



California Sportfishing Protection Alliance

"An Advocate for Fisheries, Habitat and Water Quality"

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24 June 2011

Mr. Ken Landau, Assistant Executive Officer
Ms. Diana Messina, Supervising WRCE
Ms. Gayleen Perreira, WRCE
Mr. David Kim, WRCE
Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670-6144

VIA: Electronic Submission
Hardcopy if Requested

RE: Renewal of Waste Discharge Requirements (NPDES No. CA0085146) for Bear Valley Water District Wastewater Treatment Plant, Alpine County

Dear Messrs. Landau, Kim and Mesdames Messina and Perreira,

The California Sportfishing Protection Alliance (CSPA) has reviewed the proposed Waste Discharge Requirements (NPDES No. CA0085146) for Bear Valley Water District Wastewater Treatment Plant (Permit) and submits the following comments.

CSPA requests status as a designated party for this proceeding. CSPA is a 501(c)(3) public benefit conservation and research organization established in 1983 for the purpose of conserving, restoring, and enhancing the state's water quality and fishery resources and their aquatic ecosystems and associated riparian habitats. CSPA has actively promoted the protection of water quality and fisheries throughout California before state and federal agencies, the State Legislature and Congress and regularly participates in administrative and judicial proceedings on behalf of its members to protect, enhance, and restore California's degraded water quality and fisheries. CSPA members reside, boat, fish and recreate in and along waterways throughout the Central Valley, including Alpine County.

- 1. The proposed Permit is based on an incomplete Report of Waste Discharge (RWD) and in accordance with Federal Regulations 40 CFR 122.21(e) and (h) and 124.3(a)(2) the State's Policy for Implementation of Toxics standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP) and California Water Code**

Section 13377 the permit should not be issued until the discharge is fully characterized and a protective permit can be written.

The proposed Permit, page F-19, states that:

“Because no discharges to Bloods Creek have occurred during the term of Order No. R5-2005-0139, the Discharger historically monitored the surface of the aeration pond to characterize the effluent. However, as part of an outfall project completed in 2007, the Discharger installed a sample tap in the equipment house, which is connected to the outfall pipe from the storage/polishing reservoir to Bloods Creek. The intake from the storage/polishing reservoir is a 12-inch high density polyethylene (HDPE) flexible hose attached to a float, designed to keep the intake suspended approximately 4 feet below the surface. This configuration allows for effluent to be drawn from the uppermost zone (i.e., the epilimnion), rather than the lowermost zone (i.e., the hypolimnion), which is of lower quality.

In December 2009, the Discharger began sampling the storage/polishing reservoir from both the surface and the sample tap. Monitoring data collected from these two sampling locations are inconsistent. The Discharger believes that the higher pollutant concentrations observed at the sample tap can be attributed to substrate growth in the effluent pipeline and the use of iron pipe. This contamination is not expected to be observed during an actual discharge event due to the large amount of effluent that would be discharged, compared to the small amount that enters the pipeline during sampling at the sample tap. Due to the possible contamination of effluent samples taken from the sample tap, only monitoring data collected from the surface of the storage/polishing reservoir was used to conduct the RPA. Storage/polishing reservoir data used to conduct the RPA is limited to monitoring from the surface of the storage/polishing reservoir conducted during the 2008, 2009, and 2010 discharge seasons, which included up to 14 samples for certain constituents and one priority pollutant scan.”

The proposed Permit is incorrect throughout the Findings and Fact Sheet by stating that the “effluent” data was used to generate the conditions and limitations; clearly this is not the case as all the utilized sampling was collected at the surface of the storage reservoir. The proposed Permit should be amended to read that sampling from the storage pond surface was used to develop the conditions and limitations. The samples collected at the surface of the storage reservoir are not representative of the discharge or are at a minimum of questionable value based on the following:

- *“The intake from the storage/polishing reservoir is a 12-inch high density polyethylene (HDPE) flexible hose attached to a float, designed to keep the intake suspended*

approximately 4 feet below the surface. This configuration allows for effluent to be drawn from the uppermost zone (i.e., the epilimnion), rather than the lowermost zone (i.e., the hypolimnion), which is of lower quality.” The proposed Permit does not prohibit the discharge from the lower pond levels which exhibit lower quality water. The treatment system design capacity is 0.50 mgd, however a discharge of 2.5 mgd is allowed under the proposed Permit. During the period of discharge, water from the lower pond levels would logically become mixed with the surface water and discharged. There is no possible way for the “lower quality, lower elevation” water to be excluded from the discharge. The sampling from the pond surface only would not be representative of the discharge which was the basis of the proposed Permit. Use of the higher quality pond surface water to develop the proposed Permit would result in an absence of necessary limitations to protect the beneficial uses of the receiving stream.

- The proposed Permit does not specify what constituents were detected when sampling was conducted at the sampling taps that were “unacceptably” high. Since an iron pipe and plastic hose were used; it is possible that iron and phthalate could have been elevated; there would be little defense for discarding sampling for other constituents such as salts, toxic metals or volatile constituents. The proposed Permit should at a minimum have presented the “unrepresentative” sampling results with some defense for discarding each individual constituent result.
- Density = Mass/Volume. If mass is increased but the volume is not then the density increases. Salt dissolves in water so it adds to the mass but not to the volume therefore increasing the density. The proposed Permit ignores the fact that saline waters are heavier and would naturally sink to the bottom of the pond. The proposed Permit is incorrect and incomplete with regard to the Reasonable Potential Analysis for EC, TDS and chloride since the conducted sampling would have eliminated the high salinity water from the analysis.
- Toxic dissolved metals would also increase the density of water causing the higher concentration of metal laden water to sink to the bottom of the pond. Obviously, total or particulate metals would be heavier than water and would also be found nearer to the bottom of the pond.
- Hardness (calcium carbonate), as with salinity, would increase the density of water and the higher concentrations would be found at the bottom of a pond or reservoir. The proposed Permit utilized the hardness of the water collected at the pond surface to develop limitations for toxic metals. Since this hardness is not likely representative of the discharge or the total volume pond volume; the upstream ambient hardness would appropriately be recorded as the lowest observed hardness which is the appropriate

hardness to use in the reasonable potential analysis. The proposed Permit also ignores the fact that domestic sewage hardness levels are higher than a communities drinking water source supply; it is highly unlikely that the wastewater hardness could be as low as 6.9 mg/l.

- Dissolved oxygen may be absent at the lower depths of the pond depending on the total pond depth. The dissolved oxygen levels in the discharge were ignored in the reasonable potential analysis for developing Effluent Limitations.
- Chlorine is volatile and would be neared the pond surface where the sampling was conducted. There is no information that the samples were dechlorinated; the chlorine concentration could have suppressed BOD levels in samples collected from the pond surface.
- Settleable solids, by definition, would have settled to the lower depths of the pond and would have been excluded from the samples collected from the pond surface.
- The proposed Permit, page F-47, states that: *“Chronic aquatic toxicity. The basin plan contains a narrative toxicity objective that states, “all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.” (basin plan at page iii-8.00). Two chronic toxicity tests were conducted during the term of order no. R5-2005-0139 in june 2007 and july 2009. The june 2007 testing event did not indicate that the discharge was toxic. The july 2009 testing event did indicate impacts to ceriodaphnia dubia reproduction. However, the july 2009 testing event may not be representative of potential discharge conditions, as it was conducted outside the discharge period of 1 january through 30 june, there was minimal flow in bloods creek, the influent sampler was used to collect samples, and the storage/polishing reservoir was experiencing an algae bloom that had to be filtered from the samples. Therefore, adequate chronic toxicity data is not available to determine if the discharge has reasonable potential to cause or contribute to an in-stream excursion above the basin plan’s toxicity objective.” (Underline emphasis added)*
The proposed Permit acknowledges that the wastewater discharge has not been adequately characterized to develop limitations to protect water quality and the beneficial uses of the receiving stream.
- Chlorination is provided following the aeration pond and prior to the storage pond. It is highly unlikely that the effluent discharge from the storage pond would be capable of meeting the proposed Permit limitation for total coliform organisms, unless chlorine residual is maintained in the storage pond above toxic levels. Coliform organisms will be added to the storage pond by birds, other animals and even from the soils. Few surface

waters could meet a 23 MPN/100 ml coliform standard which is necessary to adequately disinfect sewage to a secondary level as prescribed by DPH. The sampling collected from the surface of the storage pond is either incorrect or large concentrations of toxic chlorine reside in the storage pond. The sampling used to develop the proposed Permit is not representative of the discharge that will occur to surface waters.

- A recent study by the Toxic Substances Hydrology Program of the U.S. Geological Survey (USGS) shows that a broad range of chemicals found in residential, industrial, and agricultural wastewaters commonly occurs in mixtures at low concentrations downstream from areas of intense urbanization and animal production. The chemicals include human and veterinary drugs (including antibiotics), natural and synthetic hormones, detergent metabolites, plasticizers, insecticides, and fire retardants. One or more of these chemicals were found in 80 percent of the streams sampled. Half of the streams contained 7 or more of these chemicals, and about one-third of the streams contained 10 or more of these chemicals. This study is the first national-scale examination of these organic wastewater contaminants in streams and supports the USGS mission to assess the quantity and quality of the Nation's water resources. A more complete analysis of these and other emerging water-quality issues is ongoing. Knowledge of the potential human and environmental health effects of these 95 chemicals is highly varied; drinking-water standards or other human or ecological health criteria have been established for 14. Measured concentrations rarely exceeded any of the standards or criteria. Thirty-three are known or suspected to be hormonally active; 46 are pharmaceutically active. Little is known about the potential health effects to humans or aquatic organisms exposed to the low levels of most of these chemicals or the mixtures commonly found in this study. ("Pharmaceuticals, hormones, and other organic wastewater contaminants in U.S. streams, 1999-2000: A national reconnaissance," an article published in the March 15, 2002 issue of *Environmental Science & Technology*, v. 36, no. 6, pages 1202-1211. Data are presented in a companion USGS report, "Water-quality data for pharmaceuticals, hormones, and other organic wastewater contaminants in U.S. streams, 1999-2000" (USGS Open-File Report 02-94). These and other reports, data, and maps can be accessed on the Internet at <http://toxics.usgs.gov>.)

These chemicals are found where people or animals are treated with drugs and people use personal care products. Such chemicals are found in any water body influenced by raw or treated sewage, including rivers, streams, ground water, coastal marine environments, and many drinking water sources. Toxic chemicals have been identified in most places sampled. The US geological survey (USGS) implemented a national reconnaissance to provide baseline information on the environmental occurrence of toxic chemicals in water resources. The proposed Permit fails to require any assessment of "constituents of emerging concern despite that drinking water intakes are located downstream and aquatic

life is a beneficial use of the receiving stream.

Sampling from the surface of the storage pond is not representative of the total discharge. Such sampling would contain significantly lower pollutant concentrations than the total combined discharge. The proposed permit which is based on this faulty sampling cannot be protective of the beneficial uses of the receiving stream. The proposed Permit acknowledges that water from the “*hypolimnion which is of lower quality*” layer of the pond was excluded from consideration in developing the permit. The proposed Permit was not based on sampling that characterized the total wastewater discharge.

EPA established the CTR in May of 2000 (Federal Register / Vol. 65, No. 97 / Thursday, May 18, 2000 / Rules and Regulations, Environmental Protection Agency 40 CFR Part 131, Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California) which promulgates: numeric aquatic life criteria for 23 priority toxic pollutants; numeric human health criteria for 57 priority toxic pollutants; and a compliance schedule provision which authorizes the State to issue schedules of compliance for new or revised National Pollutant Discharge Elimination System permit limits based on the federal criteria when certain conditions are met. Section 3, *Implementation*, requires that once the applicable designated uses and water quality criteria for a water body are determined, under the National Pollutant Discharge Elimination System (NPDES) program discharges to the water body must be characterized and the permitting authority must determine the need for permit limits. If a discharge causes, has the reasonable potential to cause, or contributes to an excursion of a numeric or narrative water quality criteria, the permitting authority must develop permit limits as necessary to meet water quality standards. These permit limits are water quality-based effluent limitations or WQBELs. The terms “cause,” “reasonable potential to cause,” and “contribute to” are the terms in the NPDES regulations for conditions under which water quality based permit limits are required (See 40 CFR 122.44(d)(1)).

The SWRCB adopted the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP) to implement the CTR. Section 1.2 Data Requirements and Adjustments, of the SIP requires that it is the discharger’s responsibility to provide all data and other information requested by the RWQCB before the issuance, reissuance, or modification of a permit to the extent feasible. When implementing the provisions of this Policy, the RWQCB shall use all available, valid, relevant, representative data and information, as determined by the RWQCB.

The SIP required the Regional Board’s to require dischargers to characterize their discharges for priority pollutants. On 10 September 2001, the Regional Board mailed out a California Water Code Section 13267 letter to dischargers requiring a minimum of quarterly sampling for priority pollutants, pesticides, drinking water constituents, and other pollutants. The Regional Board’s

13267 letter cited SIP Section 1.2 as directing the Board to issue the letter requiring sampling sufficient to determine reasonable potential for priority pollutants and to calculate Effluent Limitations. The Regional Board's 13267 letter went beyond requiring sampling for CTR and NTR constituents and required a complete assessment for pesticides, drinking water constituents, temperature, hardness and pH and receiving water flow. The proposed Permit however states that it was developed based on only one sample analyzed for priority pollutants. Even if the sample had been collected from an appropriate and representative location, which it was not, one sample over a five year period, when the Regional Board required a minimum of 4 samples, is simply deficient.

SIP Section 1.3 requires that the Regional Board conduct a reasonable potential analysis for each priority pollutant to determine if a water quality-based Effluent Limitation is required in the permit. Absent representative data, the Regional Board cannot possibly comply with SIP requirement of Section 1.3. Federal Regulation 40 CFR 124.8 (A)(2) requires Fact Sheets contain an assessment of the wastes being discharged; this has not been presented in the proposed Fact Sheet.

Federal Regulation, 40 CFR 122.21(e) states in part that: "The Director shall not issue a permit before receiving a complete application for a permit except for NPDES general permits. In accordance with 40 CFR 122.21 (e) and (h) and 124.3 (a)(2) the Regional Board shall not adopt the proposed permit without first a complete application. An application for a permit is complete when the Director receives an application form and any supplemental information which are completed to his or her satisfaction. The completeness of any application for a permit shall be judged independently of the status of any other permit application or permit for the same facility or activity."

