (e.g., due to inclement weather) must be approved by the Executive Officer and must be representative of the entire volume and nature of the discharge**. Effluent monitoring at Outfalls 001, 002, 003, and 004 shall include the following:

Constituent	Units	Type of Sample	Sampling Frequency
Effluent Flow	cfs	Calibrated meter, weir, or other approved method	Recorded monthly or when flow changes

Constituent	Units	Type of Sample	Sampling Frequency
Total suspended solids (TSS)	mg/L	Grab	1/month
Net TSS (effluent minus influent)	mg/L	Net calculation	1/month
Settleable solids	ml/L	Grab	1/month
Net settleable solids (effluent minus influent)	ml/L	Net Calculation	1/month
Dissolved oxygen (DO)	mg/L	Grab	1/month
Turbidity	NTU	Grab	1/month
Total Dissolved Solids (TDS) [1]	mg/L	Grab	1/month
Conductivity @ 25°C (Specific Conductance)[1]	µmhos/cm	Grab	1/month (during sodium chloride or calcium chloride use)
Formaldehyde[2]	mg/L	Grab	1/month during use
Copper (Total Recoverable)[3]	µg/L	Grab	1/month during use
Mercury	µg/L	Grab	1/month
pH	standard units	Grab	1/month
Hardness (as $CaCO_3$) [4]	mg/L	Grab	1/month
Hydrogen peroxide [5]	mg/L	Grab	1/month during use
Potassium permanganate [5]	mg/L	Grab	1/month during use
PVP Iodine[5]	mg/L	Grab	1/month during use
Chloramine-T[5]	mg/L	Grab	1/month during use
MS-222[5]	mg/L	Grab	1/month during use
Aqui-S®[5]	mg/L	Grab	1/month during use

[1] In months when sodium chloride or calcium chloride is added to waters of the Facility, conductivity and TDS concentration shall be measured during sodium chloride or calcium chloride use.

[2] In months when formalin is added to the waters of the Facility, formaldehyde concentration shall be measured during formalin use.

[3] In months when copper (e.g., copper sulfate) is added to the waters of the Facility, total recoverable copper concentration shall be measured during copper use. A daily maximum or monthly average total recoverable copper concentration shall be considered non-compliant with the applicable effluent limitation only if it exceeds the effluent limitation and the reported minimum level (ML). The highest acceptable ML for calibration purposes is 0.5 µg/L. The sample shall be collected during the time of peak discharge of copper, at least one hour after start of

treatment. Effluent and receiving water hardness shall be measured concurrently with effluent total recoverable copper concentration.

[4] Hardness must be measured daily during copper (e.g., copper sulfate) treatments.

[5] The analytical method used for hydrogen peroxide, potassium permanganate, PVP Iodine, chloramine-T, MS-222, and Aqui-S® 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.

DISCHARGE TO SETTLING PONDS – Outfall 005

To ensure adequate characterization of wastewater from the Facility during drug and chemical treatment, monitoring of wastewater discharged to the settling ponds is required. This new monitoring (and newly labeled) point will be Outfall 005. Monitoring at Outfall 005 shall include the following:

Constituent	Units	Type of Sample	Sampling Frequency
Flow	cfs	Calibrated meter, weir, or other approved method	Recorded monthly or when flow changes
Total Dissolved Solids (TDS) [1]	mg/L	Grab	1/month
Conductivity @ 25°C (Specific Conductance)[1]	µmhos/cm	Grab	1/month (during sodium chloride use)
Formaldehyde[2]	mg/L	Grab	1/month during use
Copper (Total Recoverable)[3]	µg/L	Grab	1/month during use
Mercury	µg/L	Grab	1/month
pH	standard units	Grab	1/month
Hardness (as $CaCO_3$) [4]	mg/L	Grab	1/month
Hydrogen peroxide [5]	mg/L	Grab	1/month during use
Potassium permanganate [5]	mg/L	Grab	1/month during use
PVP Iodine[5]	mg/L	Grab	1/month during use
Chloramine-T[5]	mg/L	Grab	1/month during use
MS-222[5]	mg/L	Grab	1/month during use
Aqui-S®[5]	mg/L	Grab	1/month during use

[1] In months when sodium chloride or calcium chloride is added to waters of the Facility, conductivity and TDS concentration shall be measured during sodium chloride or calcium chloride use.

[2] In months when formalin is added to the waters of the Facility, formaldehyde concentration shall be measured during formalin use.

[3] In months when copper (e.g., copper sulfate) is added to the waters of the Facility, total recoverable copper concentration shall be measured during copper use. The highest acceptable ML for calibration purposes is 0.5 µg/L. The sample shall be collected during the time of peak discharge of copper, at least one hour after start of treatment. Effluent and receiving water hardness shall be measured concurrently with effluent total recoverable copper concentration.

[4] Hardness must be measured daily during copper (e.g., copper sulfate) treatments.

[5] The analytical method used for hydrogen peroxide, potassium permanganate, PVP Iodine, chloramine-T, MS-222, and Aqui-S® 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.

RECEIVING WATER MONITORING IN THE AMERICAN RIVER

Receiving water samples shall be collected when fish are being held at the Facility. 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:

Station	Description
R-1	100 feet upstream from the Fish Ladder
R-2	100 feet downstream from the seepage points from the settling ponds

Constituent	Unit	Station	Sampling Frequency
Flow	cfs or mgd	R-1	1/month
pH	standard units	R-1, R-2	1/month
Temperature	ºC	R-1, R-2	1/month
Dissolved Oxygen	mg/L	R-1, R-2	1/month
Total Dissolved Solids (TDS)	mg/L	R-1, R-2	1/month
Conductivity @ 25°C (Specific Conductance)[1]	µmhos/cm	R-1, R-2	1/month
Turbidity	NTU	R-1, R-2	1/quarter
Hardness (as $CaCO_3$) [2]	mg/L	R-1	1/month
Copper (Total Recoverable)[3]	µg/L	R-1, R-2	1/month during use
Mercury	µg/L	R-1, R-2	1/quarter

[1] In months when sodium chloride or calcium chloride is added to waters of the Facility, conductivity shall be measured during sodium chloride or calcium chloride use.

[2] In months when copper (e.g., copper sulfate) is added to waters of the Facility, receiving water hardness shall be measured during copper use.

[3] In months when copper (e.g., copper sulfate) is added to the waters of the Facility, total recoverable copper concentration shall be measured during copper use. The highest acceptable ML for calibration purposes is 0.5 µg/L. The sample shall be collected during the time of peak discharge of copper, at least one hour after start of treatment. Effluent and receiving water hardness shall be measured concurrently with effluent total recoverable copper concentration.

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

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

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

MONTHLY DRUG AND CHEMICAL USE REPORT

Order R5-2005-____ prohibits the discharge of aquaculture chemicals and drugs unless the Regional Board has received prior notice in accordance with Provision G.3. of Order R5-2005-____, the following information shall be submitted for all aquaculture drugs or chemicals used at the Facility. This information shall be reported at **monthly** intervals using the appropriate Monthly Discharge Monitoring Reports:

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

b. The date(s) of application.

c. The purpose(s) for the application.

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

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

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

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

Calculation of Concentration:

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

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

$$C = \frac{\text{(treatment concentration) x (volume of water through treatment area during treatment time)}}{\text{(volume of water through facility during treatment time + volume of settling basin)}}$$

Example: Oxytetracycline concentration

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

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

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

SEPTIC TANK MONITORING AND INSPECTIONS

Septic tank maintenance inspections (including tank sludge level measurement) 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 and the Annual Report.

LEACHFIELD MONITORING

The Discharger shall inspect leachfield areas monthly 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.

PRIORITY POLLUTANT METALS MONITORING

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

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

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

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

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

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

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

a. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory.
b. Sample results less than the reported ML, but greater than or equal to the laboratory's MDL, shall be reported as "Detected but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.
c. For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration." Numerical estimates of data quality may be by percent accuracy (+ or – a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.
d. Sample results that are less than the laboratory's MDL shall be reported as "Not Detected" or ND.

