COMMENTS
ON
TENTATIVE WASTE DISCHARGE REQUIREMENTS
FOR
NPDES NO. CA0078671
EL DORADO IRRIGATION DISTRICT
EL DORADO HILLS WASTEWATER TREATMENT PLANT
EL DORADO COUNTY

May 22, 2007

Facility Information

(1) Page 2, Table 4. Facility Information. The plant's design capacity is defined as 3.0/4.0 mgd average daily discharge flow (ADDF). The 3.0 and 4.0 mgd flow capacities do not relate, from a design perspective, to an "average daily discharge flow" throughout the year. Rather, these flow capacities are based on "average dry weather flows." Therefore, use of the term ADDF should be changed to ADWF throughout the permit. ADWF should then be defined in the permit's Definitions section. (Also see comments # 6 and 21).

Findings

(2) Page 6, M. Stringency of Requirements for Individual Pollutants. This section states that the Regional Board has considered the factors in Water Code section 13241 in establishing new requirements in this permit. There is inadequate discussion and findings relating to the section 13241 factors in the permit and the fact sheet. As such, the permit does not adequately consider the 13241 factors when imposing limitations more stringent than federal standards. Same comment applied to the Fact Sheet.

Effluent Limitations and Discharge Specifications

(3) Page 9, 20:1 Dilution. The current permit includes 20:1 dilution limits and the District requests that these limits be retained in the renewed permit. Also, the District asks for clarification on the triggers for the applicable periods of 20:1 dilution.

(4) Page 10, Mass Limits. The District requests that the following language, consistent with other recently adopted permit (e.g., MHCSD, City of Tracy), be used for this permit, as follows:

First, add following footnote to Tables 6b and 6c:

> [1] Based on a design dry weather flow of 3.0/4.0 mgd (see Section VII.J. for procedures for compliance determination).

Second, at Section VII, add the following text as a new subsection "J:"

"J. Effluent Mass Limitations. The effluent mass limitations contained in Final Effluent Limitations section IV.A.1.a. are based on the permitted average dry weather flow, and calculated as follows:

Mass (lbs/day) = Flow (mgd) x Concentration (mg/L) x 8.34 (conversion factor).

If the effluent flow exceeds the permitted average dry weather flow due to wet-weather storm events or when groundwater is above normal and runoff is occurring, the effluent mass limitations contained in Final Effluent Limitations IV.A.1.a. shall not apply. Under these circumstances, the effluent mass limitations shall be recalculated based on the wet weather effluent flow rate occurring at that time, rather than the permitted average dry weather flow."

(5) Page 10, Tables 6b and 6c. (a) These tables contain mass-based effluent limitations for aluminum, ammonia, and copper. Mass limitations for these constituents are unnecessary as the applicable water quality criteria are expressed in terms of concentration and any effects of these constituents on downstream beneficial uses would be due to elevated concentrations, not elevated mass – hence the reason the water quality criteria are expressed in terms of concentration. The imposition of mass limitations for these constituents also contradicts the findings in the Fact Sheet, which state that "pursuant to the exceptions to mass limitations provided in 40 CFR 122.45(f)(1), some effluent limitations are not expressed in terms of mass, such as pH and temperature, and when the applicable standards are expressed in terms of concentration (e.g. CTR criteria and MCLs) and mass limitations are not necessary to protect the beneficial uses of the receiving water." See Fact Sheet at pg. F-54. There is no justification or need for mass limitations for these constituents. Therefore, the District requests that the mass limitations for aluminum, ammonia, and copper be removed from the permit.

(b) There is a second row of mass limitations for copper of 1.25 lbs/day and 1.67 lbs/day that should be deleted, as these mass limitations do not correspond to the concentration-based limitations cited for copper.

(6) Page 11, Average Daily Discharge Flow (ADDF). To be consistent with other permits issued by this region, and the plant's design capacity rating, the District requests the following text change:

"g. **Average Dry Weather ~~Daily Discharge~~ Flow (ADWDF).** The Average Dry Weather ~~Daily Discharge~~ Flow shall not exceed 3.0 mgd until completion of WWTP expansion whereupon Average Dry Weather ~~Daily Discharge~~ Flow shall not exceed 4.0 mgd."

(7) Page 11, 2.a, Interim Effluent Limitations. As currently drafted, the discharge flow cannot be increased from 3.0 to 4.0 mgd unless the District is compliant with the final effluent limitations IV.A.1, regardless of the compliance schedule for constituents that are contained elsewhere in the tentative Order. The District does not support the tentative Order's provision requiring compliance with the final effluent limitations for an increase in permitted discharge flow. A decision to allow the increase in discharge is unrelated to compliance with the final effluent limitations, which is controlled by the compliance schedule provisions contained in the tentative Order. The district requests the following edits:

"a. During the period beginning with the permit effective date and ending on 17 May 2010, the Discharger shall maintain compliance with the following limitations at Discharge Point 001, with compliance measured at Monitoring Location EFF-001 as described in the attached MRP. These interim effluent limitations shall only apply in lieu of the corresponding final effluent limitations specified for the same parameters during the time period indicated in this provision. ~~Interim limitations only apply to an effluent flow of 3.0 mgd ADDF. Upon completion of construction of WWTP expansion to 4.0 mgd ADDF final effluent limitations apply per Section IV.A.1.~~"

(8) Page 12, Compliance Schedules. The District requested a 5-year compliance schedule for Bis (2-chloroethyl) ether, Bis (2-ethylhexyl) phthalate, and carbon tetrachloride, as well as for chlorinated hydrocarbon pesticides and aluminum. The five year compliance schedule was granted for chlorinated hydrocarbon pesticides and aluminum, but not for the above-cited organic compounds. In addition, the District requested a 4–year compliance schedule for copper and zinc. The Tentative Permit provides for only 3 years for Bis (2-chloroethyl) ether, Bis (2-ethylhexyl) phthalate, carbon tetrachloride, copper, and zinc.

The District requests that a Time Schedule Order be adopted in concurrence with the permit to provide the time justified in the Infeasibility Analysis for the above-cited constituents.

Receiving Water Limitations

(9) Page 14, 9. Pesticides, c. The District requests the following edit to this language:

"c. Total identifiable persistent chlorinated hydrocarbon pesticides to be present in the water column at concentrations detectable within the accuracy of analytical methods approved by USEPA or the Executive Officer*/*prescribed in *Standard Methods for the Examination of Water and Wastewater, 18th Edition or latest edition*, methods defined in 40 CFR 126, or other equivalent methods approved by the Executive Officer."

(10) Page. 16, Groundwater Limitations. The justification for the ammonia limit is not clearly stated. There is no agriculture goal/criterion or MUN drinking water MCL for ammonia. If the limit is based on EU Council Directive 98/83/EC, "On the Quality of Water Intended for Human Consumption, see SWRCB Order No. Order WQO 2002-0015 (p. 47). This Order states, in part, "The EU regulations explain that the value is intended to be used for monitoring purposes and as an indicator parameter. If the value is exceeded, the EU member states are directed to consider whether non-compliance poses any human health risk." Groundwater limitations for nitrite + nitrate are provided to protect human health for nitrogen compounds. This ammonia limitation is inappropriate and unnecessary. We request that it be deleted.

Provisions

(11) Page 24, Item iii. Numeric Monitoring Trigger and Page E-6, V. B. 5. Methods. The description of statistical analyses to determine chronic toxicity is misleading. Only Appendix H is referenced while other portions of the referenced method are also directly applicable. For example, Section 10.2.8.2 (page 51) of the Test Method provides guidance on test variability and "[w]hen NPDES permits require sublethal hypothesis testing endpoints..., within-test variability must be reviewed and variability criteria must be applied as described in this section (10.2.8.2)." In addition, other modifications are warranted. The District requests the following modification to this text:

> "**iii. Numeric Monitoring Trigger**. The numeric toxicity monitoring trigger is a statistically significant ~~difference~~ reduction~~between~~ in the 100% effluent test concentration response relative to ~~and~~ the laboratory control test response. The toxicity threshold that determines a statistically significant difference between the two tests mentioned above is established in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition*, EPA/821-R-02-013, October 2002 (Appendix H)), and its subsequent amendments or revisions. Determination of statistical significance is subject to a review of test variability as detailed in section 10.2.8.2 of the Test Method (page 51). The monitoring trigger is not an effluent limitation; it is the toxicity threshold at which the Discharger is required to begin accelerated monitoring and initiate a TRE."

(12) Page 25-26, Item b, Constituent Study – Selenium and Nitrite. This provision states that the discharge has the potential to cause or contribute to an exceedance of a water quality standard for selenium and nitrite and requires a two year study of these constituents.

Selenium concentrations in the effluent have been monitored monthly from March 2001 to February 2002, and quarterly from November 2002 to present for a total of 23 samples. The maximum detected concentration was 3.7 µg/L (total recoverable, estimated below the reporting limit) and the maximum reporting limit was 5.0 µg/L. Concentrations have been below the lowest applicable water quality criterion of 5.0 µg/L (total recoverable), which is the CTR criterion for chronic protection of aquatic life. This data set is sufficient to assess reasonable potential for the selenium criterion to be exceeded. Furthermore, selenium will be monitored annually as part of the required monitoring for priority pollutants. Thus, the District requests that the provision for conducting a study for selenium be deleted from the permit.

Nitrite concentrations in the effluent have been monitored monthly from March 2001 to February 2002, and again in May 2002 for a total of 13 samples. The maximum detected concentration was 0.95 mg/L-N and the maximum reporting limit was 0.5 mg/L-N. These concentrations are below the lowest applicable water quality criterion of 1.0 mg/L-N, which is the DHS MCL. The data collected to date are sufficient to assess reasonable potential for the nitrite criterion to be exceeded and, thus, the District requests that the provision for conducting a study for nitrite be deleted from the permit.