State Report of Waste Discharge form 200 is required as a part of a complete Report of Waste Discharge. Form 200, part VI states that: "To be approved, your application must include a complete characterization of the discharge." The Federal Report of Waste Discharge forms also require a significant characterization of a wastewater discharge. This has not been completed.

As the proposed Permit states, the California Toxics Rule (CTR)(40 CFR 131, Water Quality Standards) contains water quality standards applicable to this wastewater discharge. The final due date for compliance with CTR water quality standards for all wastewater dischargers in California is May 2010. The State's *Policy for Implementation of Toxics standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (SIP), Section 1.2, requires wastewater dischargers to provide all data and other information requested by the Regional Board before the issuance, reissuance, or modification of a permit to the extent feasible.

Federal Regulation, 40 CFR 122.21(e) states in part that: “The Director shall not issue a permit before receiving a complete application for a permit except for NPDES general permits.

California Water Code, section 13377, requires that: “Notwithstanding any other provision of this division, the state board and the regional boards shall, as required or authorized by the Federal Water Pollution Control Act, as amended, issue waste discharge and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with any more stringent effluent standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.”

The application for permit renewal is incomplete and the information utilized to write the proposed Permit is incorrect, and in accordance with the CWC, Federal Regulations and the SIP the proposed Permit should not be adopted.

2. The proposed Permit fails to include an Effluent for dissolved oxygen (DO) as required by Federal Regulations 40 CFR 122.44 and the permit should not be adopted in accordance with California Water Code Section 13377.

Federal Regulations, 40 CFR 122.44 (d)(i), requires that; “Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.” The Water Quality Standard for dissolved oxygen as presented in the Basin Plan and as cited in the proposed Permit, Receiving Water Limitations No. 7 is 7 mg/l. The wastewater discharge was not sampled for dissolved oxygen or is not reported as such in the proposed Permit. Pond systems dissolved oxygen levels change throughout the day based on the presence of oxygen demanding substances. Dissolved oxygen levels are at their lowest during the early morning hours for normally operating ponds. Oxygen is used by bacteria and algae in a pond system for respiration and to oxidize organic molecules. The proposed Permit, page F-47, states that: “*However, the July 2009 testing event may not be representative of potential discharge conditions, as it was conducted outside the discharge period of 1 January through 30 June, there was minimal flow in Bloods Creek, the influent sampler was used to collect samples, and the storage/polishing reservoir was experiencing an algae bloom that had to be filtered from the samples.*” The storage pond contains organic matter that will oxidize utilize oxygen, bacteria that breakdown waste constituents and utilize oxygen and as cited in the permit is subject to algae blooms. There is no indication that the wastewater has been characterized for dissolved oxygen levels and particularly during the early morning hours at dawn when DO levels would be expected to be at their lowest. Instead the storage pond was sampled at the water’s surface where DO levels would be at their highest due to mixing with

the atmosphere and there is no indication in the proposed Permit that DO levels were sampled at all. As is stated above, the wastewater discharge has not been adequately characterized. It is reasonable, based on the available facts that wastewater discharge presents a reasonable potential to exceed the water quality objective for DO. The proposed Order fails to establish an effluent limitation for DO.

California Water Code, section 13377, requires that: “Notwithstanding any other provision of this division, the state board and the regional boards shall, as required or authorized by the Federal Water Pollution Control Act, as amended, issue waste discharge and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with any more stringent effluent standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.”

3. The proposed Permit fails to include an Effluent for pH as required by Federal Regulations 40 CFR 122.44 and the permit should not be adopted in accordance with California Water Code Section 13377.

Federal Regulations, 40 CFR 122.44 (d)(i), requires that; “Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.” The Water Quality Standard for pH is that pH not be depressed below 6.5 nor raised above 8.5 pH units. The wastewater discharge ranged in pH from 4.85 to 10.3 pH units.

The Regional Board attempts to use an equation derived for conservative constituents to determine a reasonable potential for pH. For example, salt is a conservative constituent, a pound of salt will remain a pound of salt. However, pH is not a conservative constituent. The pH measured at one point in a water body may change for a variety of environmental reasons. The Regional Board’s use of an equation for conservative constituents to determine reasonable potential is not appropriate for pH.

The proposed Permit, page F-69 states that: *“pH Requirement. The secondary treatment regulations at 40 CFR Part 133 require that pH be maintained between 6.0 and 9.0 standard units (see Section IV.B of the Fact Sheet for more details). This Order requires compliance with the federal secondary treatment regulations after secondary treatment is conducted. Therefore, this Order requires compliance at the discharge from the Treatment Pond into the storage/polishing reservoir. The pH data measured from samples collected in the storage/polishing reservoir indicate high variability, ranging from 4.42 to 10.3. The Discharger*

attributes these fluctuations to the low alkalinity of the water in the reservoir due to rainfall, snowmelt, and I/I that allows for substantial increases in pH with comparatively little algae growth and photosynthesis, and the natural acidity of the geologic features in concert with depressed pH resulting from acidic precipitation. The federal secondary treatment regulations are technology-based standards for secondary treatment, therefore, it is appropriate to apply the standard at the discharge from the Treatment Pond, not for discharges from the storage/polishing reservoir.” The Federal regulations address possible changes to BOD and TSS for equivalent to secondary treatment processes based on achieving significant biological reduction of pollutant loads. The Federal regulations do not provide any such allowance for pH. The Regional Board has not provided any technical or legal justification for deviating away from the federal requirement that the “effluent” pH be maintained between 6.5 and 9.0.

The proposed Permit goes on to state that: *“The discharge pH ranged from 4.85 to 10.3 and the upstream receiving water pH ranged from 5.18 and 7.0. Using Equation 5, the critical downstream receiving water pollutant concentration for pH ranges from 5.2 to 7.2. Based on this evaluation, there is clearly no reasonable potential for the discharge to cause or contribute to an exceedance of the upper pH water quality objective of 8.5. However, the minimum pH is below the lower pH water quality objective. The pH of Bloods Creek is naturally low due to the geologic formations in the area and this Order requires a minimum of 20:1 dilution. Therefore, additional evaluation is needed to determine if the discharge has reasonable potential to cause or contribute to an exceedance of the objective. Due to the large dilution, the discharge has little impact on the pH of Bloods Creek. The maximum impact the discharge has on lowering pH in Bloods Creek is only 0.1 pH units. Based on this insignificant impact, the discharge does not have reasonable potential to cause or contribute to an exceedance of the lower pH water quality objective. Therefore, water quality-based effluent limitations are not needed for pH. However, this Order includes a receiving water limitation for pH.”*

Recall that the wastewater has not been characterized for the worst case conditions and has only been sampled at the surface of the storage pond. There is also no information in the Permit that would indicate that the pH has been sampled in the early morning when levels would be expected to be at their lowest.

The receiving stream exceeds the low end of the water quality objective range having been sampled at 5.18 pH units. The wastewater discharge was sampled as low as 4.85 pH units. The Regional Board states that the pH of the discharge only lowers the receiving stream by 0.1 pH unit. This can only be done if mixing within the receiving stream is considered and if one assumes that pH is a conservative parameter (which it is not). Again, the Regional Board attempts to use a mass balance equation to predict what a pH level will be downstream which is inappropriate for a non-conservative constituent. The Central Valley Regional Water Quality Control Board’s Basin Plan, page IV-16.00, requires the Regional Board use EPA’s *Technical*

Support Document for Water Quality Based Toxics Control (TSD) in assessing mixing zones. The TSD, page 70, defines a first stage of mixing, close to the point of discharge, where complete mixing is determined by the momentum and buoyancy of the discharge. The second stage is defined by the TSD where the initial momentum and buoyancy of the discharge are diminished and waste is mixed by ambient turbulence. The TSD goes on to state that in large rivers this second stage mixing may extend for miles. The TSD, Section 4.4, requires that if complete mix does not occur in a short distance mixing zone monitoring and modeling must be undertaken. The Regional Board has not conducted any mixing zone analysis for pH and has not considered the water quality impacts of very low pH within the area where mixing occurs.

US EPA issued Quality Criteria for water in 1976 for pH. The criteria state in part that:

- “The pH range which is not directly lethal to fish is 5 – 9; however, the toxicity of several common pollutants is markedly affected by pH changes within this range, and increasing acidity or alkalinity may make these poisons more toxic.”
- “Based on present evidence, a pH range of 6.5 to 9.0 appears to provide adequate protection for the life of freshwater fish and bottom dwelling invertebrates fish food organisms. Outside this range, fish suffer adverse physiological effects increasing in severity as the degree of deviation increases until lethal levels are reached.”

The Regional Board failed to assess the impacts to aquatic life within the area where the wastewater mixes with the receiving stream. According to US EPA’s criteria these impacts could be significantly detrimental to aquatic life (a zone of death).

It is also amazing that the Regional Board can assess that a change in pH of 0.1 pH units outside the mixing zone is insignificant, which is contrary to US EPA’s assessment that adverse effects to aquatic life will occur outside the range of 6.5 to 9.0 pH units. The Regional Board cites no scientific evidence in stating that a pH shift of 0.1 pH units is insignificant. The Regional Board’s assessment of insignificance is dangerous to the protection of freshwater aquatic life.

Clearly the discharge with pH ranges from 4.85 to 10.3 exceeds the water quality objective for pH of within the range from 6.5 to 8.5. The proposed Order fails to establish an effluent limitation for pH.

California Water Code, section 13377, requires that: “Notwithstanding any other provision of this division, the state board and the regional boards shall, as required or authorized by the Federal Water Pollution Control Act, as amended, issue waste discharge and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with any more stringent effluent

standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.”

4. The proposed Permit fails to include an Effluent for color as required by Federal Regulations 40 CFR 122.44 and the permit should not be adopted in accordance with California Water Code Section 13377.

Federal regulations, 40 CFR 122.44 (d)(i), requires that; “limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality.” The proposed permit, page f-47, states that: “*however, the July 2009 testing event may not be representative of potential discharge conditions, as it was conducted outside the discharge period of 1 January through 30 June, there was minimal flow in bloods creek, the influent sampler was used to collect samples, and the storage/polishing reservoir was experiencing an algae bloom that had to be filtered from the samples.*” The Basin Plan Chemical Constituents incorporates drinking water maximum contaminant levels (MCLs) from CCR Title 22. Title 22 contains a drinking water MCL for color of 15 units. Pond systems are known for algae growth which discolors the water. In addition to the drinking water standard, color in water can reduce light penetration and thereby reduce photosynthesis restricting vascular plant growth. The proposed permit contains no limits for color and no sampling to determine if the drinking water beneficial use is being protected. The wastewater characterization also did not assess the impacts of color. The proposed permit contains no information that the discharge will not cause exceedance of the color MCL and monitoring for color is not required. The proposed permit is simply not protective of the drinking water beneficial use.

Based on the presence of algae blooms in the pond system the discharge can reasonably be expected to exceed the water quality objective for color. The proposed Order fails to establish an effluent limitation for color.

California Water Code, section 13377, requires that: “Notwithstanding any other provision of this division, the state board and the regional boards shall, as required or authorized by the Federal Water Pollution Control Act, as amended, issue waste discharge and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with any more stringent effluent standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.”

5. The proposed Permit, based on a secondary level of treatment, will likely be violated for the requirement that 85% of the BOD and TSS be removed from the wastestream.

The proposed Permit contains an Effluent Limitation (b) requiring that: *“Percent Removal. The average monthly percent removal of BOD₅ and TSS shall not be less than 85 percent.”* The treatment system is an aerated pond system followed by a storage pond. The proposed Permit documents that the influent is diluted by I/I and that algae blooms occur within the storage pond. This situation is not uncommon in the Central Valley however many of such systems have been granted “equivalent to secondary treatment” limitations where the percent removal has been adjusted based on two years of normal operation. Such is not possible here since the facility was designed for land disposal and a surface water discharge is not “normal”. This situation is complicated by the fact that the Discharger has been sampling at the water surface within the storage pond which is not representative of the wastewater discharge. Once the actual effluent discharge is sampled, it is unlikely that the secondary treatment requirements will be met.

6. The proposed Permit fails to contain mass-based effluent limits for copper, lead and aluminum as required by Federal Regulations 40 CFR 122.45(b).

Federal Regulation, 40 CFR 122.45 (b) requires that in the case of POTWs, permit Effluent Limitations, standards, or prohibitions shall be based on design flow.

Concentration is not a basis for design flow. Mass limitations are concentration multiplied by the design flow and therefore meet the design flow regulatory requirement. Mass limits are critically important to assure that the facility is properly designed and capable of removing individual pollutants and to assure that the treatment facilities are not overloaded with the individual pollutant. The Regional Board’s approach to priority pollutants is that treatment plants are designed to remove BOD, TSS and pathogens and that the removal of other priority pollutants is incidental; hence their removal of mass limitations from permits. This approach may have been generally successful prior to adoption of the National and California Toxics Rules which established stringent numerical limitations for priority pollutants. It is easy to recognize the failure of relying on conventional treatment plant design for addressing priority pollutants by the number of Time Schedule Orders and Cease and Desist Orders for noncompliant treatment systems regulated by the Central Valley Regional Board. This is also evidenced by the number of NTR and CTR noncompliant wastewater treatment plants in California’s Central Valley. The design flow for priority pollutants is different for each individual pollutant and is different again from the conventional design flow for BOD and TSS. The treatment plant design flow for BOD and TSS removal is not the design flow rate for individual priority pollutants and toxic constituents such as copper, lead, ammonia and aluminum. A prime example of the requirements for individual pollutant removal is ammonia

removal or nitrification; the design of activated sludge systems has been modified from simply being designed for BOD removal to achieve nitrification in many cases by providing extended aeration. This is likely why the proposed Permit contains mass limits for ammonia. Failure to include mass limits and design flows for priority pollutants maintains the incidental nature of past compliance and will not reliably achieve compliance with water quality standards for priority pollutants. For copper, lead and aluminum the proposed Permit does not specify the design flow and does therefore not comply with the requirements of 40 CFR 122.45(b).

Section 5.7.1 of U.S. EPA's *Technical Support Document for Water Quality Based Toxics Control* (TSD, EPA/505/2-90-001) states with regard to mass-based Effluent Limits:

“Mass-based effluent limits are required by NPDES regulations at 40 CFR 122.45(f). The regulation requires that all pollutants limited in NPDES permits have limits, standards, or prohibitions expressed in terms of mass with three exceptions, including one for pollutants that cannot be expressed appropriately by mass. Examples of such pollutants are pH, temperature, radiation, and whole effluent toxicity. Mass limitations in terms of pounds per day or kilograms per day can be calculated for all chemical-specific toxics such as copper, lead and aluminum.