GENERAL REPORTING REQUIREMENTS

The Discharger shall implement this monitoring program on the first day of the month following adoption of the Order. The Discharger shall submit monthly Discharge Monitoring Reports to the Regional Board by the **first day of the second month** following sample collection. Annual monitoring reports shall be submitted by **30 January** each year. All reports submitted in response to this Order shall comply with signatory requirements of Standard Provision D.6.

By **30 January of each year**, the Discharger shall submit a written Annual Report to the Executive Officer containing the following information (Reports may refer to monthly monitoring data previously submitted where applicable):

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

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

3. A summary of all feeding practices used at the facility on a monthly basis including:
   a. The name(s), type(s) and amount(s) of feed(s) used.
   b. The percent of phosphorus in the feed(s) used (as available).
   c. The method and frequency of feeding.

4. Septic tank inspection and maintenance report.

5. Monthly records documenting cleaning, inspections, maintenance, and repairs of all fish production and/or settling ponds.

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

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

29 April 2005
(Date)

Tt/JME

INFORMATION SHEET

ORDER NO. R5-2005-0057
STATE OF CALIFORNIA DEPARTMENT OF FISH AND GAME
NIMBUS SALMON AND STEELHEAD HATCHERY
AMERICAN RIVER TROUT HATCHERY
SACRAMENTO COUNTY

FACILITY DESCRIPTION

The California Department of Fish and Game (DFG) (hereafter Discharger) operates the Nimbus Salmon and Steelhead Hatchery (NFH) and the American River Trout Hatchery (ARTH) on land owned by the United States Bureau of Reclamation at 2001 Nimbus Road in Rancho Cordova, Sacramento County, California. The facilities are co-located and regulated under a single NPDES permit and are hereafter referred to as the Facility. The NFH produces juvenile Chinook salmon and steelhead trout to mitigate for the loss of anadromous fisheries resources due to the operation of Folsom and Nimbus dams. The NFH traps adult fish, collects, incubates, and hatches fish eggs, and rears juvenile fish. The fish are reared for up to a year, based on management strategy, and trucked to release sites. The fish rearing occurs in concrete raceways utilizing a flow-through, single-pass water system. The NFH consists of a fish ladder for adult salmon and steelhead, four holding ponds for adult fish, a spawning deck for egg removal and fertilization, two hatchery buildings (No. 1 and 2), six 10-ft by 400-ft raceways for rearing, and ancillary operations. The NFH's current goal for fish rearing is approximately 430,000 steelhead and 4 million salmon per year. Fish are transferred from the NFH to California water bodies for release. The ARTH obtains fish eggs or fingerling fish from other hatcheries, or collects fish eggs at remote sites. The eggs are incubated and hatched, and fish are reared to various sizes to accommodate management strategies. Most of the fish are reared for almost a year to reach "catchable size" (1/2 pound). The ARTH receives fertilized trout eggs for hatching and raises fish in one hatchery building, four 10-ft by 200-ft nursery ponds, and ten 10-ft by 600-ft raceways. A small number of inland salmon are also raised at the ARTH. A fish disease control laboratory is located at the ARTH. The ARTH's current goal for fish rearing is approximately one million fish per year. Fish are transferred from the ARTH to several California water bodies for release.

In its Report of Waste Discharge, dated 17 July 2002, the Discharger reported the following total yearly harvestable weights: 600,000 lbs of trout, 70,000 lbs of salmon, and 130,000 lbs of steelhead. The Discharger also reported 90,000 lbs of food fed during the month of maximum feeding (May). The Facility meets the criteria for a concentrated aquatic animal production (CAAP) facility, as established by USEPA at 40 Code of Federal Regulations (CFR) 122.24, as discussed below.

The NFH and the ARTH receive water from Lake Natoma, upstream from Nimbus Dam, via a common 60-inch line. Lake Natoma is part of the American River system which flows from the Sierra Nevada mountain range to Folsom Lake, through Lake Natoma, to the Sacramento River. Combined water intake for both hatcheries was reported by the Discharger as approximately 39 to 45 million gallons per day (mgd), and, as stated in the previous Order, can be as high as 90 mgd. Intake flow is controlled by the Discharger and is adjusted to meet operational needs (e.g., intake flow is reduced when the raceways are cleaned). The hatcheries also receive minor flow from Lake Natoma via an older 42-inch line (estimated to be less than 4.2 mgd). Flow through the 42-inch line

is maintained to prevent water in the line from becoming stagnant. All water is used on a once-through basis, and is discharged to the American River through four outfalls (001, 002, 003, and 004).

The Facility includes two parallel settling ponds for the disposal of wastewater from raceways and rearing ponds during normal cleaning operations, and from the incubator building, the fish disease lab, and local surface drainage. The settling ponds were constructed in highly permeable gravels, which allow the entire flow to indirectly discharge to the American River through seepage. The settling ponds were also constructed with overflow facilities to a 12-inch pipe that discharges directly to the American River (Outfall 004). Total flow to these ponds varies from approximately 20 to 40 mgd. Because of rapid infiltration within the ponds, the Discharge reports that the ponds have not overflowed and discharged via Outfall 004 directly to the American River for at least the last six years.

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. According to monthly self-monitoring and laboratory reports submitted by the Facility between March 2000 and September 2003, influent water quality had the following characteristics.

Constituent	Units	Min	Max	Avg *
Total Suspended Solids (TSS)	mg/L	< 1.0	6.2	1.9
Settleable Solids	ml/L	0**	0**	0**
pH	standard units	6.6	8.0	--
Total Dissolved Solids (TDS)	mg/L	24	117	45
Turbidity	NTUs	0.51	3.5	1.2
Dissolved Oxygen	mg/L	5.3	12.2	9.3
Conductivity	µmhos/cm	39	218	62

* Average of quantifiable values only
** Settleable solids reported as "0" rather than < Reportable Level

Overflow from the NFH holding ponds and fresh water, if needed, comprise the water discharged from the NFH fish ladder to the American River through Outfall 001. Discharge from Outfall 001 is seasonal, with flow typically from November to April when the fish ladder is open. The Discharger has estimated the flow from Outfall 001 to be 19 mgd. Based on data from monthly self-monitoring and laboratory reports submitted by the Facility between March 2000 and September 2003, the following effluent characteristics describe the discharge from Outfall 001:

Constituent	Units	Min	Max	Avg *
TSS	mg/L	< 1.0	7.1	2.9
Settleable Solids	ml/L	0**	0**	0**
pH	standard units	6.9	7.9	--
TDS	mg/L	23	82	43.9

Constituent	Units	Min	Max	Avg *
Turbidity	NTUs	0.66	5.5	2.1
Dissolved Oxygen	mg/L	7.8	11.6	10.6
Conductivity	µmhos/cm	48	88	65.0

* Average of quantifiable values only
** Settleable solids reported as "0" rather than < Reportable Level

Wastewaters from the NFH hatchery buildings (water used for egg incubation and hatching) and the NFH spawning deck (water used during egg removal) are discharged to the American River through Outfall 002. The Discharger has estimated Outfall 002 flow to be 3 mgd. Based on data from monthly self-monitoring and laboratory reports submitted by the Facility between March 2000 and September 2003, the following effluent characteristics describe the discharge from Outfall 002:

Constituent	Units	Min	Max	Avg *
TSS	mg/L	< 1.0	10	2.6
Settleable Solids	ml/L	0**	0**	0**
pH	standard units	6.9	8	--
TDS	mg/L	20	98	43.1
Turbidity	NTUs	0.52	4.8	1.6
Dissolved Oxygen	mg/L	7.3	12.1	9.9
Conductivity	µmhos/cm	44	88	63.3

* Average of quantifiable values only
** Settleable solids reported as "0" rather than < Reportable Level