Federal Regulations, 40 CFR 122.45 (f), states the following with regard to mass limitations:

- “(1) all pollutants limited in permits shall have limitations, standards, or prohibitions expressed in terms of mass except:
- (i) For pH, temperature, radiation or other pollutants which cannot be expressed by mass;
 - (ii) When applicable standards and limitations are expressed in terms of other units of measurement; or
 - (iii) If in establishing permit limitations on a case-by-case basis under 125.3, limitations expressed in terms of mass are infeasible because the mass of the pollutant discharged cannot be related to a measure of operation (for example, discharges of TSS from certain mining operations), and permit conditions ensure that dilution will not be used as a substitute for treatment.

(2) Pollutants limited in terms of mass additionally may be limited in terms of other units of measurement, and the permit shall require the permittee to comply with both limitations.”

In addition to the above citations, on June 26th 2006 U.S. EPA, Mr. Douglas Eberhardt, Chief of the CWA Standards and Permits Office, sent a letter to Dave Carlson at the Central Valley Regional Water Quality Control Board strongly recommending that NPDES permit effluent limitations be expressed in terms of mass as well as concentration.

It should be noted that the Regional Board does a great disservice to the Dischargers it regulates when they allow new or expanded treatment system to be built that are in immediate noncompliance with discharge limitations; this can be remedied by requiring the submittal of individual pollutant design parameters be submitted by the design engineers. The proposed Permit must be amended to include mass limitations for copper, lead and aluminum. The design flow for each of the listed pollutants should be individually specified in the proposed Permit to confirm compliance with 40 CFR 122.45(b). Failure to include mass limitations for these pollutants will result in another inadequately designed treatment plant that will be noncompliant for the listed pollutants. The proposed Permit goes even further down the road to noncompliance by reducing the level of treatment from tertiary to secondary. Tertiary treatment systems have difficulty meeting limitations for metals; the required secondary system will continue to fail to meet limitations for these pollutants. Mass limitations must be included in the proposed Permit for copper, lead and aluminum.

7. The proposed Permit does not contain Effluent Limitations for chronic toxicity and therefore does not comply with Federal regulations, at 40 CFR 122.44 (d)(1)(i) and the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP).

Domestic wastewater treatment plants, by their nature, contain numerous toxic constituents and present a reasonable potential to exceed the Basin Plan's narrative Toxicity water quality objective. Even a well maintained and operated wastewater treatment plant can experience upsets and bypass resulting in toxic discharges. Infrequent, monthly or quarterly, toxicity testing is not sufficient to state that a domestic wastewater treatment plant has not discharged toxic constituents in toxic concentrations during a five year life of an NPDES permit.

Ammonia, for example, is one of the most readily available toxic pollutants and this facility cannot meet the proposed Effluent Limitation for ammonia. The proposed permit effluent Limitation for ammonia is based on protecting against toxicity to aquatic life. The presence of ammonia in the discharge above the water quality objective presents a reasonable potential to cause toxicity.

Copper is another aquatic toxic pollutant in the discharge above levels prescribed in the CTR as necessary to protect aquatic life. The presence of copper above the CTR aquatic life criteria presents a reasonable potential to cause toxicity.

Aluminum in the discharge exceeds the US EPA recommended criteria for the protection of freshwater aquatic life. The presence of aluminum above the recommended criteria presents a reasonable potential to cause toxicity.

The discharge has been measured for pH values far outside the Basin Plan Water quality Objective range of 6.5 to 8.5. pH outside the prescribed range has been shown to be toxic to freshwater aquatic life. The discharge of wastewater outside the Basin Plan prescribed range for pH presents a reasonable potential to cause toxicity.

Proposed Permit, State Implementation Policy states that: “Requirements of this Order implement the SIP.” The SIP, Section 4, Toxicity Control Provisions, Water Quality-Based Toxicity Control, states that: “A chronic toxicity effluent limitation is required in permits for all dischargers that will cause, have a reasonable potential to cause, or contribute to chronic toxicity in receiving waters.” The SIP is a state *Policy* and CWC Sections 13146 and 13247 require that the Board in carrying out activities which affect water quality shall comply with state policy for water quality control unless otherwise directed by statute, in which case they shall indicate to the State Board in writing their authority for not complying with such policy.

Federal regulations, at 40 CFR 122.44 (d)(1)(i), require that limitations must control all pollutants or pollutant parameters which the Director determines are or may be discharged at a level which will cause, or contribute to an excursion above any State water quality standard, including state narrative criteria for water quality. There has been no argument that domestic sewage contains toxic substances and presents a reasonable potential to cause toxicity if not properly treated and discharged. The Water Quality Control Plan for the Sacramento/ San Joaquin River Basins (Basin Plan), Water Quality Objectives (Page III-8.00) for Toxicity is a narrative criteria which states that all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. The Proposed Permit states that: “...to ensure compliance with the Basin Plan’s narrative toxicity objective, the discharger is required to conduct whole effluent toxicity testing...”. However, sampling does not equate with or ensure compliance. The Tentative Permit requires the Discharger to conduct an investigation of the possible sources of toxicity if a threshold is exceeded. This language is not a limitation and essentially eviscerates the Regional Board’s authority, and the authority granted to third parties under the Clean Water Act, to find the Discharger in violation for discharging chronically toxic constituents. An effluent limitation for chronic toxicity must be included in the Order. In addition, the Chronic Toxicity Testing Dilution Series should bracket the actual dilution at the time of discharge, not use default values that are not relevant to the discharge.

Proposed Permit is quite simply wrong; by failing to include effluent limitations prohibiting chronic toxicity the proposed Permit does not “...implement the SIP”. The Regional Board has commented time and again that no chronic toxicity effluent limitations are being included in NPDES permit until the State Board adopts a numeric limitation. The Regional Board explanation does not excuse the proposed Permit’s failure to comply with Federal Regulations,

the SIP, the Basin Plan and the CWC. The Regional Board's Basin Plan, as cited above, already states that: "...waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses..." Accordingly, the proposed Permit must be revised to prohibit chronic toxicity (mortality and adverse sublethal impacts to aquatic life, (sublethal toxic impacts are clearly defined in EPA's toxicity guidance manuals)) in accordance with Federal regulations, at 40 CFR 122.44 (d)(1)(i) and the Basin Plan and the SIP.

8. The proposed permit contains an inadequate reasonable potential by using incorrect statistical multipliers for aluminum, ammonia, nitrate, electrical conductivity, total dissolved solids, chlorine and manganese as required by Federal regulations, 40 CFR § 122.44(d)(1)(ii). The proposed Permit fails to include an Effluent Limitation for total dissolved solids as required by 40 CFR 122.44.

Federal regulations, 40 CFR § 122.44(d)(1)(ii), state "when determining whether a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard, the permitting authority shall use procedures which account for existing controls on point and nonpoint sources of pollution, **the variability of the pollutant or pollutant parameter in the effluent**, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity), and where appropriate, the dilution of the effluent in the receiving water." Emphasis added. The reasonable potential analysis fails to consider the statistical variability of data and laboratory analyses as explicitly required by the federal regulations. The proposed Permit states that: "The Regional Water Board conducted the RPA in accordance with Section 1.3 of the SIP. Although the SIP applies directly to the control of CTR priority pollutants, the State Water Board has held that the Regional Water Board may use the SIP as guidance for water quality-based toxics control. The SIP states in the introduction *"The goal of this Policy is to establish a standardized approach for permitting discharges of toxic pollutants to non-ocean surface waters in a manner that promotes statewide consistency."* Therefore, in this Order the RPA procedures from the SIP were used to evaluate reasonable potential for both CTR and non-CTR constituents." The procedures for computing variability are detailed in Chapter 3, pages 52-55, of USEPA's *Technical Support Document For Water Quality-based Toxics Control*. The Regional Water Board conducted the RPA in accordance with Section 1.3 of the SIP. The proposed Permit states that: "Although the SIP applies directly to the control of CTR priority pollutants, the State Water Board has held that the Regional Water Board may use the SIP as guidance for water quality-based toxics control" but fails to discuss compliance with 40 CFR § 122.44(d)(1)(ii). The State and Regional Boards do not have the authority to override and ignore federal regulation. A statistical analysis results in a projected maximum effluent concentration (MEC) based on laboratory variability and the resulting MEC is greater than was obtained from the actual sampling data. The result of using statistical variability is that a greater number of constituents will have a reasonable potential to exceed water quality standards and therefore a permit will have a greater number of effluent

limitations. The intentional act of ignoring the Federal regulation has a clear intent of limiting the number of regulated constituents in an NPDES permit. The fact that the SIP illegally ignores this fundamental requirement does not exempt the Regional Board from its obligation to consider statistical variability in compliance with federal regulations. The failure to utilize statistical variability results in significantly fewer Effluent Limitations that are necessary to protect the beneficial uses of receiving waters. While some of the cited non-priority pollutants did show reasonable potential without a proper statistical variability analysis; the variability analysis should be conducted to present a clear picture of the problems with the discharge and to comply with the regulatory requirements. The reasonable potential analyses for CTR constituents are flawed and must be recalculated.

Total dissolved solids (TDS) were measured at the surface of the storage pond as high as 378 mg/l. The agricultural goal for TDS is 450 mg/l and the secondary drinking water MCL, as included in the Basin Plan is 500 mg/l. The proposed Permit does not specify how many samples were analyzed for TDS and we therefore could not conduct a proper variability analysis. However, had the Regional Board properly conducted a statistical variability analysis; it is likely that an Effluent Limitation for TDS would have been required in accordance with federal regulation. Also, it is critical to recall that the sampling used to develop the proposed Permit was conducted at the surface level of the storage pond. Saline water sinks. Consequently, the actual TDS concentration in the discharge will likely be significantly higher than that reported by the Regional Board and the Discharger.

9. Effluent Limitations for iron and manganese are improperly regulated as an annual average contrary to Federal Regulations 40 CFR 122.45 (d)(2) and common sense.

Federal Regulation 40 CFR 122.45 (d)(2) requires that permit for POTWs establish Effluent Limitations as average weekly and average monthly unless impracticable. The proposed Permit establishes Effluent Limitations for iron and manganese as an annual average contrary to the cited Federal Regulation. Establishing the Effluent Limitations for iron and manganese in accordance with the Federal Regulation is not impracticable; to the contrary the Central Valley Regional Board has a long history of having done so. Iron is regulated as a secondary drinking water standard. The Iron standard was developed because iron makes drinking water taste unacceptably bad and discolors and stains laundry. These impacts occur on an instantaneous basis not over a year's period of time. The Regional Board cites that sources of drinking water are regulated by DPH and DPH implements the secondary MCLs as an annual average in the drinking water supply. The Regional Board fails to note the drinking water rights that have been issued downstream of the wastewater treatment plant. Individual homes and riparian water users are not subject to oversight by DPH and are not required by law to treat their drinking water prior to use. Proof of impracticability is properly a steep slope and the Regional Board has not presented any evidence that properly and legally limiting iron and manganese is impracticable.

10. The developed Effluent Limitation for Ammonia is incorrect and unprotective of the aquatic life beneficial use of the receiving water.

The proposed Permit correct cites that: *“The NAWQC for the protection of freshwater aquatic life for total ammonia, recommends acute (1-hour average; criteria maximum concentration or CMC) standards based on pH and chronic (30-day average; criteria continuous concentration or CCC) standards based on pH and temperature. USEPA also recommends that no 4-day average concentration should exceed 2.5 times the 30-day CCC.”*

The proposed Permit also correctly cites that ammonia toxicity increases as pH levels increase. The proposed Permit then states that: *“The maximum permitted effluent pH is 8.5, as the Basin Plan objective for pH in the receiving stream is the range of 6.5 to 8.5. In order to protect against the worst-case short-term exposure of an organism, a pH value of 8.5 was used to derive the acute criterion. The resulting acute criterion is 2.14 mg/L.”* The Regional Board fails to use the high measured storage pond pH of 10.3 pH units. The Regional Board also uses the pH and temperature of the receiving stream rather than the wastewater discharge forgetting that they are developing an “effluent limitation”. The receiving water has exhibited a low pH and toxicity in the stream would therefore be less of a threat for pH dependant ammonia. However, this ignores toxicity prior to and as the effluent mixes with the receiving stream. The wastewater has been sampled to have a higher pH than the receiving stream and would therefore exhibit a greater toxicity for ammonia. The ammonia effluent Limitation in the proposed Permit is not protective of the aquatic life beneficial use of the receiving stream and will not prevent toxicity within the mixing zone. The proposed Permit does not include an effluent Limitation for ammonia that complies with the requirements of 40 CFR 122.44.

11. The proposed Permit fails to implement the requirements of the Basin Plan, Implementation Policy for Application of Water Quality Objectives for additive toxicity.

Proposed Permit contains final effluent limitations for several constituents, including aluminum, copper and lead. The cited metals have a potential for exhibiting additive toxic effects. The Basin Plan, *Implementation, Policy for Application of Water Quality Objectives* requires that: *“Where multiple toxic pollutants exist together in water, the potential for toxicologic interactions exists. On a case by case basis, the Regional Water Board will evaluate available receiving water and effluent data to determine whether there is a reasonable potential for interactive toxicity. Pollutants which are carcinogens or which manifest their toxic effects on the same organ systems or through similar mechanisms will generally be considered to have potentially additive toxicity.”* The proposed Permit fails to discuss the potential for additive toxicity and fails to comply with the Basin Plan.

12. The proposed Permit fails to include a reasonable potential analysis or Effluent Limitations as prescribed by 40 CFR 122.44 or to include a proper enforcement mechanism for violation of Receiving Water Limitations based on Basin Plan water quality standards.

The proposed Permit, page F-57, states that: *“CWA section 303(a-c), requires states to adopt water quality standards, including criteria where they are necessary to protect beneficial uses. The Central Valley Water Board adopted water quality criteria as water quality objectives in the Basin Plan. The Basin Plan states that “[t]he numerical and narrative water quality objectives define the least stringent standards that the Regional Water Board will apply to regional waters in order to protect the beneficial uses.” The Basin Plan includes numeric and narrative water quality objectives for various beneficial uses and water bodies. This Order contains receiving surface water limitations based on the Basin Plan numerical and narrative water quality objectives for bacteria, biostimulatory substances, color, chemical constituents, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, suspended sediment, settleable substances, suspended material, tastes and odors, temperature, toxicity, and turbidity.”*

- Biostimulatory substances. The Basin Plan requires that wastewater discharges not cause water to contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses. Domestic wastewater contains phosphorus and ammonia which can be converted to nitrites and nitrates. The proposed Permit contains limitations for ammonia but does not address nitrates or phosphorus. The removal of ammonia is typically accomplished by converting it to nitrate. Ammonia will also convert to bioavailable nitrogen in the environment. Nitrogen and phosphorus are the primary nutrient causes of biostimulation. Biostimulation is not discussed with regard to ammonia, nitrogen or phosphorus in the proposed Permit. Biostimulation is also not discussed with regard to the compliance period allowed for ammonia or the potential impacts of converting ammonia to nitrate.
- Color. The Basin Plan requires that wastewater discharges not cause discoloration that causes nuisance or adversely affects beneficial uses. Pond system discharges are well known for their discolored discharges. Color is not discussed in the proposed Permit reasonable potential analysis. The Basin Plan contains drinking water MCLs as a part of the Chemical Constituents objective. There is an MCL for color which has not been assessed for compliance in the proposed Permit.
- The Basin Plan requires that wastewater discharges not cause the dissolved oxygen concentration to be reduced below 7.0 mg/l at any time. The proposed permit did not assess and does not take into account diurnal fluctuations for dissolved oxygen in the pond. There is no indication that the ponds were sampled in the early morning, near

dawn, to catch low periods of DO. The proposed Permit did not assess the need for an Effluent Limitation for DO.

- The Basin Plan requires that wastewater discharges not cause pH to be depressed below 6.5 nor raised above 8.5.
- The proposed Permit fails to assess compliance and require compliance with and the Receiving Water Limitation for Toxicity which is based on the Basin Plan narrative toxicity water quality objective.

The proposed Permit allows for chlorine to be discharged for approximately two years while a study is completed and a compliance project be completed if necessary. Chlorine is toxic to aquatic life and the toxic levels have been well established. A study should consist of collecting samples and analyzing them for chlorine, if any is present, dechlorination is needed. Two years is not necessary to complete what should be done in a matter of hours. Chemical companies have also been more than willing to set up temporary dechlorination systems within a matter of days. The compliance schedule to meet the final limitation for chlorine residual should be modified to be no more than a week.

Threatened toxicity violation:

The increasing production and use of pharmaceuticals and personal care products (PPCPs) – some of which may be endocrine disrupting compounds (EDCs) – have led to a growing concern about the occurrence of these compounds in the environment. Recent studies have reported the occurrence worldwide of EDCs, PPCPs, and other organic wastewater contaminants (OWCs) – collectively referred to as “constituents of emerging concern” (CECs) or “emerging constituents” (ECs) – in wastewater treatment plant (WWTP) effluents, surface waters used as drinking water supplies, and in some cases, finished drinking waters. Of the 126 samples analyzed for the project, one sample (American River at Fairbairn drinking water treatment plant [DWTP] intake collected in April 2008) had no detectable levels of any EDCs, PPCPs, or OWCs. All other samples had one or more analytes detected at or above the corresponding MRLs. The five most frequently detected PPCPs were caffeine, carbamazepine, primidone, sulfamethoxazole, and tris(2-chloroethyl) phosphate (TCEP). At the sample sites upstream of WWTP discharges in all three watersheds, the concentrations of selected PPCPs, except for caffeine, were low (i.e., ≤ 13 ng/L), pointing to WWTP discharges as the main source of most PPCPs and OWCs in the environment. (Source, Fate, and Transport of Endocrine disruptors, Pharmaceuticals, and Personal Care Products in Drinking Water Sources in California, National Water Research Institute Fountain Valley, California, May 2010)

Over the last 10 years, reports of feminized wildlife have fueled chilling headlines. Most of these reports have focused on the many ways that estrogen in sewage effluent can

distort normal male development. Now a new study reveals one way that the hormone pollutant can affect females: Too much estrogen causes subtle changes in female fish's courting behavior, which could alter a population's genetic makeup (Environ. Sci. Technol., DOI: 10.1021/es101185b).

Increase in intersex fish downstream from WWTP possibly associated with endocrine-active contaminants. (Boulder Colorado, Colorado University, 2008)

Skewed sex ratio downstream from WWTP possibly associated with endocrine-active contaminants. (Boulder Colorado, Colorado University, 2006)

Fluoxetine (FLX), Sertraline (SER) and their degradates NFLX, and NSER were the primary antidepressants in brain tissue samples. Little or no venlafaxine (VEN), the dominant antidepressant in both water and bed sediment, was present. Degradates were measured at higher concentrations in brain samples than parent compounds. (Boulder Creek, Colorado & Fourmile Creek, Iowa, the College of Wooster, 2010)

SAR sites (with WWTP or urban runoff influent) males had significantly lower Testosterone (T) than the reference site males. Males from SAR sites had significantly higher 17β -estradiol (E2) than reference site. Females from SAR sites had significantly lower E2 than the reference site females. (USGS, Santa Ana River (SAR) SAR sites, 2009)

“Several recent studies have documented endocrine disruption in Delta fish. One of the biomarkers of EDCs is intersex fish, fish with both male and female reproductive organs. A recent histopathological evaluation of delta smelt for the Pelagic Organism Decline found 9 of 144 maturing delta smelt (6%) collected in the fall were intersex males. This study provides evidence that delta smelt are being exposed to EDCs. Brander and Cherr (2008) observed choriogenin induction in male silversides from Suisun Marsh. Riordan and Adam (2008) reported endocrine disruption in male fathead minnows following in-situ exposures below the Sacramento Regional Treatment Plant. Lavado, et al. (in press) conducted studies in 2006 and 2007 to evaluate the occurrence and potential sources of EDCs in Central Valley waterways. In their study, estrogenic activity was repeatedly observed at 6 of 16 locations in the Bay-Delta watershed, including in water from the Lower Napa River and Lower Sacramento River in the Delta. Further studies are needed to identify the compounds responsible for the observed estrogenic activity and their sources.” (Alameda County Water District, Alameda County Flood Control and Water Conservation District, Zone 7, Metropolitan Water District of Southern California, San Luis & Delta-Mendota Water Authority, Santa Clara Valley Water District, State Water Contractors, June 1, 2010)

A recent study by the Toxic Substances Hydrology Program of the U.S. Geological Survey (USGS) shows that a broad range of chemicals found in residential, industrial, and agricultural wastewaters commonly occurs in mixtures at low concentrations downstream from areas of intense urbanization and animal production. The chemicals include human and veterinary drugs (including antibiotics), natural and synthetic hormones, detergent metabolites, plasticizers, insecticides, and fire retardants. One or more of these chemicals were found in 80 percent of the streams sampled. Half of the streams contained 7 or more of these chemicals, and about one-third of the streams contained 10 or more of these chemicals. This study is the first national-scale examination of these organic wastewater contaminants in streams and supports the USGS mission to assess the quantity and quality of the Nation's water resources. A more complete analysis of these and other emerging water-quality issues is ongoing. Knowledge of the potential human and environmental health effects of these 95 chemicals is highly varied; drinking-water standards or other human or ecological health criteria have been established for 14. Measured concentrations rarely exceeded any of the standards or criteria. Thirty-three are known or suspected to be hormonally active; 46 are pharmaceutically active. Little is known about the potential health effects to humans or aquatic organisms exposed to the low levels of most of these chemicals or the mixtures commonly found in this study. ("Pharmaceuticals, hormones, and other organic wastewater contaminants in U.S. streams, 1999-2000: A national reconnaissance," an article published in the March 15, 2002 issue of *Environmental Science & Technology*, v. 36, no. 6, pages 1202-1211. Data are presented in a companion USGS report, "Water-quality data for pharmaceuticals, hormones, and other organic wastewater contaminants in U.S. streams, 1999-2000" (USGS Open-File Report 02-94). These and other reports, data, and maps can be accessed on the Internet at <http://toxics.usgs.gov>.)

PPCPs are found where people or animals are treated with drugs and people use personal care products. PPCPs are found in any water body influenced by raw or treated sewage, including rivers, streams, ground water, coastal marine environments, and many drinking water sources. PPCPs have been identified in most places sampled. The U.S. Geological Survey (USGS) implemented a national reconnaissance to provide baseline information on the environmental occurrence of PPCPs in water resources. You can find more information about this project from the USGS's [What's in Our Wastewaters and Where Does it Go?](#) site. PPCPs in the environment are frequently found in aquatic environments because PPCPs dissolve easily and don't evaporate at normal temperature and pressures. Practices such as the use of sewage sludge ("biosolids") and reclaimed water for irrigation brings PPCPs into contact with the soil.
(<http://www.epa.gov/ppcp/faq.html#ifthereareindeed>)

From the recent scientific investigations and literature it is reasonable to conclude that "constituents of emerging concern" (CECs) are present in the wastewater discharge. It is

also reasonable to conclude that the wastewater discharge contains CECs in concentrations that at a minimum threaten to violate the Receiving Water Limitation for toxicity which prohibits toxic substances to be present in concentrations that produce detrimental physiological responses in human or aquatic life. The proposed Permit is silent with regard to CECs except to state that requiring filtration may reduce their quantity in the wastewater discharge. Monitoring for CECs in the wastewater discharge, in the receiving stream (the Sacramento River) or in agricultural diversions taken from within the proposed mixing zones is not required in the proposed Permit. It is undoubted that the Regional Board's response will be that the individual chemical pollutants do not have promulgated water quality standards and monitoring for CECs would therefore be unproductive. However, the Regional Board has an obligation to require an investigation of the potential violation of the Receiving Water Limitation for Toxicity. The Discharger is also required to assess compliance with all limitations and report any instances of non-compliance with limitations, including Receiving Water Limitations. The Regional Board is also, by 40 CFR 122.44, required to develop Effluent Limitations if the discharge presents a reasonable potential to exceed a water quality standard, including the narrative toxicity objective.

US EPA has compiled a database; *Treating Contaminants of Emerging Concern A Literature Review Database* (August 2010). Local wastewater treatment system design Engineers, such as Dr. Robert Emerick, have also been testing treatment system capabilities for removing CECs. There appear to be treatment technologies that are capable of removing significant levels of CECs.

At a minimum, the proposed Permit should include a requirement for a study of the presence of CECs in the wastewater discharge and the effectiveness of different treatment technologies to remove CECs. The report should be made available to the public.

13. The proposed Permit contains notification requirements that fail to notify the parties most at risk from the wastewater discharge.

The proposed Permit, page 25, requires that: "The discharger shall notify the regional water board, the stockton east water district, and the department of public health (dph) southern california drinking water field operations branch by telephone prior to initiating a discharge to bloods creek." The public downstream of the wastewater treatment plant holding water rights to use the stream for food crop irrigation, domestic and drinking water uses should be the first to be notified. It is also doubtful that the Regional Board has notified these same people of the proposed Permit which relaxes limits from tertiary to secondary.

14. The proposed Permit fails to comply with California Water Code Section 13176 by allowing environmental analyses to be conducted by a non-certified laboratory.

CWC § 13176. Certified laboratories (a) *The analysis of any material required by this division shall be performed by a laboratory that has accreditation or certification pursuant to Article 3 (commencing with Section 100825) of Chapter 4 of Part 1 of Division 101 of the Health and Safety Code. (b) No person or public entity of the state shall contract with a laboratory for environmental analyses for which the State Department of Health Services requires accreditation or certification pursuant to this chapter, unless the laboratory holds a valid certification or accreditation.*

CWC § 13383. Monitoring requirements (a) *The state board or a regional board may establish monitoring, inspection, entry, reporting, and recordkeeping requirements, as authorized by Sections 13160, 13376, or 13377 or by subdivisions (b) and (c) of this section, for any person who discharges, or proposes to discharge, to navigable waters, any person who introduces pollutants into a publicly owned treatment works, any person who owns or operates, or proposes to own or operate, a publicly owned treatment works or other treatment works treating domestic sewage, or any person who uses or disposes, or proposes to use or dispose, of sewage sludge.*

(b) *The state board or the regional boards may require any person subject to this section to establish and maintain monitoring equipment or methods, including, where appropriate, biological monitoring methods, sample effluent as prescribed, and provide other information as may be reasonably required.*

(c) *The state board or a regional board may inspect the facilities of any person subject to this section pursuant to the procedure set forth in subdivision (c) of Section 13267.*

The proposed Permit states that: “*General Monitoring Provisions, Chemical, bacteriological, and bioassay analyses of any material required by this Order shall be conducted by a laboratory certified for such analyses by the Department of Public Health (DPH). Laboratories that perform sample analyses must be identified in all monitoring reports submitted to the Central Valley Water Board. In the event a certified laboratory is not available to the Discharger for any onsite field measurements such as pH, turbidity, temperature and residual chlorine, such analyses performed by a noncertified laboratory will be accepted provided a Quality Assurance-Quality Control Program is instituted by the laboratory.*”

Not only does the Regional Board fail to comply with the cited law, but the Central Valley Regional Board uses the same language in each of its permits as an Underground Regulation. "Regulation" means every rule, regulation, order, or standard of general application or the amendment, supplement, or revision of any rule, regulation, order or standard adopted by any state agency to implement, interpret, or make specific the law enforced or administered by it, or to govern its procedure. (Government Code section 11342.600)

15. The Proposed Permit Fails to Include Limitations that are Protective of the Municipal and Domestic Beneficial Uses of the Receiving Stream Contrary to

Federal Regulations 40 CFR 122.4, 122.44(d) and the California Water Code, Section 13377.

The proposed Permit contains Findings that municipal and domestic supply (MUN) are beneficial uses of the receiving stream as designated in the Sacramento San Joaquin River Basins Water Quality Control Plan (Basin Plan). The proposed Permit, page F-17, states that: *“In addition, the State Water Board has issued water rights to existing water users along Bloods Creek and the North Fork Stanislaus River downstream of the discharge for domestic and irrigation uses. Bloods Creek is an ephemeral stream and the North Fork Stanislaus River likely provides groundwater recharge during periods of low flow. The groundwater is a source of drinking water. In addition to the existing water uses, growth in the area, downstream of the discharge is expected to continue, which presents a potential for increased domestic and agricultural uses of the water in Bloods Creek.”*

The Central Valley Regional Water Quality Control Board (Central Valley Water Board) issued Waste Discharge Requirements (WDR) Order R5-2005-0139 to the Bear Valley Water District Order R5-2005-0139 requiring that a tertiary level of treatment be provided based on recommendations from the California Department of Public Health (DPH).