Outfall 003 consists solely of wastewater from the ARTH rearing ponds (raceways). Approximately 50% of the ARTH rearing ponds flow during normal operations is directly discharged to the American River through Outfall 003. All flow from the ARTH raceways is diverted to the settling ponds when the raceways are being cleaned, or when treatment chemicals are added. The estimated flow from Outfall 003 is 18 mgd. Based on data from monthly self-monitoring and laboratory reports submitted by the Facility between March 2000 and September 2003, the following effluent characteristics describe the discharge from Outfall 003:

Constituent	Units	Min	Max	Avg *
TSS	mg/L	< 1.0	7.4	3.4
Settleable Solids	ml/L	0**	0**	0**
pH	standard units	6.6	7.8	--
TDS	mg/L	16	100	45.0
Turbidity	NTUs	0.67	7.2	1.5
Dissolved Oxygen	mg/L	5.8	9.8	7.8
Conductivity	µmhos/cm	39	90	62.0

* Average of quantifiable values only
** Settleable solids reported as "0" rather than < Reportable Level

Outfall 004 discharges to the American River any overflow from the two settling ponds at the Facility. The settling ponds receive wastewaters from the following sources: 50% of the flow from the ARTH rearing ponds (the other 50% of flow from the ARTH rearing ponds is discharged through Outfall 003, as described previously), all the wastewater flows from the NFH hatchery raceways, the ARTH hatchery building, the ARTH nursery ponds, and the ARTH fish disease laboratory. Because the ponds are permeable and discharge to the American River via seepage, the Discharger reports it has not discharged from Outfall 004 for at least six years.

Outfall 005: As described previously, the Discharger reports it has not discharged from Outfall 004 (overflow from the settling ponds) for at least six years. To ensure adequate characterization of wastewater from the Facility during drug and chemical treatment and the potential effects of percolation from the settling ponds to surface waters, this Order requires monitoring of wastewater discharged to the settling ponds (new Outfall 005) and monitoring of the American River downstream of the settling ponds, as required by the previous Order. No numeric discharge specifications are applied to Outfall 005

Water used for cleaning lab glassware is discharged to a closed system at the Fish and Wildlife Pollution Control Laboratory, which is under separate requirements of another Waste Discharge Requirements Order. Such wastewater is disinfected and sent to a lined evaporation waste pond that has no discharge to surface or ground waters. All domestic wastewater is discharged to an on-site septic system, which is regulated by the County of Sacramento.

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. Since May 2000, the Discharger has reported the use of the following drugs and chemicals at the Facility: copper sulfate, formalin (as a 37% formaldehyde, methanol-free solution), sodium chloride (salt), hydrogen peroxide, potassium permanganate, oxytetracycline (Terramycin®) as a feed additive, and penicillin G.

The Discharger indicated in its Report of Waste Discharge and confirmed in a subsequent communication with the Regional Board, dated 23 April 2004, the potential use of the following additional aquaculture drugs and chemicals in the future: acetic acid, calcium chloride, P.V.P. iodine/iodophor, chloramine-T, tricaine methanesulfonate (MS-222), Aqui-S®, soluble oxytetracycline, Romet-30® (sulfadimethoxine-ormetoprim), florfenicol, carbon dioxide, sodium bicarbonate, amoxycillin, erythromycin, vibrio vaccine, and enteric redmouth bacertin.

APPLICABLE REGULATIONS, POLICIES, AND PLANS

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

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

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

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

USEPA has 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. The Basin Plan, as amended, designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for waters of the Basin. Pursuant to the California Water Code Section 13263(a), waste discharge requirements must implement the Basin Plan.

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

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

Section 303 (d) of the CWA requires states to identify waters for which implementation of technology-based effluent limitations have not been stringent enough to attain water quality standards for those waters. On 25 July 2003 the USEPA approved the State's updated list of 303 (d) impaired waters, which lists the Lower American River between Nimbus Dam and the Sacramento River as impaired for mercury, with the potential sources identified as abandoned mines, and unknown toxicity.

Regulation of Aquaculture Drugs and Chemicals

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

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

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

Summary of Regulatory Authorities

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

FDA's Center for Veterinary Medicine (CVM) regulates the manufacture, distribution, and use of animal drugs. CVM is responsible for ensuring that drugs used in food-producing animals are safe and effective and that food products derived from treated animals are free from potentially harmful

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

RECEIVING WATER BENEFICIAL USES

The existing beneficial uses of the American River from Folsom Dam to the Sacramento River, as identified in Table II-1 of the Basin Plan, are municipal and domestic supply (MUN); irrigation (AGR); industrial service and power supply (IND, and POW); water contact recreation (including canoeing and rafting) (REC-1); non-contact water recreation (REC-2); warm and cold freshwater habitat (WARM and COLD); warm and cold water fish migration habitat (MIGR); warm and cold water spawning habitat (SPWN); and wildlife habitat (WILD).

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

REASONABLE POTENTIAL ANALYSIS AND EFFLUENT LIMITATIONS

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

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

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

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs, the Regional Board determined that technology-based effluent limitations for total suspended solids (TSS) and settleable solids.

Total Suspended Solids and Settleable Solids

USEPA's final ELG for the aquaculture industry does not include numeric effluent limitations on any conventional, non-conventional, or toxic constituents. Rather, USEPA promulgated qualitative limitations in the form of BMP requirements. Technology-based requirements in this Order are based on a combination of application of the ELG for BMP requirements and case-by-case numeric limitations developed using best professional judgment (BPJ) and carried over from the previous Order. Section 402(o) of the CWA prohibits backsliding of effluent limitations that are based on BPJ to reflect a subsequently promulgated ELG that is less stringent. Order No. 5-00-268 (a revised Order) established effluent limitations for TSS of 5.0 mg/L net over levels in influent and 15 mg/L net as a monthly average and daily maximum, respectively, based on BPJ. In addition, the Order established effluent limitations for settleable solids of 0.1 ml/L net and 0.2 ml/L net as a monthly average and daily maximum, respectively, based on BPJ. Results of monitoring indicate the

Discharger is capable of meeting these limitations. Removal of these numeric limitations for TSS and settleable solids would constitute backsliding under CWA Section 402(o). The Regional Board has determined that these numeric effluent limitations for TSS and settleable solids continue to be applicable to the Facility and that backsliding is not appropriate. These limitations are established as a means of controlling the discharge of solids from algae, silt, fish feces and uneaten feed. This Order does not include mass effluent limitations for TSS because there are no standards that specifically require a mass-based effluent limitation, mass of the pollutant discharged is not specifically related to a measure of operation (40 CFR 122.45(f)(iii)), and, in addition, mass-based effluent limitations for TSS are not necessary because this Order includes both concentration-based limitations and a maximum flow limitation. These changes are consistent with Federal anti-backsliding provisions of 40 CFR 122.44(l)(1) and 122.62(a)(2).

Relationship Between Technology-based and Water Quality-based Requirements

In addition to establishing technology-based requirements based on the USEPA's ELG and BPJ, the Regional Board also considered the need for water quality-based limits for these pollutants. As the previous Order, the Regional Board determined that the TSS and settleable solids limitations are sufficient to ensure attainment of Basin Plan water quality objectives for sediment, settleable material, and suspended material.

WATER QUALITY-BASED EFFLUENT LIMITATIONS (WQBELs)

Based on effluent and receiving water study data submitted by the Discharger, routine effluent and receiving water monitoring, information from the Discharger regarding use of aquaculture drugs and chemicals, and DFG toxicity studies for aquaculture drugs and chemicals, the discharge has the reasonable potential to cause or contribute to an in-stream excursion above narrative or numeric water quality criteria or objectives for copper, pH, and formaldehyde. As required by 40 CFR Part 122.44 (d)(1)(i)-(iii), this Order includes effluent limitations for copper, pH, and formaldehyde. In addition, this Order carries over from the previous Order effluent limitations for dissolved oxygen (DO), turbidity, and total dissolved solids (TDS) based on water quality objectives from the Basin Plan.

In situations where receiving water flows are substantially greater than effluent flows, dilution may be considered in establishing effluent limitations. However, when a receiving water is impaired by a particular pollutant or stressor, limited or no pollutant assimilative capacity may be available in spite of the available dilution. Additionally, water quality based effluent limitations may be established considering acute wasteload allocations and the need to prevent acutely toxic conditions at the point of discharge. In these instances, and depending upon the nature of the pollutant, effluent limitations may be set equal to or less than the applicable water quality criteria or objectives that are applied at the point of discharge such that the discharge will not cause or contribute to a receiving water excursion above water quality objectives established to protect the beneficial uses. The copper and formaldehyde effluent limitations are based upon protection of

aquatic life from acute effects. Therefore, it is appropriate to calculate effluent limitations with no dilution allowance.

CTR Constituents

On 10 September 2001, the Executive Officer of the Regional Board issued a letter pursuant to Section 13267 of the California Water Code (CWC) requiring all NPDES Dischargers to conduct effluent and receiving water monitoring and submit results of this monitoring in accordance with a time schedule provided in the letter. The Discharger conducted a study to determine whether levels of NTR, CTR, or other pollutants in the discharge have the reasonable potential to cause or contribute to an in-stream excursion above a numeric or narrative water quality standard, including Basin Plan numeric or narrative objectives and CTR/NTR criteria. Results of this study were submitted to the Regional Board for samples taken on 9 April 2002 and 9 September 2003.

Copper

Copper, primarily in the forms of copper sulfate and chelated copper compounds, is used in fish hatcheries to control algae and other vegetation that is susceptible to the toxic effects of copper uptake, and it is used to control the growth of external parasites and bacteria on fish. Copper sulfate may be used at the Facility in the future at a rate of up to 0.5 pounds copper sulfate per 1 cfs in raceways. Lack of accurate flow measurements for the raceways precludes meaningful estimates of potential concentrations of copper in the discharge to or from the settling ponds. Copper concentration in the composited discharge from the Facility was 1.3 µg/L, but this sample represents the combined discharge from all outfalls and was not taken during copper treatments. Estimated potential discharge copper concentrations during copper treatments from other DFG facilities (Mt. Shasta, Mokelumne, Merced) range from 58 to 200 µg/L.

Copper is identified as a priority pollutant in the NTR and CTR. The CTR includes the Ambient Water Quality Criteria for the Protection of Aquatic Life for copper. The Criterion Maximum Concentration (CMC), a 1-hour average, and Criterion Continuous Concentration (CCC), a 4-day average, are hardness dependent. The criteria are expressed in terms of the dissolved fraction of the metal in the water column and are calculated from the total recoverable values by applying a conversion factor. The conversion factor in the CTR is 0.96 for both acute (CMC) and chronic (CCC) criteria. The applicable criteria will be based on the hardness of the effluent or receiving water. Water quality criteria for copper for the protection of aquatic life, as established by the CTR are 3.4 µg/L (acute) and 2.6 µg/L (chronic) criteria for dissolved copper (3.5 and 2.7 µg/L total recoverable) at 23 mg/L hardness, which is the minimum effluent and receiving water hardness reported with the Facilitiy's CTR monitoring. The site-specific copper criterion (acute) from the Basin Plan for the Lower American River (between Folsom Dam and the Sacramento River) is 10.4 µg/L (total recoverable). Based on DFG's estimates of potential application rates and flows, there is reasonable potential for copper to be present in the discharge at levels exceeding water quality criteria for the protection of aquatic life from the CTR. Accordingly, this Order includes WQBELs for copper.

Effluent limitations must be expressed as a total recoverable concentration. Since a site-specific translator has not been developed for copper as described in the SIP Section 1.4.1, the USEPA conversion factor for copper of 0.960 was used for translating the dissolved copper criterion into a total recoverable effluent concentration allowance (ECA) with no dilution. The Regional Board established both an Average Monthly Effluent Limitation (AMEL) and Maximum Daily Effluent Limitation (MDEL) for copper based on procedures outlined in the SIP as shown in Attachment C.

Because the toxicity of several metals increases with decreasing hardness levels in the receiving water, the CTR criteria for some metals, including copper, must be adjusted to account for the hardness of the effluent. The site-specific, acute criterion from the Basin Plan is fixed at 10.4 µg/L and is more stringent than the CTR acute criterion when receiving water hardness equals or exceeds 73 mg/L. The following table shows sample calculations of the CTR criteria for copper (fresh water aquatic life criteria), adjusted to account for varying hardness levels and expressed as total recoverable metal based on the following formulae:

Chronic Criterion (from CTR)

$Cu_{chronic}$ (in µg/L) = $e^{(0.8545)(\ln \text{hardness})-1.702}$

Acute Criterion (CTR) for Receiving Water Hardness Less Than 73 mg/L:

Cu_{acute} = (in µg/L) = $e^{(0.9422)(\ln \text{hardness})-1.700}$

Sample Calculations of Aquatic Life Criteria for Copper as Total Recoverable Metal

	Aquatic Life Criteria (µg/L)	
Effluent Hardness	**Chronic**	**Acute**
20 mg/L $CaCO_3$	2.36	3.07
25 mg/L $CaCO_3$	2.85	3.79
30 mg/L $CaCO_3$	3.33	4.50
35 mg/L $CaCO_3$	3.80	5.21
40 mg/L $CaCO_3$	4.26	5.90
45 mg/L $CaCO_3$	4.72	6.60
50 mg/L $CaCO_3$	5.16	7.29
60 mg/L $CaCO_3$	6.03	8.65
70 mg/L $CaCO_3$	6.88	10.0

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

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

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

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

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

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

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

where

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

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

Sample Calculations of Long-Term Average Concentrations of Copper

	ECA		ECA Multiplier		LTA (µg/L)	
Receiving Water Hardness	**Chronic**	**Acute**	**Chronic**	**Acute**	**Chronic**	**Acute**
20 mg/L $CaCO_3$	2.36	3.07	0.527	0.321	1.24	0.986
25 mg/L $CaCO_3$	2.85	3.79	0.527	0.321	1.50	1.22
30 mg/L $CaCO_3$	3.33	4.50	0.527	0.321	1.76	1.44
35 mg/L $CaCO_3$	3.80	5.21	0.527	0.321	2.00	1.67
40 mg/L $CaCO_3$	4.26	5.90	0.527	0.321	2.25	1.90
45 mg/L $CaCO_3$	4.72	6.60	0.527	0.321	2.48	2.12
50 mg/L $CaCO_3$	5.16	7.29	0.527	0.321	2.72	2.34
60 mg/L $CaCO_3$	6.03	8.65	0.527	0.321	3.18	2.78
70 mg/L $CaCO_3$	6.88	10.0	0.527	0.321	3.62	3.21

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

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

where

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

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

AMEL multiplier. From Table 2 of the SIP, the MDEL multiplier is 3.11, and the AMEL multiplier is 1.55. Final WQBELs for copper are determined as follows.

Sample Calculations Effluent Limitations for Copper

Receiving Water Hardness	LTA	AMEL Multiplier	MDEL Multiplier	MDEL (µg/L)	AMEL (µg/L)
20 mg/L $CaCO_3$	0.986	1.55	3.11	1.53	3.07
25 mg/L $CaCO_3$	1.22	1.55	3.11	1.89	3.79
30 mg/L $CaCO_3$	1.44	1.55	3.11	2.24	4.49
35 mg/L $CaCO_3$	1.67	1.55	3.11	2.59	5.20
40 mg/L $CaCO_3$	1.90	1.55	3.11	2.94	5.89
45 mg/L $CaCO_3$	2.12	1.55	3.11	3.28	6.59
50 mg/L $CaCO_3$	2.34	1.55	3.11	3.62	7.27
60 mg/L $CaCO_3$	2.78	1.55	3.11	4.30	8.64
70 mg/L $CaCO_3$	3.21	1.55	3.11	4.98	9.99

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

Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit*." Although the effluent limitations for copper are new requirements in this Order, the Discharger has not reported using used copper sulfate at the Facility in recent years and, therefore, should be able to manage use of copper sulfate to comply with the new effluent limitations. This Order does not establish a compliance schedule for copper limitations in this Order, but requires compliance with final effluent limitations for copper immediately.