The proposed Permit states that:

- “On 1 February 2011, the Discharger submitted updated water balance projections to characterize potential discharges to Bloods Creek under various precipitation water year assumptions. DPH subsequently provided an updated recommendation to the Central Valley Water Board in a letter dated 1 March 2011 stating that, based on the updated information, they no longer recommended tertiary treatment provided that certain requirements are included in the Order to minimize surface water discharges.”
- “The Discharger recently provided water quality data collected from its storage/polishing reservoir that corroborated the large dilution in the storage/polishing reservoir. Water quality samples were collected during May and June 2010, which is the time of year when a discharge may occur under wet years. Although the Facility provides only secondary treatment, the water quality characteristics of the wastewater are at tertiary levels (see Table F-10).”
- “Based on the updated information, DPH provided an updated recommendation to the Central Valley Water Board in a letter dated 1 March 2011 stating that they would forgo the tertiary treatment recommendation provided that certain requirements are included in this Order. This Order addresses the recommendations from DPH as follows”:
 - *Allow discharge only as a last resort*
 - *Shorten the allowed discharge season*

- *Require an I/I study*
- *Require an evaluation of alternatives to increase land disposal capacity*
- *Require water quality sampling of the storage reservoir during the discharge season*
- *Require notification of DPH whenever a discharge is planned*

Based on this revised recommendation the proposed tentative NPDES Permit establishes secondary treatment requirements, backsliding from the past tertiary treatment requirements. The proposed Permit does not shorten the allowed discharge season as recommended by DPH.

It appears that the revised DPH recommendation is largely based on the information in the proposed Permit (page F-42) *“Although the Facility provides only secondary treatment, the water quality characteristics of the wastewater are at tertiary levels (see Table F-10),”* Table F-10 cites that: the BOD is less than 1 mg/l; the TSS is less than 5 mg/l; the total coliform organisms are less than 2 MPN/100 ml, and; the turbidity is less than 1 NTU. However, this information was collected from the surface level of the storage pond, not an effluent discharge. We have commented in detail above why this information is not likely representative of an actual discharge to surface waters, specifically:

- *“The intake from the storage/polishing reservoir is a 12-inch high density polyethylene (HDPE) flexible hose attached to a float, designed to keep the intake suspended approximately 4 feet below the surface. This configuration allows for effluent to be drawn from the uppermost zone (i.e., the epilimnion), rather than the lowermost zone (i.e., the hypolimnion), which is of lower quality.”* The proposed Permit does not prohibit the discharge from the lower pond levels which exhibit lower quality water. The treatment system design capacity is 0.50 mgd, however a discharge of 2.5 mgd is allowed under the proposed Permit. During the period of discharge, water from the lower pond levels would logically become mixed with the surface water and discharged. There is no possible way for the “lower quality, lower elevation” water to be excluded from the discharge. The sampling from the pond surface only would not be representative of the discharge which was the basis of the proposed Permit. Use of the higher quality pond surface water to develop the proposed Permit would result in an absence of necessary limitations to protect the beneficial uses of the receiving stream.
- The proposed Permit does not specify what constituents were detected when sampling was conducted at the sampling tap that were “unacceptably” high. Since an iron pipe and plastic hose were used; it is possible that iron and phthalate could have been elevated; there would be little defense for discarding sampling for other constituents such as salts, toxic metals or volatile constituents. The proposed Permit should at a minimum have

presented the “unrepresentative” sampling results with some defense for discarding each individual constituent result.

- The water discharged into the storage pond is chlorinated and the facility does not provide any dechlorination. There is no indication that chlorine residual sampling was conducted. This is critical for the DPH decision-making process since the presence of chlorine in the storage pond would artificially oxidize BOD and continue to kill coliform organisms. The term “artificially” is used because chlorine is a volatile chemical and would tend to be located at the pond surface where the samples were collected. A complete mix of the pond water, recall as cited above the lower pond level water was specifically excluded from consideration since it was of lower quality. The presence of chlorine in collect samples taken to the laboratory would continue to oxidize the sample while being transported and stored prior to and during analysis. The BOD test is a 5-day test and chlorine present in the sample would invalidate the test.
- The sample values: BOD less than 1 mg/l; total coliform organisms less than 2 MPN/100 ml, and; turbidity less than 1 NTU are lower than the effluent results from the most advanced wastewater treatment plants. The low sampling results from a pond treatment system alone should have alerted the viewer of some potential problem with the data. It is highly unlikely that a pond system could produce a wastewater effluent of this quality.

It can only be concluded that DPH made their recommendation based on incorrect and incomplete information. There is no indication that DHP was presented the data showing “*the higher pollutant concentrations observed at the sample tap.*”

Federal Regulation, 40 CFR 122.4 (a), (d) and (g) require that no permit may be issued when the conditions of the permit do not provide for compliance with the applicable requirements of the CWA, or regulations promulgated under the CWA, when imposition of conditions cannot ensure compliance with applicable water quality requirements and for any discharge inconsistent with a plan or plan amendment approved under Section 208(b) of the CWA. Section 122.44(d) of 40 CFR requires that permits include water quality-based effluent limitations (WQBELs) to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water. California Water Code, section 13377, requires that: “Notwithstanding any other provision of this division, the state board and the regional boards shall, as required or authorized by the Federal Water Pollution Control Act, as amended, issue waste discharge and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with any more stringent effluent standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.”

The proposed Permit requiring secondary treatment is accompanied by a permit alternative requiring tertiary treatment. Tertiary treatment was required for this discharge under Waste Discharge Requirements Order No. R5-2005-0139 as was recommended by the California Department of Public Health (DPH). Tertiary treatment is deemed necessary to protect the designated beneficial uses of food crop irrigation and contact recreation within the receiving stream. Domestic and municipal water rights also exist downstream of the wastewater discharge. In the past DPH has gone on record stating that even tertiary treatment is not protective of the beneficial use of drinking water without significant additional treatment as is required under the Surface Water treatment Rule for drinking water supplies. Individual water users are not subject to the surface water treatment rule. It does not appear that DPH has addressed, in their latest correspondence with the Regional Board, the actual drinking water uses at individual homes downstream of the wastewater discharge and the level of treatment required to protect those uses. There is also no indication that the Regional Board has contacted the downstream individual water right holders regarding the proposal to lessen the required level of wastewater treatment and the level of treatment necessary to protect drinking water (potentially absent additional treatment).

The proposed Permit contains limitations for copper, lead, aluminum, iron and manganese. Tertiary treatment systems have difficulty meeting limitations for metals; the required secondary system will continue to fail to meet limitations for these pollutants. Five years down the road, under a secondary treatment scenario, the Regional Board will simply have to write another compliance Order to require treatment capable of meeting the limitations for copper, lead and aluminum. The same situation exists for ammonia, while tertiary treatment, filtration, does not accomplish nitrification, the secondary system cannot be adjusted to nitrify as has been shown numerous times at pond wastewater systems throughout the Central Valley. The proposed Permit should also be amended to discuss nitrates. If ammonia is converted to nitrates; the nitrates will need to be removed to prevent biostimulation and to protect the drinking water beneficial use.

Even if the data from the pond surface were accurate and representative of the overall wastewater discharge, perhaps the two most important questions that are unanswered by the Regional Board in the proposed Permit and by the DPH recommendation are:

- If the treatment plant is capable of producing a wastewater effluent with a BOD less than 1 mg/l, a TSS less than 5 mg/l, a total coliform organism level less than 2 MPN/100 ml and a turbidity of less than 1 NTU; why are the limitations being relaxed to the secondary levels of 30 mg/l for BOD and TSS, 23 MPN/100 ml for coliform and the limitations for turbidity are being eliminated altogether?
- Coliform organisms are only an indicator parameter. DPH and CCR Title 22 in requiring tertiary treatment require filtration because coliform organism counts alone do not

address the removal of virus and parasites. Even if the data from the pond surface were accurate, the proposed Permit limitations are substantially relaxed to secondary levels. How is an unfiltered secondary wastewater, even with 20-to-1 dilution in the receiving water, protective of drinking water for riparian water users where treatment prior to use is not legally required?

16. The proposed Permit contains Effluent Limitations less stringent than the existing permit contrary to the Antibacksliding requirements of the Clean Water Act and Federal Regulations, 40 CFR 122.44 (l)(1).

Under the Clean Water Act (CWA), point source dischargers are required to obtain federal discharge (NPDES) permits and to comply with water quality based effluent limits (WQBELs) in NPDES permits sufficient to make progress toward the achievement of water quality standards or goals. The antibacksliding and antidegradation rules clearly spell out the interest of Congress in achieving the CWA's goal of continued progress toward eliminating all pollutant discharges. Congress clearly chose an overriding environmental interest in clean water through discharge reduction, imposition of technological controls, and adoption of a rule against relaxation of limitations once they are established.

Upon permit reissuance, modification, or renewal, a discharger may seek a relaxation of permit limitations. However, according to the CWA, relaxation of a WQBEL is permissible only if the requirements of the antibacksliding rule are met. The antibacksliding regulations prohibit EPA from reissuing NPDES permits containing interim effluent limitations, standards or conditions less stringent than the final limits contained in the previous permit, with limited exceptions. These regulations also prohibit, with some exceptions, the reissuance of permits originally based on best professional judgment (BPJ) to incorporate the effluent guidelines promulgated under CWA §304(b), which would result in limits less stringent than those in the previous BPJ-based permit. Congress statutorily ratified the general prohibition against backsliding by enacting §§402(o) and 303(d)(4) under the 1987 Amendments to the CWA. The amendments preserve present pollution control levels achieved by dischargers by prohibiting the adoption of less stringent effluent limitations than those already contained in their discharge permits, except in certain narrowly defined circumstances.

When attempting to backslide from WQBELs under either the antidegradation rule or an exception to the antibacksliding rule, relaxed permit limits must not result in a violation of applicable water quality standards. The general prohibition against backsliding found in §402(o)(1) of the Act contains several exceptions. Specifically, under §402(o)(2), a permit may be renewed, reissued, or modified to contain a less stringent effluent limitation applicable to a pollutant *if*: (A) material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation; (B)(i)

information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance; or (ii) the Administrator determines that technical mistakes or mistaken interpretations of law were made in issuing the permit under subsection (a)(1)(B) of this section; (C) a less stringent effluent limitation is necessary because of events over which the permittee has no control and for which there is no reasonably available remedy [(e.g., Acts of God)]; (D) the permittee has received a permit modification under section 1311(c), 1311(g), 1311(h), 1311(i), 1311(k), 1311(n), or 1326(a) of this title; or (E) the permittee has installed the treatment facilities required to meet the effluent limitations in the previous permit, and has properly operated and maintained the facilities, but has nevertheless been unable to achieve the previous effluent limitations, in which case the limitations in the reviewed, reissued, or modified permit may reflect the level of pollutant control actually achieved (but shall not be less stringent than required by effluent guidelines in effect at the time of permit renewal, reissuance, or modification).

Even if a discharger can meet either the requirements of the antidegradation rule under §303(d)(4) or one of the statutory exceptions listed in §402(o)(2), there are still limitations as to how far a permit may be allowed to backslide. Section 402(o)(3) acts as a floor to restrict the extent to which BPJ and water quality-based permit limitations may be relaxed under the antibacksliding rule. Under this subsection, even if EPA allows a permit to backslide from its previous permit requirements, EPA may never allow the reissued permit to contain effluent limitations which are less stringent than the current effluent limitation guidelines for that pollutant, or which would cause the receiving waters to violate the applicable state water quality standard adopted under the authority of §303.49.

Federal regulations 40 CFR 122.44 (l)(1) have been adopted to implement the antibacksliding requirements of the CWA:

(1) Reissued permits. (1) Except as provided in paragraph (l)(2) of this section when a permit is renewed or reissued, interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under Sec. 122.62.)

(2) In the case of effluent limitations established on the basis of Section 402(a)(1)(B) of the CWA, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 304(b) subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.

(i) Exceptions--A permit with respect to which paragraph (1)(2) of this section applies may be renewed, reissued, or modified to contain a less stringent effluent limitation applicable to a pollutant, if:

(A) Material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation;

(B)(1) Information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance; or (2) The Administrator determines that technical mistakes or mistaken interpretations of law were made in issuing the permit under section 402(a)(1)(b);

(C) A less stringent effluent limitation is necessary because of events over which the permittee has no control and for which there is no reasonably available remedy;

(D) The permittee has received a permit modification under section 301(c), 301(g), 301(h), 301(i), 301(k), 301(n), or 316(a); or

(E) The permittee has installed the treatment facilities required to meet the effluent limitations in the previous permit and has properly operated and maintained the facilities but has nevertheless been unable to achieve the previous effluent limitations, in which case the limitations in the reviewed, reissued, or modified permit may reflect the level of pollutant control actually achieved (but shall not be less stringent than required by effluent guidelines in effect at the time of permit renewal, reissuance, or modification).

(ii) Limitations. In no event may a permit with respect to which paragraph (1)(2) of this section applies be renewed, reissued, or modified to contain an effluent limitation which is less stringent than required by effluent guidelines in effect at the time the permit is renewed, reissued, or modified. In no event may such a permit to discharge into waters be renewed, issued, or modified to contain a less stringent effluent limitation if the implementation of such limitation would result in a violation of a water quality standard under section 303 applicable to such waters.

The proposed Permit, page F-51, is incorrect in stating that: *“The effluent limitations in this Order are at least as stringent as the effluent limitations in the existing Order, with the exception of effluent limitations for iron and manganese.”*

- Order No. R5-2005-0139 established final mass-based effluent limitations for chlorine residual, copper, iron, and manganese.
- Order No. R5-2005-0139 established limitations for BOD₅, TSS, settleable solids, total coliform organisms, and turbidity for discharges to the storage/polishing reservoir. Order No. R5-2005-0139 also required discharges to the storage/polishing reservoir to receive tertiary treatment and be oxidized, coagulated, filtered, and disinfected, or equivalent treatment provided. The proposed Permit fails to state that Order No. R5-2008-0141 also contained these same tertiary treatment requirements. The limitations in both Orders were for a monthly average for BOD and TSS of 10 mg/l, a total coliform organism limitation of 2.2 MPN/100 ml as a 7-day median and a daily average turbidity limitation of 2 NTU.