Mercury

The Lower American River between Nimbus Dam and the Sacramento River is impaired by mercury. Mercury is identified as a priority pollutant in the NTR and CTR. The CTR includes the Ambient Water Quality Criterion for the Protection of Human Health (for consumption of water and organisms) of 0.050 µg/L for mercury. The Discharger collected two effluent and two receiving water samples for mercury. Mercury was detected in the Facility's effluent at concentrations of 0.00115 µg/L and 0.0781 µg/L. Mercury concentrations in the receiving water were reported as 0.00081 and 0.00143 µg/L. The maximum effluent concentration of mercury exceeds the CTR criterion. However, the there are no known processes or materials which the Discharger uses as a result of hatchery operation that contain or contribute mercury to the final effluent. For this Facility, intake water is from the same water body as the receiving water body. In accordance with Section 1.4.4 of the SIP, the Regional Board may consider priority pollutants in intake water on a

pollutant-by-pollutant and discharge-by-discharge basis when establishing water quality based effluent limitations provided certain conditions are met. The current data are insufficient to determine whether effluent concentrations of mercury are a result of spatial or temporal changes in mercury concentrations of the influent supply water, or may be influenced by groundwater accretions within the settling ponds. Therefore, this Order requires the Discharge to conduct a study of influent, effluent, and receiving water mercury concentrations to determine whether mercury is discharged from the facility at levels that cause, have the reasonable potential to cause, or contribute to an excursion of applicable water quality standards. Based upon the results of this study, this Order may be reopened to include final effluent limitations for mercury based upon the CTR criterion, a load allocation from the TMDL, or, limitations which reflect intake water credits in accordance with Section 1.4.4 of the SIP if applicable.

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). In the previous Order, the Regional Board established effluent limitations in the form of an acceptable range of pH between 6.5 and 8.5 standard units for discharges to the American River. This existing pH limitation is carried over to this Order with the addition, however, that an effluent pH outside of this range is acceptable only where influent pH measured at the same time also is outside the range. In such cases, effluent pH may be outside the acceptable range, but only to the same extent that influent pH is outside of this range. This limitation will control the discharge of drugs or chemicals (e.g., acetic acid) that may alter the pH of the effluent. Based on recent self-monitoring reports, the discharge has remained within the acceptable range.

Dissolved Oxygen (DO)

The Basin Plan contains water quality objectives for dissolved oxygen (DO) concentrations not to be reduced below minimum levels (measured in mg/L). For waters designated COLD and SPWN, the Basin Plan specifies that the DO concentrations shall not be reduced below 7.0 mg/L at any time. In the previous Order, the Regional Board established effluent limitations requiring a minimum DO concentration of 7 mg/L for discharges to the American River. Based on self-monitoring reports, the discharge and receiving water DO concentrations have periodically fallen below 7.0 mg/L. The existing DO limitation is carried over to this Order with the addition, however, that an effluent DO below 7.0 mg/L is acceptable only where influent DO measured at the same time also is outside the range and there is no reduction in DO from the influent to the effluent.

Turbidity

The Basin Plan contains turbidity water quality objectives for the American River from Folsom Dam to the Sacramento River. Except for periods of storm runoff, the Basin Plan specifies that the

turbidity shall be less than or equal to 10 NTUs. The previous Order included an effluent limitation for turbidity of 10 NTUs as a maximum daily limitation. To ensure continued compliance with the water quality objective from the Basin Plan, this effluent limitation is retained in this Order.

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 (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

A 37 percent formaldehyde solution (formalin) is periodically used at hatcheries as a fungicide treatment on fish eggs and fish in the raceways. Although the Discharger has not used formalin on a routine basis, it has requested the ability to use formalin in the future. Formalin (also known by the trade names Formalin-F®, Paracide-F®, PARASITE-S®) is approved through FDA's New Animal Drug Application (NADA) program for use in controlling external protozoa and monogenetic trematodes on fish, and for controlling fungi of the family *Saprolegniacae* in food-producing aquatic species (including trout and salmon). For control of other fungi, formalin may be used under an Investigational New Animal Drug (INAD) exemption. Formalin typically is used as a "drip" treatment to control fungus on fish eggs at a concentration of 1,000 to 2,000 ppm for 15

minutes, or as a "flush" treatment in raceways of 1-8 hours in duration at a concentration of 170 to 250 ppm for 1-hour or, based on DFG use assumptions, at 25 ppm for 8-hours. Lack of accurate flow measurements for the raceways precludes meaningful estimates of formaldehyde concentrations in the discharge to the settling ponds. Monitoring reports from May 2000 through September 2003 indicate no detected concentrations of formaldehyde in the discharges from Outfall 001, Outfall 002, or Outfall 003. However, in May 2000, the Discharger sampled the settling ponds and receiving water for formaldehyde and found that the settling ponds contained formaldehyde at a concentration of 1.4 mg/L and a sample from the American River 100 feet downstream of the settling ponds contained formaldehyde at a concentration of 0.55 mg/L. The Discharger indicated that it believed the problem leading to these high levels of formaldehyde was related to malfunctioning of the pump that meters out formalin at a specific rate for treatment.

The Basin Plan contains a narrative water quality objective for toxicity that states in part that "[a]*ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life*" (narrative toxicity objective). Aquatic habitat is a beneficial use of the American River. The DFG Pesticide Unit conducted biotoxicity studies to determine the aquatic toxicity of Formalin using *Pimephales promelas* and *Ceriodaphnia dubia* in accordance with the analytical methods specified in 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 *Ceriodaphnia 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 $LC_{50.}$

Results of chronic toxicity tests submitted by the DFG Pesticide Unit indicated *C. dubia* was the most sensitive species with a 7-day No Observable Effect Concentration (NOEC) value of 1.3 mg/L formaldehyde for survival and reproduction. Acute toxicity tests with *C dubia* showed a 96-hour NOAEL of 1.3 mg/L. A summary of the data submitted follows:

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

[1] Survival
[2] Reproduction

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

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

Results of both acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit were considered along with the Basin Plan narrative toxicity objective when determining whether water quality-based effluent limitations for Formalin as formaldehyde were necessary. Results of 7-day chronic toxicity tests indicated *Ceriodaphnia dubia* was the most sensitive species, with a 7-day NOEC value of 1.3 mg/L formaldehyde for survival and < 1.3 mg/L for reproduction (the Regional Board used an NOEC of 1.3 mg/L). Acute toxicity tests conducted using *Ceriodaphnia dubia* showed a 96-hour NOAEL of 1.3 mg/L formaldehyde. The additional acute toxicity tests with *Ceriodaphnia dubia* conduct using only an 8-hour exposure, resulted in a 96-hour NOAEL concentration of 6.7 mg/L formaldehyde. Based on the results of these toxicity tests, past discharges of formaldehyde from the Facility, and the potential for future discharges of formaldehyde from the 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. Effluent concentrations of formaldehyde may persist because of potential application procedures (e.g., successive raceway treatments, drip treatments for eggs) and due to retention of effluent in the settling basins. Accordingly, this Order includes both maximum daily and average monthly water quality-based effluent limitations for formaldehyde.

Order No. 5-00-268 included a maximum daily limitation of 0.03 mg/L for formaldehyde based on a previous California Department of Health Services (DHS) Action Level for Drinking Water. There is no USEPA or California MCL for formaldehyde. Based on the new information from DFG toxicity tests, the lack of an MCL to adequately interpret chemical objectives from the Basin Plan, and to maintain consistency with permit requirements for similar CAAP facilities in the Region, the Regional Board has determined that it is appropriate to revise the formaldehyde limitations in this Order. Both an average monthly effluent limitation of 0.65 mg/L and a maximum daily effluent limitation of 1.3 mg/L were calculated based on the 96-hour NOAEL value and using the procedure in USEPA's TSD for calculating water quality-based effluent limitations. These effluent limitations are included in this Order and have been established for protection of aquatic life against toxic effects from exposure to formaldehyde in the discharge. This change in effluent limitations is consistent with the Federal anti-backsliding provisions of 40 CFR 122.44(l)(1) and 122.62(a)(2).