The mass based limitations for chlorine residual, copper, iron, and manganese have been removed from the permit. The proposed Permit does not cite a single exception listed in 40 CFR 122.44 (l)(1), which would allow backsliding for removal of the mass limits for these constituents. The proposed Permit also changes the limitations for iron and manganese from monthly average to annual average limitations without citing a single exception listed in 40 CFR 122.44 (l)(1) which would allow backsliding for relation of the limits for these constituents.

The removal of tertiary treatment based limitations for BOD, TSS, coliform organisms and turbidity are based on sampling of the surface water from the storage pond, not the discharge. Water quality samples of the effluent and from the lower depths of the storage pond were discarded as inaccurate and not representative of the discharge and not reported in the proposed Permit. The above discussion and comments detail why the surface sampling of the storage pond used to develop the proposed Permit is inaccurate. Specifically:

- *“The intake from the storage/polishing reservoir is a 12-inch high density polyethylene (HDPE) flexible hose attached to a float, designed to keep the intake suspended approximately 4 feet below the surface. This configuration allows for effluent to be drawn from the uppermost zone (i.e., the epilimnion), rather than the lowermost zone (i.e., the hypolimnion), which is of lower quality.”* The proposed Permit does not prohibit the discharge from the lower pond levels which exhibit lower quality water. The treatment system design capacity is 0.50 mgd, however a discharge of 2.5 mgd is allowed under the proposed Permit. During the period of discharge, water from the lower pond levels would logically become mixed with the surface water and discharged. There is no possible way for the “lower quality, lower elevation” water to be excluded from the discharge. The sampling from the pond surface only would not be representative of the discharge which was the basis of the proposed Permit. Use of the higher quality pond surface water to develop the proposed Permit would result in an absence of necessary limitations to protect the beneficial uses of the receiving stream.
- The proposed Permit does not specify what constituents were detected when sampling was conducted at the sampling tap that were “unacceptably” high. Since an iron pipe and plastic hose were used; it is possible that iron and phthalate could have been elevated; there would be little defense for discarding sampling for other constituents such as salts, toxic metals or volatile constituents. The proposed Permit should at a minimum have presented the “unrepresentative” sampling results with some defense for discarding each individual constituent result.
- Density = Mass/Volume. If mass is increased but the volume is not then the density increases. Salt dissolves in water so it adds to the mass but not to the volume therefore

increasing the density. The proposed Permit ignores the fact that saline waters are heavier and would naturally sink to the bottom of the pond. The proposed Permit is incorrect and incomplete with regard to the Reasonable Potential Analysis for EC, TDS and chloride since the conducted sampling would have eliminated the high salinity water from the analysis.

- Toxic dissolved metals would also increase the density of water causing the higher concentration of metal laden water to sink to the bottom of the pond. Obviously, total or particulate metals would be heavier than water and would also be found nearer to the bottom of the pond.
- Hardness (calcium carbonate), as with salinity, would increase the density of water and the higher concentrations would be found at the bottom of a pond or reservoir. The proposed Permit utilized the hardness of the water collected at the pond surface to develop limitations for toxic metals. Since this hardness is not likely representative of the discharge or the total volume pond volume; the upstream ambient hardness would appropriately be recorded as the lowest observed hardness which is the appropriate hardness to use in the reasonable potential analysis. The proposed Permit also ignores the fact that domestic sewage hardness levels are higher than a communities drinking water source supply; it is highly unlikely that the wastewater hardness could be as low as 6.9 mg/l.
- Dissolved oxygen may be absent at the lower depths of the pond depending on the total pond depth. The dissolved oxygen levels in the discharge were ignored in the reasonable potential analysis for developing Effluent Limitations.
- Chlorine is volatile and would be neared the pond surface where the sampling was conducted. There is no information that the samples were dechlorinated; the chlorine concentration could have suppressed BOD levels in samples collected from the pond surface.
- Settleable solids, by definition, would have settled to the lower depths of the pond and would have been excluded from the samples collected from the pond surface.
- The proposed Permit, page F-47, states that: *“Chronic aquatic toxicity. The basin plan contains a narrative toxicity objective that states, “all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.” (basin plan at page iii-8.00). Two chronic toxicity tests were conducted during the term of order no. R5-2005-0139 in june 2007 and july 2009. The june 2007 testing event did not indicate that the discharge was toxic. The*

July 2009 testing event did indicate impacts to ceriodaphnia dubia reproduction. However, the July 2009 testing event may not be representative of potential discharge conditions, as it was conducted outside the discharge period of 1 January through 30 June, there was minimal flow in Bloods Creek, the influent sampler was used to collect samples, and the storage/polishing reservoir was experiencing an algae bloom that had to be filtered from the samples. Therefore, adequate chronic toxicity data is not available to determine if the discharge has reasonable potential to cause or contribute to an in-stream excursion above the basin plan's toxicity objective." (Underline emphasis added)

The proposed Permit acknowledges that the wastewater discharge has not been adequately characterized to develop limitations to protect water quality and the beneficial uses of the receiving stream.

- Chlorination is provided following the aeration pond and prior to the storage pond. It is highly unlikely that the effluent discharge from the storage pond would be capable of meeting the proposed Permit limitation for total coliform organisms, unless chlorine residual is maintained in the storage pond above toxic levels. Coliform organisms will be added to the storage pond by birds, other animals and even from the soils. Few surface waters could meet a 23 MPN/100 ml coliform standard which is necessary to adequately disinfect sewage to a secondary level as prescribed by DPH. The sampling collected from the surface of the storage pond is either incorrect or large concentrations of toxic chlorine reside in the storage pond. The sampling used to develop the proposed Permit is not representative of the discharge that will occur to surface waters.
- A recent study by the Toxic Substances Hydrology Program of the U.S. Geological Survey (USGS) shows that a broad range of chemicals found in residential, industrial, and agricultural wastewaters commonly occurs in mixtures at low concentrations downstream from areas of intense urbanization and animal production. The chemicals include human and veterinary drugs (including antibiotics), natural and synthetic hormones, detergent metabolites, plasticizers, insecticides, and fire retardants. One or more of these chemicals were found in 80 percent of the streams sampled. Half of the streams contained 7 or more of these chemicals, and about one-third of the streams contained 10 or more of these chemicals. This study is the first national-scale examination of these organic wastewater contaminants in streams and supports the USGS mission to assess the quantity and quality of the Nation's water resources. A more complete analysis of these and other emerging water-quality issues is ongoing. Knowledge of the potential human and environmental health effects of these 95 chemicals is highly varied; drinking-water standards or other human or ecological health criteria have been established for 14. Measured concentrations rarely exceeded any of the standards or criteria. Thirty-three are known or suspected to be hormonally active; 46 are pharmaceutically active. Little is known about the potential health effects to humans or

aquatic organisms exposed to the low levels of most of these chemicals or the mixtures commonly found in this study. ("Pharmaceuticals, hormones, and other organic wastewater contaminants in U.S. streams, 1999-2000: A national reconnaissance," an article published in the March 15, 2002 issue of *Environmental Science & Technology*, v. 36, no. 6, pages 1202-1211. Data are presented in a companion USGS report, "Water-quality data for pharmaceuticals, hormones, and other organic wastewater contaminants in U.S. streams, 1999-2000" (USGS Open-File Report 02-94). These and other reports, data, and maps can be accessed on the Internet at <http://toxics.usgs.gov>.)

These chemicals are found where people or animals are treated with drugs and people use personal care products. Such chemicals are found in any water body influenced by raw or treated sewage, including rivers, streams, ground water, coastal marine environments, and many drinking water sources. Toxic chemicals have been identified in most places sampled. The US geological survey (USGS) implemented a national reconnaissance to provide baseline information on the environmental occurrence of toxic chemicals in water resources. The proposed Permit fails to require any assessment of "constituents of emerging concern despite that drinking water intakes are located downstream and aquatic life is a beneficial use of the receiving stream.

- The water discharged into the storage pond is chlorinated and the facility does not provide any dechlorination. There is no indication that chlorine residual sampling was conducted. This is critical for the DPH decision-making process since the presence of chlorine in the storage pond would artificially oxidize BOD and continue to kill coliform organisms. The term "artificially" is used because chlorine is a volatile chemical and would tend to be located at the pond surface where the samples were collected. A complete mix of the pond water, recall as cited above the lower pond level water was specifically excluded from consideration since it was of lower quality. The presence of chlorine in collect samples taken to the laboratory would continue to oxidize the sample while being transported and stored prior to and during analysis. The BOD test is a 5-day test and chlorine present in the sample would invalidate the test.
- The sample values: BOD less than 1 mg/l; total coliform organisms less than 2 MPN/100 ml, and; turbidity less than 1 NTU are lower than the effluent results from the most advanced wastewater treatment plants. The low sampling results from a pond treatment system alone should have alerted the viewer of some potential problem with the data. It is highly unlikely that a pond system could produce a wastewater effluent of this quality.

The Regional Board's proposed Permit does not contain "new" information regarding the discharge that would allow relaxation of limitations under 40 CFR 122.44. The "new" information used by the Regional Board to develop the proposed Permit is from an internal point

in the treatment process and the data is at best highly questionable, certainly not sufficient to relax permit limitations.

17 The proposed Permit establishes Effluent Limitations for metals based on the hardness of the effluent as opposed to the ambient instream receiving water hardness and fails to use the mandated equations as required by Federal Regulations, the California Toxics Rule (CTR, 40 CFR 131.38(c)(4)).

First it must be noted that the proposed Permit uses a hardness of 6.9 mg/l stating such is the lowest recorded hardness of the effluent. However, page F-19 of the proposed Permit states that: *“Storage/polishing reservoir data used to conduct the RPA is limited to monitoring from the surface of the storage/polishing reservoir conducted during the 2008, 2009, and 2010 discharge seasons, which included up to 14 samples for certain constituents and one priority pollutant scan.”* Hardness (calcium carbonate), as with salinity, would increase the density of water and the higher concentrations would be found at the bottom of a pond or reservoir. The proposed Permit utilized the hardness of the water collected at the pond surface to develop limitations for toxic metals. Since this hardness is not likely representative of the discharge or the total volume pond volume; the upstream ambient hardness would appropriately be recorded as the lowest observed hardness which is the appropriate hardness to use in the reasonable potential analysis. The proposed Permit also ignores the fact that domestic sewage hardness levels are higher than a communities drinking water source supply; it is highly unlikely that the wastewater hardness could be as low as 6.9 mg/l. It must also be noted that sampling from the discharge pipeline and from the lower depths of the storage pond were discarded as not representative and were not presented in the proposed Permit. The hardness data used in the proposed Permit is at best questionable.

**Hardness
The Court’s Ruling**

The California Toxics Rule (CTR) Federal Regulation 40 CFR 131.38(c)(4) states that: “For purposes of calculating freshwater aquatic life criteria for metals from the equations in paragraph (b)(2) of this section, for waters with a hardness of 400 mg/l or less as calcium carbonate, the actual ambient hardness of the surface water shall be used in those equations.” (Emphasis added).

As is stated in the proposed Permit, the permit is being amended based on a ruling of the Superior Court of California (Case number 34-2009-80000309) (County of Sacramento, Judge Timothy M. Frawley, 26 January 2011). With regard to the development of effluent limitations for hardness dependant metals and an objection by the Regional Board the court found that:

“Ruling. Respondent Board's objection is denied The Court finds no ambiguity in the footnote. If the Board calculates the fresh aquatic life criteria for hardness-dependent metals based on the hardness value of the downstream receiving water, it must use the actual ambient hardness of the surface water after the effluent and receiving water have fully mixed It cannot use the hardness values of the receiving water "at or immediately downstream of the discharge outfall," since this is (for all intents and purposes) the same as using the hardness values of the effluent, which is prohibited.”

With regard to hardness dependant metals the Court ruling, in part, also contains the following:

On balance, the Court is persuaded that the term "ambient," as applied in the CTR, refers to the surface water surrounding the aquatic life In light of the purpose of the CTR, it would be unreasonable to interpret the regulation as requiring States to ignore the effect of the effluent on the hardness (and consequent toxicity) of the downstream receiving water. The most reasonable interpretation of the regulation, therefore, is that the metal criteria should be calculated based on the actual ambient hardness of the surface water after the effluent and receiving water mix.⁷ Stated differently, the criteria should be based on the upstream receiving water hardness, adjusted, as necessary, for the effects of the effluent. (Footnote No. 7 on page 14 of the final court order states that: “This means after the effluent and receiving water fully mix”)

For the determination of the CTR hardness-dependent metals criteria, the Board has the discretion to use either the upstream receiving water hardness values or the hardness values of the downstream mixture of the effluent and the receiving water, whichever is most protective.

The final court ruling is quite clear that when developing effluent limitations for hardness dependant metals that:

- (1) The hardness of the surface water must be used,
- (2) Use of the effluent hardness is prohibited, and
- (3) The term ambient means that the hardness must be taken from outside the area where the effluent mixes with the receiving stream.
- (4) Either the upstream surface water hardness or the downstream surface water hardness (following complete mixing with the effluent) may be used to develop effluent limitations for hardness dependant metals, whichever is most protective.

The Effluent Hardness Was Used in the Revised Permit

The proposed Permit, page F-23, states that:

“For both copper and zinc, using the “fully mixed” hardness value results in criteria that are higher (less stringent) than using the effluent-dominated (100% effluent) condition in the receiving water. Effluent limitations based on the less stringent criteria would allow

the effluent to cause receiving water toxicity during low-flow conditions. Even assuming that would be a correct interpretation of the CTR and SIP or the EID Court Order, a more stringent effluent limitation would be required to comply with the Basin Plan's narrative toxicity objective unless the Board approves a mixing zone. 14 Accordingly, this Order sets effluent limitations for copper and zinc based on low-flow conditions as shown in the above tables. (Emphasis added)

The "above tables" referred to in the permit are Tables F-4 and F-5 on pages F-21 and F-22. The "low flow conditions" described in the text can be observed in Tables F-4 and F-5 in the far left hand lower column of the tables. The "low flow condition" in the tables represents "100% effluent" with a recorded effluent hardness value of 6.9 mg/l.

Throughout the text in the proposed Permit, pages F-16 through F-26, discussing the development of effluent limitations for hardness dependant metals, the discussion is limited to the effluent and upstream ambient hardness. The downstream surface water ambient hardness, as defined by the court, following complete mixing is not discussed or numerically cited. While the Regional Board attempts to calculate this value, we can only conclude based on the total absence of downstream surface water ambient hardness values that the Discharger has not sampled it.