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

Assuming:

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

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

ECA_a = 1.3 mg/L

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

ECA_c = 1.3 mg/L

Long Term Average concentration based on acute ECA

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

Long Term Average concentration based on chronic ECA

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

Most Limiting LTA concentration

LTA = 0.4173 mg/L

Average Monthly Effluent Limit

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

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

Maximum Daily Effluent Limit

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

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

Sodium Chloride and Calcium Chloride

The Discharger's monthly monitoring reports indicate that sodium chloride (salt) is use on a routine basis. DFG reports that a typical application rate for salt of up to 400 lbs per 3-hour flush treatment in raceway as a fish-cleansing agent to control the spread of fish disease and to reduce stress among the confined fish population. Sodium chloride may also be used in the hatchery building tanks. In the past, the Discharger has used calcium chloride at the Facility. Calcium chloride is used to increase water calcium concentration to ensure proper egg hardening. FDA considers sodium chloride and calcium chloride as unapproved new animal drugs 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. Lack of accurate flow measurements precludes meaningful estimates of sodium chloride or calcium chloride concentrations in the discharge. However, the previous Order included effluent limitations of 125 mg/L for TDS as a daily maximum, based on the site-specific salinity objective from the Basin Plan, and 100 µmhos/cm for conductivity as a 14-day average. The Discharger has monitored effluent from Outfalls 001, 002, and 003 and the receiving water for conductivity and total dissolved solids. Conductivity levels (maximum ranging from 88-100 µmhos/cm) and concentrations of TDS (maximum ranging from 82-102 mg/L) are low in both the effluent and receiving water downstream of the settling ponds. However, because there is no indication that measurements of TDS and conductivity were taken for samples collected during treatment with sodium chloride or calcium chloride at the Facility, the effluent limitation for TDS, based on the site-specific Basin Plan water quality objective, is retained in this Order. The 14-day average limit for conductivity is removed from this Order. This conductivity limitation in the previous Order was not based on a site-specific water quality objective from the Basin Plan. 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 µmhos/cm (Agricultural Water Quality Goal) because it will reduce crop yield for sensitive plants. Thus, an appropriate interpretation of the narrative objective for chemical constituents for conductivity is a limit of 700 µmhos/cm to protect agricultural beneficial uses of the American River. The Agricultural Water Quality Goal for TDS is 450 mg/L. Monitoring data show that conductivity of the Discharge is consistently well below the Agricultural Water Quality Goal. Furthermore, TDS concentration and conductivity levels are related. Retaining the TDS limitation and, thus, controlling TDS in the discharge will control the conductivity level. Removal of the conductivity limitation is consistent with the Federal anti-backsliding provisions of 40 CFR 122.44(l) and 122.62(a). Effluent and receiving water monitoring of both conductivity and TDS is still required, and monthly use of sodium chloride and calcium chloride must be reported as specified in the Monitoring and Reporting Program.

Hydrogen Peroxide

Hydrogen peroxide (35 % H_2O_2) is used periodically at the Facility. Hydrogen peroxide may be used as a short-term immersion bath treatment in holding tanks, or as a raceway flush treatment. FDA considers hydrogen peroxide to be an LRP drug when used to control fungi on fish at all life stages, including eggs. Hydrogen peroxide may also be used under an INAD exemption to control bacterial gill disease in various fish, fungal infections, external bacterial infections, and external parasites. Hydrogen peroxide is a strong oxidizer that breaks down into water and oxygen; however, it exhibits toxicity to aquatic life during the oxidation process. Results of a single acute toxicity test conducted by DFG using *C. dubia* showed a 96-hour NOAEL of 1.3 mg/L. Since there is limited toxicity information available at this time and no information regarding actual discharge concentrations of hydrogen peroxide, this Order does not include 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. 4. The Regional Board will review this information, and other information as it becomes available and this Order may be reopened to establish effluent limitations for hydrogen peroxide based on additional use and toxicity information.

Potassium Permanganate

Potassium permanganate (also known by the trade name of Cairox^{TM}) has been used periodically at the Facility to control gill disease. Potassium permanganate has a low estimated lifetime in the environment, being readily converted by oxidizable materials to insoluble manganese dioxide (MNO_2). In non-reducing and non-acidic environments, MNO_2 is insoluble and has a very low bioaccumulative potential. Potassium permanganate is not approved for use in aquaculture under FDA's NADA program and should therefore be used in accordance with an INAD exemption granted by FDA. Results of a single acute toxicity test using *C. dubia* conducted by DFG showed a 96-hour NOAEL of 0.25 mg/L for potassium permanganate. Since there is limited toxicity information available at this time and no information regarding actual discharge concentrations of potassium permanganate, this Order does not include 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. 4. The Regional Board will review this information, and other information as it becomes available and this Order may be reopened to establish effluent limitations based on additional use and toxicity information.

PVP Iodine

PVP Iodine, a solution composed of 10% PVP iodine complex and 90% inert ingredients, may be used at the Facility in the future as a fish egg disinfectant (fungicide). FDA considers PVP iodine an LRP drug for use in aquaculture. Results of a single acute toxicity test with *Ceriodaphnia dubia* showed a 96-hour NOAEL of 0.86 mg/L. Since there is limited toxicity information available at

this time and no information regarding actual discharge concentrations of PVP iodine, this Order does not include water quality-based effluent limitations for PVP iodine. However, use and monitoring of PVP iodine 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. 4. 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 PVP iodine based on additional use and toxicity information.

Chloramine-T

Chloramine-T is not currently used but may be used by the Discharger in the future as a possible replacement for formalin. Chloramine-T is available for use in accordance with an INAD exemption by FDA. Chloramine-T breaks down into para-toluenesulfonamide (p-TSA) and, unlike other chlorine-based disinfectants, does not form harmful chlorinated compounds. The Regional Board does not have estimates of discharge concentrations of chloramine-T at this Facility. The Discharger has not conducted biotoxicity tests using Chloramine-T, however results of toxicity testing from other sources show a 96-hour LC_{50} for rainbow trout of 2.8 mg/L and a 48-hour NOEC for *Daphnia magna* of 1.8 mg/L (Halamid. n.d. *Halamid, Aquaculture* http://www.halamid.com/aqua.htm). The DFG Pesticide Unit is proposing to conduct additional toxicity testing on Chloramine-T to determine NOAEL concentrations. Since there is limited toxicity information available and no information regarding actual discharge concentrations of chloramine-T, this Order does not include 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. 4 . The Regional Board will review this information, and other information as it becomes available and this Order may be reopened to establish effluent limitations based on additional use and toxicity information.

MS-222 and Aqui-S®

In the future, the Discharger may use the anesthetics tricaine methanesulfonate, commonly known as MS-222 (with trade names of Finquel® or Tricaine-S®) and Aqui-S®. MS-222 has been approved by FDA for use as an anesthetic for Salmonidae. It is intended for the temporary immobilization of fish, amphibians and other aquatic, cold-blooded animals. It has been recognized as a valuable tool for the proper handling of these animals during manual spawning (fish stripping), weighing, measuring, marking, surgical operations, transport, photography, and research. MS-222 is a crystalline powder used as an immersion bath in an enclosed tub. Aqui-S® is a water dispersible liquid anaesthetic for fin fish, crustacea and shell fish and is used in the US under an INAD exemption. The Regional Board does not have specific toxicity information for MS-222 or Aqui-S®or estimates of potential discharge concentrations of MS-222 and Aqui-S®at this Facility. Since there is limited toxicity information available at this time and no information regarding actual discharge concentrations of MS-222 or Aqui-S®, this Order does not include water quality-based effluent limitations for MS-222 or Aqui-S®. However, use and monitoring of MS-222 and Aqui-S® must be reported as specified in the attached Monitoring and Reporting Program and results of

additional toxicity tests must be submitted as specified in Provision No. X. The Regional Board will review this information, and other information as it becomes available and this Order may be reopened to establish effluent limitations based on additional use and toxicity information.