On page F-20 of the proposed Permit, the discussion, equation 3 and the following Table F-4 are all based on the lowest observed effluent hardness of 42 mg/l. Again, based on the total absence of discussion of any downstream surface water sampling for hardness, the Regional Board's decision process is based on the effluent hardness, which was confirmed by the Superior Court is prohibited.

The proposed Permit discussion beginning on page F-23 again focuses on the effluent hardness. This can be observed by evaluation of equation 4 (page F-23) where the input value H_e represents the lowest observed effluent value. The data in Table F-5 are based on equation 4 and is therefore also based on the effluent hardness.

The development of effluent limitations for hardness dependant metals in the proposed Permit is based on the effluent hardness or a combination of the effluent and upstream hardnesses. The use of the effluent hardness rather than the CTR prescribed "actual ambient hardness of the surface water" is contrary to the requirements of the CTR and directly violates the mandate of the Superior Court's Order. As cited above the Superior Court clearly stated that use of the effluent hardness is prohibited.

The Wrong Equations Were Used

The California Toxics Rule (CTR) Federal Regulation 40 CFR 131.38(c)(4) states that: “For purposes of calculating freshwater aquatic life criteria for metals from the equations in paragraph (b)(2) of this section, for waters with a hardness of 400 mg/l or less as calcium carbonate, the actual ambient hardness of the surface water shall be used in those equations.” (Emphasis added).

The CTR requires the use of the equations presented in paragraph (b)(2) of 40 CFR 131.38 for the development of effluent limitations for hardness dependant metals. The required CTR equation is:

$$\text{CTR Criterion} = \text{WER} \times (\exp(m[\ln(H)]+b))$$

where: H = hardness (mg/L as CaCO₃), WER = water-effect ratio (with a default value of 1) and m, b = metal and criterion specific constants.

The CTR equation is cited as “equation 1” in the proposed Permit (page F-18). The proposed Permit cites a 2006 technical paper prepared by Robert Emerick (see footnote 7 on page F-18) as the source of the equations used by the Regional Board in developing the Permit effluent limitations for some hardness dependant metals (see Table F-6 footnote 2). Dr. Emerick’s equation 4 is presented on page F-23 of the proposed Permit. Equation 4 is not the same as equation 1 which is prescribed by the CTR. The proposed Permit states that: “*Equation 4 is not used in place of the CTR equation (Equation 1). Rather, Equation 4, which is derived using the CTR equation, is used as a direct approach for calculating the ECA. This replaces an iterative approach for calculating the ECA. The CTR equation has been used to evaluate the receiving water downstream of the discharge at all discharge and flow conditions to ensure the ECA is protective (e.g., see Table F-7).*” Again the Regional Board clearly shows that the CTR specified equation was not used but attempts to use semantics to make it appear as such.

The use of equations other than those prescribed by the CTR for development of effluent limitations for hardness dependant metals is contrary to the requirements of the CTR.

The “ambient” hardness was not used

Federal Regulation 40 CFR 131.38(c)(4) states that: “For purposes of calculating freshwater aquatic life criteria for metals from the equations in paragraph (b)(2) of this section, for waters with a hardness of 400 mg/l or less as calcium carbonate, the actual ambient hardness of the surface water shall be used in those equations.” (Emphasis added).

The common dictionary definition of *ambient* is “in the surrounding area”, “encompassing on all sides”.

The common definition of ambient of surrounding would eliminate any areas that included the wastewater effluent in consideration of the hardness used in determining criteria for hardness dependant metals. It is reasonable to assume, after considering the definition of ambient, that EPA is referring to the hardness of the receiving stream before it is potentially impacted by an effluent discharge. It is also reasonable to make this assumption based on past interpretations and since EPA, in permit writers' guidance and other reference documents, generally assumes receiving streams have dilution, which would ultimately "encompass" the discharge. Ambient conditions are in-stream conditions unimpacted by the discharge. Confirming this definition, the SIP Sections 1.4.3.1 *Ambient Background Concentration as an Observed Maximum* and 1.4.3.2 state in part that: "If possible, preference should be given to ambient water column concentrations measured immediately upstream or near the discharge, but not within an allowed mixing zone for the discharge. The RWQCB shall have discretion to consider if any samples are invalid for use as applicable data due to evidence that the sample has been erroneously reported or the sample is not representative of the ambient receiving water column that will mix with the discharge."

The term ambient is also supported by a biological opinion issued by the US Fish and Wildlife Service (Service) and the National Marine Fisheries Service (NMFS) on March 24th 2000. On March 24, 2000 the US Fish and Wildlife Service (Service) and the National Marine Fisheries Service (NMFS) issued a biological opinion on the effects of the final promulgation of the CTR on listed species and critical habitats in California in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.; Act). The biological opinion was issued to the U.S. Environmental Protection Agency, Region 9, with regard to the "Final Rule for the Promulgation of Water Quality Standards: Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California" (CTR)". The document represented the Services' final biological opinion on the effects of the final promulgation of the CTR on listed species and critical habitats in California in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.; Act). The biological opinion contains the following discussion, beginning on page 205, regarding the use of hardness in developing limitations for toxic metals:

"The CTR should more clearly identify what is actually to be measured in a site water to determine a site-specific hardness value. Is the measure of hardness referred to in the CTR equations a measure of the water hardness due to calcium and magnesium ions only? If hardness computations were specified to be derived from data obtained in site water calcium and magnesium determinations alone, confusion could be avoided and more accurate results obtained (APHA 1985). Site hardness values would thus not include contributions from other multivalent cations (e.g., iron, aluminum, manganese), would not rise above calcium + magnesium hardness values, or result in greater-than-intended site criteria when used in formulas. In this Biological opinion, what the Services refer to as hardness is the water hardness due to calcium + magnesium ions only.

The CTR should clearly state that to obtain a site hardness value, samples should be collected upstream of the effluent source(s). Clearly stating this requirement in the CTR would avoid the computation of greater-than-intended site criteria in cases where samples were collected downstream of effluents that raise ambient hardness, but not other important water qualities that affect metal toxicity (e.g., pH, alkalinity, dissolved organic carbon, calcium, sodium, chloride, etc.). Clearly, it is inappropriate to use downstream site water quality variables for input into criteria formulas because they may be greatly altered by the effluent under regulation. Alterations in receiving water chemistry by a discharger (e.g., abrupt elevation of hardness, changes in pH, exhaustion of alkalinity, abrupt increases in organic matter etc.) should not result, through application of hardness in criteria formulas, in increased allowable discharges of toxic metals. If the use of downstream site water quality variables were allowed, discharges that alter the existing, naturally-occurring water composition would be encouraged rather than discouraged. Discharges should not change water chemistry even if the alterations do not result in toxicity, because the aquatic communities present in a water body may prefer the unaltered environment over the discharge-affected environment. Biological criteria may be necessary to detect adverse ecological effects downstream of discharges, whether or not toxicity is expressed.”

The Regional Board has argued however that they had discretion to redefine “ambient” and were not constrained by common dictionary definitions. The Regional Board’s definition of “ambient” included the wastewater effluent.

The Superior Court (Superior Court of California (Case number 34-2009-80000309) (County of Sacramento, Judge Timothy M. Frawley, 26 January 2011) ruled that the common dictionary definition of ambient was applicable, but that “ambient” also included the downstream waters after complete mix with the wastewater effluent had occurred.

The proposed Permit continues to utilize the wastewater effluent hardness when establishing criteria for hardness dependant metals. This can best be observed by review of Tables F-4, F-5 and F-6 in which the “Fully Mixed Downstream Ambient Conditions” are based on the “Effluent Fraction” which ranges from 1% to 100%. This is also confirmed in the text regarding hardness in the Fact Sheet and by “equation 4” on page F-23 which is partly based on the “lowest observed effluent hardness”.

The Regional Board in the proposed Permit continues to use the effluent as “ambient” in their calculation of criteria for hardness dependant metals contrary to common definition, the language in the SIP, guidance from the US Fish and Wildlife Service and the National Marine Fisheries Service and a ruling by the Superior Court.

Use of the “Surface Water Hardness”

Federal Regulation 40 CFR 131.38(c)(4) states that: “For purposes of calculating freshwater aquatic life criteria for metals from the equations in paragraph (b)(2) of this section, for waters with a hardness of 400 mg/l or less as calcium carbonate, the actual ambient hardness of the surface water shall be used in those equations.” (Emphasis added).

As is stated above, the proposed Permit continues to utilize the wastewater effluent hardness when establishing criteria for hardness dependant metals. This can best be observed by review of the Tables in the Fact Sheet in which the “Fully Mixed Downstream Ambient Conditions” are based on the “Effluent Fraction” which ranges from 1% to 100%. This is also confirmed in the text regarding hardness in the Fact Sheet and by “equation 4” on which is partly based on the “lowest observed effluent hardness”.

The wastewater effluent is not “surface water”. The Regional Board has not argued this point but has steadfastly refused to acknowledge or discuss the CTR requirement that the hardness of the surface water be used in calculating the criteria for hardness dependant metals. The proposed Permit is again based on the hardness of the effluent, not surface water, for hardness dependant metals.

The “Emerick” Paper cannot be used

The proposed Permit relies on the “Emerick” paper in developing effluent limitations for hardness dependant metals. The “Emerick” paper is inappropriate for use based on the following:

- The “Emerick” paper does not utilize the hardness of the surface water but also heavily relies on the effluent hardness. Recall that 40 CFR 131.38 requires use of the actual ambient hardness of the surface water.
- The “Emerick” paper does not solely use the equations specified in 40 CFR 131.38(c)(4).
- The “Emerick” paper does not utilize the ambient hardness also heavily relies on the effluent hardness.
- The “Emerick” paper ignores the other important water qualities that affect metal toxicity (e.g., pH, alkalinity, dissolved organic carbon, calcium, sodium, chloride, etc.) and focuses solely on hardness. As can be seen the U.S. EPA’s latest ambient criteria for copper (*Aquatic Life Ambient Freshwater Quality Criteria—Copper 2007 Revision*), the latest science utilizes these other quality that affect metal toxicity. Since EPA published the hardness-based recommendation for copper criteria in 1984, new data have become available on copper toxicity and its effects on aquatic life. The Biotic Ligand Model (BLM) – a metal bioavailability model that uses receiving water body characteristics to develop site-specific water quality criteria – utilizes the best available science and serves as the basis for the new national recommended criteria. The BLM requires ten input parameters to calculate a freshwater copper criterion (a saltwater BLM is not yet available): temperature, pH, dissolved organic carbon (DOC), calcium, magnesium,

sodium, potassium, sulfate, chloride, and alkalinity. The BLM is used to derive the criteria rather than as a post-derivation adjustment as was the case with the hardness-based criteria. This allows the BLM-based criteria to be customized to the particular water under consideration. The Regional Board failed to utilize the latest science in developing the proposed Permit.

- The Central Valley Regional Board uses the same language and uses the “Emerick” method in each of its permits as an Underground Regulation. "Regulation" means every rule, regulation, order, or standard of general application or the amendment, supplement, or revision of any rule, regulation, order or standard adopted by any state agency to implement, interpret, or make specific the law enforced or administered by it, or to govern its procedure. (Government Code section 11342.600)

Establishing a protective limitation

For the great majority of wastewater discharges to surface waters the hardness of the effluent is much greater than the hardness of the upstream surface water. In such cases, use of the higher hardness of the effluent to calculate discharge limitations for hardness dependant metals results in significantly less stringent discharge limitations. The “Emerick” method uses the higher effluent hardness to determine criteria as the effluent mixes with surface water. The Regional Board has used the “Emerick” method to generate these less stringent limitations stating that the methodology only eliminates what would have otherwise been overly protective limitations¹. Adherence to the required CTR methodology using the lower surface water hardness would, under these circumstances, produce more stringent criteria. In reviewing the Central Valley Regional Board’s NPDES permits it can be seen that use of the “Emerick” method is used by default, ignoring the mandated CTR method of calculating criteria for hardness dependant metals. It has been questioned whether the Regional Board’s default use of the “Emerick” method constitutes an underground regulation. "Regulation" means every rule, regulation, order, or standard of general application or the amendment, supplement, or revision of any rule, regulation, order or standard adopted by any state agency to implement, interpret, or make specific the law enforced or administered by it, or to govern its procedure.” (Government Code section 11342.600).

¹ See permits for Sacramento Regional (http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/sacramento/r5-2010-0114_npdes.pdf, at pages F-22 and 23), The City of Auburn (http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/placer/r5-2010-0090-01.pdf, page F-23 “An ECA based on a lower hardness (e.g., lowest upstream receiving water hardness) would also be protective, but would result in unreasonably stringent effluent limits considering the known conditions.”), Placer County SMD-1 (http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/placer/r5-2010-0092.pdf, page F-26, “Use of a lower ECA (e.g., calculated based solely on the lowest upstream receiving water hardness) is also protective, but would lead to unreasonably stringent effluent limits considering the known conditions.”)

The Regional Board cannot produce a technical defense that use of the CTR prescribed methods is overly protective. To the contrary, the US Fish and Wildlife Service and the National Marine Fisheries Service in their biological opinion and U.S. EPA in developing new ambient criteria for copper, all state that the use of hardness alone, ignoring temperature, pH, dissolved organic carbon (DOC), calcium, magnesium, sodium, potassium, sulfate, chloride, and alkalinity, may not be protective of water quality. The agencies, in their biological opinion, state that only the lower upstream hardness should be used to account for the inaccuracies of using hardness alone. The Regional Board does not present any technical information to rebut the technical fisheries and water quality standards development experts at US Fish and Wildlife Service, the National Marine Fisheries Service or U.S. EPA. The Regional Board has refused to discuss the technical merits of the opinions given by the US Fish and Wildlife Service, the National Marine Fisheries Service and U.S. EPA, stating only that the opinions address the CTR and are not applicable to individual permitting actions.

There are a few unique circumstances when a wastewater discharge occurs at the headwaters of a stream or where the natural upstream surface water hardness is higher than the effluent hardness. Under the first circumstance there is no upstream surface water hardness. Under the circumstance where the upstream hardness is higher than the effluent hardness, use of the upstream surface water hardness will produce criteria that are not sufficiently protective of water quality. This is the condition observed at Deer Creek. The unique circumstances do not nullify the regulatory requirements to use the ambient surface water hardness or to use the CTR prescribed equations when calculating criteria for hardness dependant metals. There is however a legal and technically correct way to properly address these situations. The methodology to protect water quality in these rare events is prescribed in the federal regulations: the CTR method must be followed to show that the developed criteria are not protective of water quality; 40 CFR 122.44 (d)(1) should be cited as requiring the development of limitations more stringent than the promulgated effluent limitations, and; use of the CTR prescribed method using the lower hardness used to develop the more protective limitations. The Regional Board's consistent use of the "Emerick" method, and the Regional Board's assessment that use of the CTR prescribed methodology using the lowest observed hardness is overly protective, are without technical or legal merit.