Oxytetracycline and Penicillin G

The hatchery may periodically use the antibiotics oxytetracycline and penicillin G as therapeutic agents in bath treatments to control fish diseases. Bath treatments are used to treat small fish in 600-gallon tanks at 100 ppm (mg/L). The Discharger has estimated the maximum concentration of penicillin G in the discharge from the NFH to be 8 mg/L and the maximum concentration from the ARTH to be significantly lower due to greater dilution. Oxytetracycline may be administered at similar concentrations (100 ppm) and, therefore, similar discharge concentrations would be expected.

Penicillin G, also known as Pen-G, is an antibiotic used in a six to eight hour immersion bath treatment to control acute disease outbreaks and has been used in the past at the Facility. Penicillin G is not approved under FDA's NADA program and its' extra-label use in aquaculture requires a veterinarian's prescription. Due to the length of treatment time (up to eight hours), the Regional Board considered the results of acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limitations for penicillin G were necessary in this Order. Results of acute toxicity tests using *C. dubia* showed a 96-hour NOAEL of 890 mg/L. Results of 7-day chronic toxicity testing using *Pimephales promelas* showed 7-day NOEC for survival of 350 mg/L. The estimated discharge concentration of 8 mg/L of Penicillin G is well below the lowest NOEC and NOAEL. Therefore, at this time, penicillin G when used in an immersion bath treatment, is not discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of a narrative water quality objective for toxicity from the Basin Plans. Accordingly, this Order does not include an effluent limitation for penicillin G. However, monthly use of penicillin G must be reported as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information, and other information as it becomes available, and this Order may be reopened to establish effluent limitations for penicillin G based on additional use and toxicity information.

Oxytetracycline, also known by the brand name Terramycin®, is an antibiotic approved through FDA's NADA program for use in controlling ulcer disease, furunculosis, bacterial hemorrhagic septicemia, and pseudomonas disease in Salmonids. Oxytetracycline is most commonly used at CAAP facilities as a feed additive. However, oxytetracycline may also be used as an extra-label use under a veterinarian's prescription in an immersion bath of approximately six to eight hours in duration. Because Oxytetracycline may be applied in an immersion bath for up to eight hours at a time, the Regional Board considered the results of acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limitations for oxytetracycline used in an immersion bath treatment were necessary in this Order. Results of acute toxicity tests using *C. dubia* showed a 96-hour NOAEL of 40.4 mg/L. Results of chronic toxicity tests using *C. dubia* showed a 7-day NOEC for reproduction of 48 mg/L. The

estimated discharge concentration of 8 mg/L of oxytetracycline is well below the lowest NOEC and NOAEL. Therefore, at this time, oxytetracycline when used in an immersion bath treatment, is not discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of a narrative water quality objective for toxicity from the Basin Plans. Accordingly, this Order does not include an effluent limitation for oxytetracycline. However, monthly use of oxytetracycline must be reported as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information, and other information as it becomes available, and this Order may be reopened to establish effluent limitations for oxytetracycline based on additional use and toxicity information.

Antibiotics in Feed Formulations

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

Acetic Acid, Carbon Dioxide, and Sodium Bicarbonate

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

Vibrio Vaccine and Enteric Redmouth Bacertin

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

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.

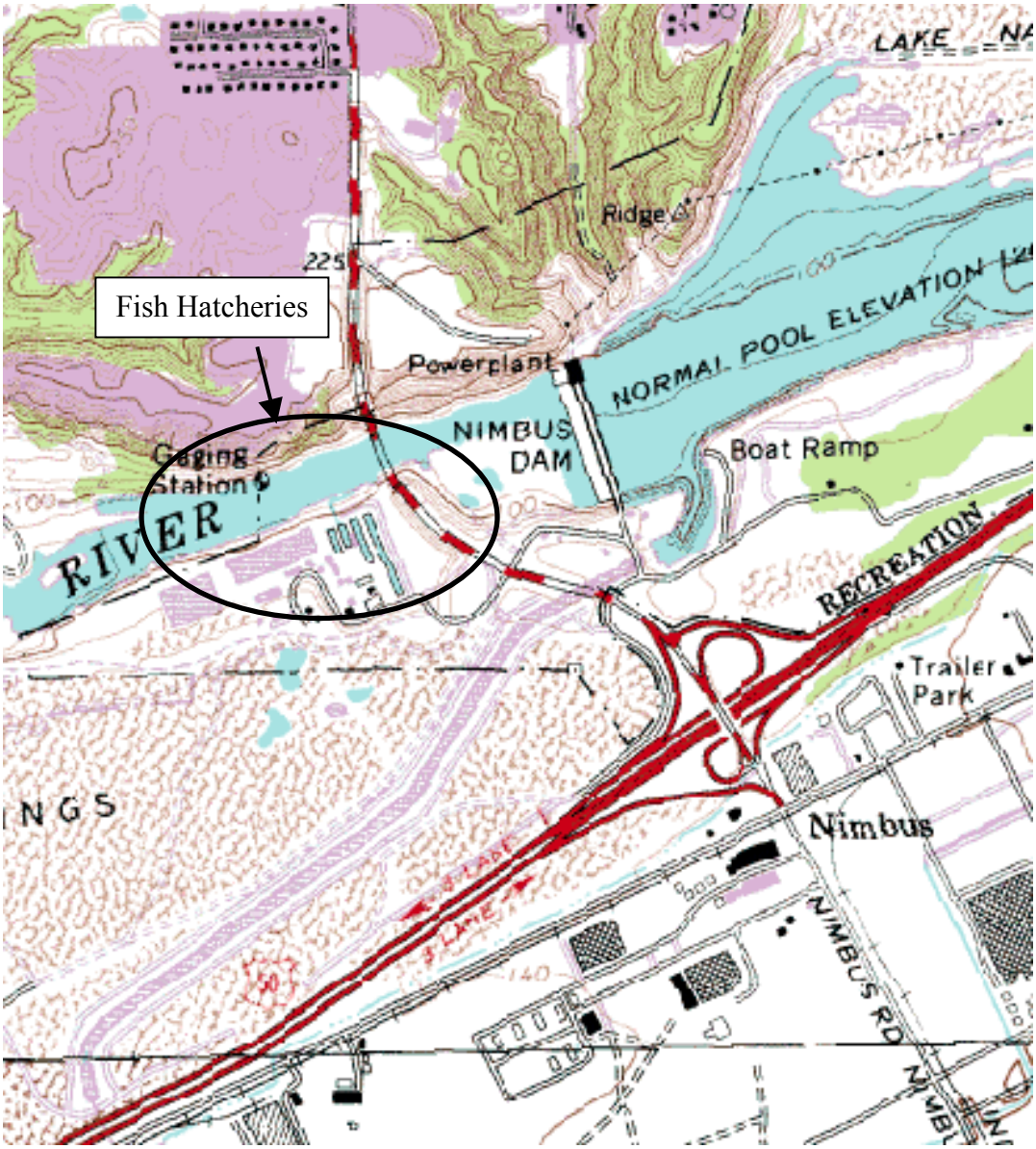
BASIS FOR RECEIVING WATER LIMITATIONS

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

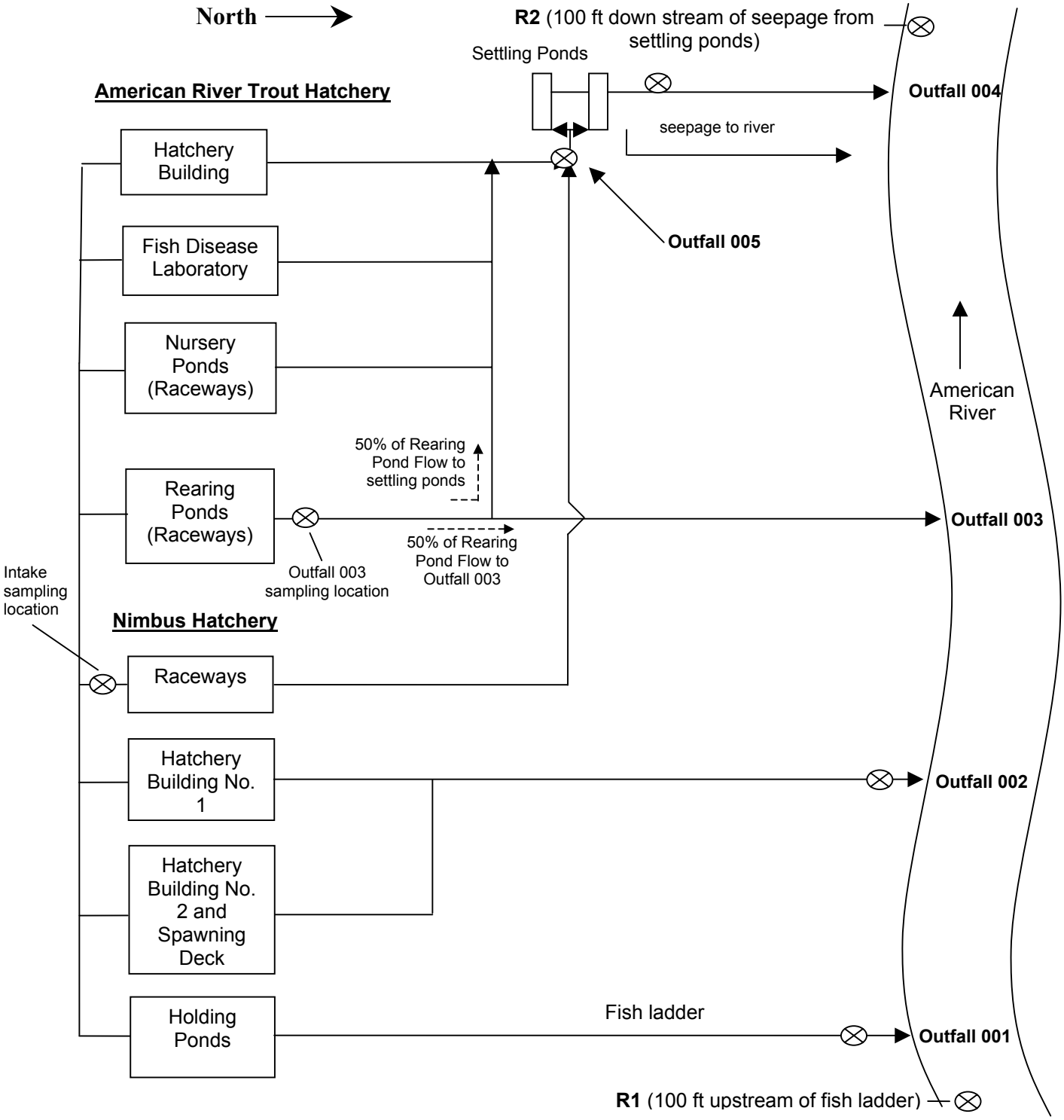
Receiving water monitoring requirements are based on the Basin Plan and authorized by California Water Code Section 13383. Receiving water monitoring requirements are standard requirements in almost all NPDES permits issued by the Regional Board. Upstream receiving water monitoring station R-1 is 100 feet upstream from the Fish Ladder. Downstream receiving water monitoring station R-2 is 100 feet downstream from the seepage points from the settling ponds.

Tt/JME



Drawing Reference: U.S.G.S TOPOGRAPHIC MAPS 7.5 MINUTE QUADRANGLE	**SITE LOCATION MAP** Nimbus Salmon & Steelhead Hatchery and American River Trout Hatchery 2001 Nimbus Road, Rancho Cordova, California Sacramento County T9N, R7E, MDB&M Latitude: N38° 38’ 04’’ Longitude: W121° 13’ 40’’	N W E S approx. scale 1 in. = ¼ mile.

ATTACHMENT B: Water Flow Schematic and Outfall Summary for
Nimbus Salmon & Steelhead Hatchery and American River Trout Hatchery



⊗ = Sampling Location (not to scale)

Outfall Summary

001 – Nimbus Fish Ladder (holding pond overflow ; fresh water, if needed)
002 – Nimbus Hatchery Buildings (water used for egg hatching and incubation) and Spawning Deck (water used during egg removal)
003 – ARTH rearing ponds
004 – Settling Pond Overflow (ARTH rearing ponds; ARTH nursery ponds; Nimbus raceways; fish disease control lab; ARTH hatchery building)
005 – Discharge to Settling Pond – All ARTH rearing pond flow is diverted to settling ponds during cleaning or chemical treatment

ATTACHMENT C

Example SIP Section 1.4 Maximum Daily Effluent Limitations (MDEL's) and Average Monthly Effluent Limitations (AMEL's) for Total Recoverable Copper using CTR Water Quality Hardness-Dependent Values and Basin Plan Site-Specific Objectives for the CCC (Criterion Continuous Concentration) and CTR Values for the CMC (Criterion Maximum Concentration) for the Protection of Freshwater Aquatic Life

Where

Effluent Concentration Allowance (ECA) = total recoverable copper criterion (No Dilution Credit)

*The **MDEL** and **AMEL** for total recoverable copper discharged to the American River shall be calculated using the Coefficient of Variation (CV) and the multipliers in Tables 1 and 2 of the SIP as shown below:*

WATER QUALITY–BASED MDEL and AMEL – American River Discharge	
Copper (Total Recoverable)	
ECA acute	CMC @ Observed Effluent Hardness as $CaCO_3$
ECA chronic	CCC @ Observed Effluent Hardness as $CaCO_3$
Coefficient of Variation (Default)	0.6
LTA (lowest)	Lowest of: (ECA acute ∗ Table 1 Acute Multiplier) or (ECA chronic ∗ Table 1 Chronic Multiplier)
Sampling Frequency (n)	≤ 4
MDEL	(LTA(lowest) ∗ Table 2 MDEL Multiplier)
AMEL	(LTA(lowest) ∗ Table 2 AMEL Multiplier)

*Examples of calculated **MDEL's** and **AMEL's** for total recoverable copper based upon a range of effluent hardness values are shown below:*

Copper expressed as total recoverable, µg/l, Using Coefficient of Variation (CV) of 0.6						
Receiving Water Hardness (mg/L as $CaCO_3$)	ECAc = CCC[1] 4-Day Avg (µg/L)	ECAa =CMC[2] 1-hr Avg (µg/L)	LTA[3] (chronic) (µg/L)	LTA[4] (acute) (µg/L)	**AMEL**[5] (µg/L)	**MDEL**[6] (µg/L)
<20	Must calculate	Must calculate	Must calculate	Must calculate	Must calculate	
20	2.36	3.07	1.24	0.986	1.53	3.07
25	2.85	3.79	1.50	1.22	1.89	3.79
30	3.33	4.50	1.76	1.44	2.24	4.49
35	3.80	5.21	2.00	1.67	2.59	5.20
40	4.26	5.90	2.25	1.90	2.94	5.89
45	4.72	6.60	2.48	2.12	3.28	6.59
50	5.16	7.29	2.72	2.34	3.62	7.27
60	6.03	8.65	3.18	2.78	4.30	8.64
70	6.88	10.0	3.62	3.21	4.98	9.99
≥73	Must calculate	10.4	Must calculate	3.34	5.17	10.4

[1]CCC total recoverable (4-day average) = exp{0.8545[ln(hardness)] – 1.702}
[2]CMC total recoverable (1-hour average) where hardness < 73 mg/L = exp{0.9422[ln(hardness)] – 1.700}
or where hardness > 73 mg/L, CMC total recoverable = 10.4 µg/L
[3]LTA_c (Long-Term Average chronic) = CCC x 0.527
[4]LTA_a (Long-Term Average acute) = CMC x 0.321
[5]AMEL (Average Monthly Effluent Limitation) = LTA (lowest) x 1.55
[6]MDEL (Maximum Daily Effluent Limitation) = LTA (lowest) x 3.11