18. The proposed Permit fails to contain an inadequate antidegradation analysis that complies with the requirements of Section 101(a) of the Clean Water Act, Federal Regulations 40 CFR § 131.12, the State Board's Antidegradation Policy (Resolution 68-16) and California Water Code (CWC) Sections 13146 and 13247.

The proposed Permit relaxes Effluent Limitations for BOD, TSS, iron, manganese and total coliform organisms and removes a limitation for turbidity. The relaxation and removal of limitations will result in an allowable increased mass of pollutants to surface waters. The proposed Permit does not contain an Antidegradation Analysis and there is no indication that an

Antidegradation Analysis was conducted by the Discharger to address the increased mass of pollutants to surface waters.

CWC Sections 13146 and 13247 require that the Board in carrying out activities which affect water quality shall comply with state policy for water quality control unless otherwise directed by statute, in which case they shall indicate to the State Board in writing their authority for not complying with such policy. The State Board has adopted the Antidegradation Policy (Resolution 68-16), which the Regional Board has incorporated into its Basin Plan. The Regional Board is required by the CWC to comply with the Antidegradation Policy.

Section 101(a) of the Clean Water Act (CWA), the basis for the antidegradation policy, states that the objective of the Act is to “restore and maintain the chemical, biological and physical integrity of the nation’s waters.” Section 303(d)(4) of the CWA carries this further, referring explicitly to the need for states to satisfy the antidegradation regulations at 40 CFR § 131.12 before taking action to lower water quality. These regulations (40 CFR § 131.12(a)) describe the federal antidegradation policy and dictate that states must adopt both a policy at least as stringent as the federal policy as well as implementing procedures.

California’s antidegradation policy is composed of both the federal antidegradation policy and the State Board’s Resolution 68-16 (State Water Resources Control Board, Water Quality Order 86-17, p. 20 (1986) (“Order 86-17”); Memorandum from Chief Counsel William Attwater, SWRCB to Regional Board Executive Officers, “federal Antidegradation Policy,” pp. 2, 18 (Oct. 7, 1987) (“State Antidegradation Guidance”). As a state policy, with inclusion in the Water Quality Control Plan (Basin Plan), the antidegradation policy is binding on all of the Regional Boards (Water Quality Order 86-17, pp. 17-18).

Implementation of the state’s antidegradation policy is guided by the State Antidegradation Guidance, SWRCB Administrative Procedures Update 90-004, 2 July 1990 (“APU 90-004”) and USEPA Region IX, “Guidance on Implementing the Antidegradation Provisions of 40 CFR 131.12” (3 June 1987) (“Region IX Guidance”), as well as Water Quality Order 86-17.

The Regional Board must apply the antidegradation policy whenever it takes an action that will lower water quality (State Antidegradation Guidance, pp. 3, 5, 18, and Region IX Guidance, p. 1). Application of the policy does not depend on whether the action will actually impair beneficial uses (State Antidegradation Guidance, p. 6). Actions that trigger use of the antidegradation policy include issuance, re-issuance, and modification of NPDES and Section 404 permits and waste discharge requirements, waiver of waste discharge requirements, issuance of variances, relocation of discharges, issuance of cleanup and abatement orders, increases in discharges due to industrial production and/or municipal growth and/or other sources, exceptions from otherwise applicable water quality objectives, etc. (State Antidegradation Guidance, pp. 7-

10, Region IX Guidance, pp. 2-3). Both the state and federal policies apply to point and nonpoint source pollution (State Antidegradation Guidance p. 6, Region IX Guidance, p. 4).

The federal antidegradation regulations delineate three tiers of protection for waterbodies. Tier 1, described in 40 CFR § 131.12(a)(1), is the floor for protection of all waters of the United States (48 Fed. Reg. 51400, 51403 (8 Nov. 1983); Region IX Guidance, pp. 1-2; APU 90-004, pp. 11-12). It states that “[e]xisting instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.” Uses are “existing” if they were actually attained in the water body on or after November 28, 1975, or if the water quality is suitable to allow the use to occur, regardless of whether the use was actually designated (40 CFR § 131.3(e)). Tier 1 protections apply even to those waters already impacted by pollution and identified as impaired. In other words, already impaired waters cannot be further impaired.

Tier 2 waters are provided additional protections against unnecessary degradation in places where the levels of water quality are better than necessary to support existing uses. Tier 2 protections strictly prohibit degradation unless the state finds that a degrading activity is: 1) necessary to accommodate important economic or social development in the area, 2) water quality is adequate to protect and maintain existing beneficial uses and 3) the highest statutory and regulatory requirements and best management practices for pollution control are achieved (40 CFR § 131.12(a)(2)). Cost savings to a discharger alone, absent a demonstration by the project proponent as to how these savings are “necessary to accommodate important economic or social development in the area,” are not adequate justification for allowing reductions in water quality (Water Quality Order 86-17, p. 22; State Antidegradation Guidance, p. 13). If the waterbody passes this test and the degradation is allowed, degradation must not impair existing uses of the waterbody (48 Fed. Reg. 51403). Virtually all waterbodies in California may be Tier 2 waters since the state, like most states, applies the antidegradation policy on a parameter-by-parameter basis, rather than on a waterbody basis (APU 90-004, p. 4). Consequently, a request to discharge a particular chemical to a river, whose level of that chemical was better than the state standards, would trigger a Tier 2 antidegradation review even if the river was already impaired by other chemicals.

Tier 3 of the federal antidegradation policy states “[w]here high quality waters constitute an outstanding national resource, such as waters of national and State parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water shall be maintained and protected (40 CFR § 131.12(a)(3)). These Outstanding National Resource Waters (ONRW) are designated either because of their high quality or because they are important for another reason (48 Fed. Reg. 51403; State Antidegradation Guidance, p. 15). No degradation of water quality is allowed in these waters other than short-term, temporary changes (Id.). Accordingly, no new or increased discharges are allowed in either ONRW or tributaries to ONRW that would result in lower water quality in the ONRW (EPA Handbook, p. 4-10; State Antidegradation Guidance, p.

15). Existing antidegradation policy already dictates that if a waterbody “should be” an ONRW, or “if it can be argued that the waterbody in question deserves the same treatment [as a formally designated ONRW],” then it must be treated as such, regardless of formal designation (State Antidegradation Guidance, pp. 15-16; APU 90-004, p. 4). Thus the Regional Board is required in each antidegradation analysis to consider whether the waterbody at issue should be treated as an ONRW. It should be reiterated that waters cannot be excluded from consideration as an ONRW simply because they are already “impaired” by some constituents. By definition, waters may be “outstanding” not only because of pristine quality, but also because of recreational significance, ecological significance or other reasons (40 CFR §131.12(a)(3)). Waters need not be “high quality” for every parameter to be an ONRW (APU 90-004, p. 4). For example, Lake Tahoe is on the 303(d) list due to sediments/siltation and nutrients, and Mono Lake is listed for salinity/TDC/chlorides but both are listed as ONRW.

The State Board’s APU 90-004 specifies guidance to the Regional Boards for implementing the state and federal antidegradation policies and guidance. The guidance establishes a two-tiered process for addressing these policies and sets forth two levels of analysis: a simple analysis and a complete analysis. A simple analysis may be employed where a Regional Board determines that: 1) a reduction in water quality will be spatially localized or limited with respect to the waterbody, e.g. confined to the mixing zone; 2) a reduction in water quality is temporally limited; 3) a proposed action will produce minor effects which will not result in a significant reduction of water quality; and 4) a proposed activity has been approved in a General Plan and has been adequately subjected to the environmental and economic analysis required in an EIR. A complete antidegradation analysis is required if discharges would result in: 1) a substantial increase in mass emissions of a constituent; or 2) significant mortality, growth impairment, or reproductive impairment of resident species. Regional Boards are advised to apply stricter scrutiny to non-threshold constituents, i.e., carcinogens and other constituents that are deemed to present a risk of source magnitude at all non-zero concentrations. If a Regional Board cannot find that the above determinations can be reached, a complete analysis is required.

Even a minimal antidegradation analysis would require an examination of: 1) existing applicable water quality standards; 2) ambient conditions in receiving waters compared to standards; 3) incremental changes in constituent loading, both concentration and mass; 4) treatability; 5) best practicable treatment and control (BPTC); 6) comparison of the proposed increased loadings relative to other sources; 7) an assessment of the significance of changes in ambient water quality and 8) whether the waterbody was a ONRW. A minimal antidegradation analysis must also analyze whether: 1) such degradation is consistent with the maximum benefit to the people of the state; 2) the activity is necessary to accommodate important economic or social development in the area; 3) the highest statutory and regulatory requirements and best management practices for pollution control are achieved; and 4) resulting water quality is adequate to protect and maintain existing beneficial uses. A BPTC technology analysis must be

done on an individual constituent basis; while tertiary treatment may provide BPTC for pathogens, dissolved metals may simply pass through.

Any antidegradation analysis must comport with implementation requirements in State Board Water Quality Order 86-17, State Antidegradation Guidance, APU 90-004 and Region IX Guidance. The conclusory, unsupported, undocumented statements in the Permit are no substitute for a defensible antidegradation analysis.

The antidegradation review process is especially important in the context of waters protected by Tier 2. See EPA, Office of Water Quality Regulations and Standards, *Water Quality Standards Handbook*, 2nd ed. Chapter 4 (2nd ed. Aug. 1994). Whenever a person proposes an activity that may degrade a water protected by Tier 2, the antidegradation regulation requires a state to: (1) determine whether the degradation is “necessary to accommodate important economic or social development in the area in which the waters are located”; (2) consider less-degrading alternatives; (3) ensure that the best available pollution control measures are used to limit degradation; and (4) guarantee that, if water quality is lowered, existing uses will be fully protected. 40 CFR § 131.12(a)(2); EPA, Office of Water Quality Regulations and Standards, *Water Quality Standards Handbook*, 2nd ed. 4-1, 4-7 (2nd ed. Aug. 1994). These activity-specific determinations necessarily require that each activity be considered individually.

For example, the APU 90-004 states:

“Factors that should be considered when determining whether the discharge is necessary to accommodate social or economic development and is consistent with maximum public benefit include: a) past, present, and probably beneficial uses of the water, b) economic and social costs, tangible and intangible, of the proposed discharge compared to benefits. The economic impacts to be considered are those incurred in order to maintain existing water quality. The financial impact analysis should focus on the ability of the facility to pay for the necessary treatment. The ability to pay depends on the facility’s source of funds. In addition to demonstrating a financial impact on the publicly – or privately – owned facility, the analysis must show a significant adverse impact on the community. The long-term and short-term socioeconomic impacts of maintaining existing water quality must be considered. Examples of social and economic parameters that could be affected are employment, housing, community services, income, tax revenues and land value. To accurately assess the impact of the proposed project, the projected baseline socioeconomic profile of the affected community without the project should be compared to the projected profile with the project...EPA’s Water Quality Standards Handbook (Chapter 5) provides additional guidance in assessing financial and socioeconomic impacts”

There is nothing resembling an analysis buttressing the unsupported claim that BPTC is being provided. An increasing number of wastewater treatment plants around the country and state are employing reverse-osmosis (RO), or even RO-plus. Clearly, micro or nano filtration can be considered BPTC for wastewater discharges of impairing pollutants into critically sensitive ecological areas containing listed species that are already suffering serious degradation. If this is not the case, the antidegradation analysis must explicitly detail how and why a run-of-the-mill secondary or tertiary system that facilitate increased mass loadings of impairing constituents can be considered BPTC.

There is nothing in the Permit resembling an analysis that ensures that existing beneficial uses are protected. While the Permit identifies the constituents that are included on the 303(d) list as impairing receiving waters, it fails to discuss how and to what degree the identified beneficial uses will be additionally impacted by the discharge. Nor does the Permit analyze the incremental and cumulative impact of increased loading of non-impairing pollutants on beneficial uses. In fact, there is almost no information or discussion on the composition and health of the identified beneficial uses. Any reasonably adequate antidegradation analysis must discuss the affected beneficial uses (i.e., numbers and health of the aquatic ecosystem; extent, composition and viability of agricultural production; people depending upon these waters for water supply; extent of recreational activity; etc.) and the probable effect the discharge will have on these uses.

Alternatively, Tier 1 requires that existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. By definition, any increase in the discharge of impairing pollutants to impaired waterways unreasonably degrades beneficial uses and exceeds applicable water quality standards. Prohibition of additional mass loading of impairing pollutants is a necessary stabilization precursor to any successful effort in bringing an impaired waterbody into compliance.

The State Board has clearly articulated its position on increased mass loading of impairing pollutants. In Order WQ 90-05, the Board directed the San Francisco Regional Board on the appropriate method for establishing mass-based limits that comply with state and federal antidegradation policies. That 1990 order stated “[I]n order to comply with the federal antidegradation policy, the mass loading limits should also be revised, based on mean loading, concurrently with the adoption of revised effluent limits. The [mass] limits should be calculated by multiplying the [previous year’s] annual mean effluent concentration by the [four previous year’s] annual average flow (Order WQ 90-05, p. 78). USEPA points out, in its 12 November 1999 objection letter to the San Francisco Regional Board concerning Tosco’s Avon refinery, that ‘[a]ny increase in loading of a pollutant to a water body that is impaired because of that pollutant would presumably degrade water quality in violation of the applicable antidegradation policy.’”

The antidegradation analysis in the proposed Permit is not simply deficient, it is literally nonexistent. The brief discussion of antidegradation requirements, in the Findings and Fact Sheet, consist only of skeletal, unsupported, undocumented conclusory statements totally lacking in factual analysis. NPDES permits must include any more stringent effluent limitation necessary to implement the Regional Board Basin Plan (Water Code 13377). The Tentative Permit fails to properly implement the Basin Plan's Antidegradation Policy.

Thank you for considering these comments. If you have questions or require clarification, please don't hesitate to contact us.

Sincerely,

A handwritten signature in black ink, appearing to read "Bill Jennings". The signature is fluid and cursive, with a large initial "B" and "J".

Bill Jennings, Executive Director
California Sportfishing Protection Alliance