(13) Page 26, 2c – Special Studies. BPTC. This study is being required under the auspices of potential groundwater contamination and Resolution 68-16, the state's antidegradation policy. First, Section 5 (p. 28) of the RBI report title: ANTIDEGRADATION ANALYSIS FOR THE EL

DORADO HILLS WASTEWATER TREATMENT PLANT, issued April 2007, addresses BPTC for this facility. Section 5.2 (Findings) of the RBI report states:

> *"Because the EDHWWTP is an advanced treatment plant that produced Title 22 quality, tertiary treated effluent suitable for unrestricted reuse, because the plant is operated to maximize the use of recycled water and minimize discharges to surface waters and will continue to do so in the future, because the plant's facilities and effluent quality meet or exceed the regulations discussed in Section 5.1, and because current and future expected operations of the plant will achieve compliance with NPDES permit requirements, thereby assuring a water quality nuisance will not occur and the highest water quality consistent with maximum benefit to the people of the region and the state will be maintained, it is determined that the current and planned future facilities and operations of the EDHWWTP are consistent with BPTC as it is defined and intended in Resolution No. 68-16."*

Second, no evidence has been produced to date to indicate that this facility is contaminating groundwater. Therefore, conducting this study "…*with respect to BPTC and minimizing the discharge's impact on groundwater quality*." is premature and unwarranted at this time. Whether such a BPTC study will be warranted will not be determined until completion of the groundwater monitoring evaluation, required on p. 27, subsection d of the Tentative Order. The District requests that the BPTC study requirement (subsection c, p. 26) be removed from the Tentative Order.

Paragraph #3 under "d. Groundwater Monitoring," p. 27 of the permit states:

> *"If the monitoring shows that any constituent concentrations are increased above background water quality, the Discharger shall submit a technical report by 30 months after the effective date of this Order describing the groundwater technical report results and critiquing each evaluated component of the Facility with respect to BPTC and minimizing the discharge's impact on groundwater quality."*

This requirement adequately and appropriately addresses any future need for a BPTC study.

(14) Page 30, Item 4.b. Ultraviolet Disinfection (UV) System Operating Requirements. UV disinfection operations criteria listed are specific to recycled water distribution and are not required for stream discharge. This section of the permit does not make the distinction between discharge to surface water and use of recycled water. For example if the District only discharged, then the UV system would not be required to have NWRI / DHS Title 22 approval and would be considerably different in design and may not meet any or all of the Title 22 requirements listed in this permit section. The District requests that the requirements for dosing, UVT, and lamp life be deleted from this section. The permit can only specify effluent limitations (e.g., coliform limits) for discharges to surface waters and cannot specify the manner of treatment.

Regional Water Board may establish applicable water quality based effluent limitations, but do not have the legal authority to prescribe the treatment process (Water Code § 13360(a).) This language prescribes treatment process and thus the District requests that it, and all similar language, be deleted from the permit. If maintained, the District requests the following edits to the section.

> "b. **Ultraviolet Disinfection (UV) System Operating Requirements.** Once in operation the Discharger shall operate the UV disinfection system to provide a

minimum UV dose per bank of 100 millijoules per square centimeter (mJ/cm2) at peak daily flow for recycled water, unless otherwise approved by the California Department of Health Services, and shall always maintain an adequate dose for disinfection while discharging to Carson Creek. ~~unless otherwise approved by the California Department of Health Services.~~

i. The Discharger shall provide continuous, reliable monitoring of flow, UV transmittance, UV power, and turbidity.

ii. The UV transmittance (at 254 nanometers) in the wastewater exiting the UV disinfection system shall not fall below 55 percent of maximum at any time.

iii. The quartz sleeves and cleaning system components must be visually inspected per the manufacturer's operations manual ~~every 3 months~~ for physical wear (scoring, solarization, seal leaks, cleaning fluid levels, etc.) and to check the efficacy of the cleaning system.

iv. The lamp sleeves must be cleaned periodically, as necessary, to meet the requirements specified in paragraph iii.~~iv. The lamp cleaning fluid must be replaced every six months~~.

v. Lamps must be replaced ~~after they have reached 5000 hours of operation, or sooner~~ per the manufacturer's operations manual if there are indications the lamps ~~is~~are failing to provide adequate disinfection. Lamp age and lamp replacement records must be maintained.

vi. The facility must be operated in accordance with an operations and maintenance program that assures adequate disinfection. ~~manual approved by the Regional Board and DHS.~~"

(15) Page 31, 5, a. Pretreatment Requirements. The District is currently working with U.S. EPA to obtain an approved Industrial Pretreatment Program (IPP). We request that the status of our IPP be acknowledged here (p. 31, 5, a. i) so as to prevent being in violation of this aspect of the Order should obtaining EPA's final approval occur after the effective date of this Order. The District requests the following edits t this section.

"5. Special Provisions for Municipal Facilities (POTWs Only)

a. **Pretreatment Requirements.**

i. The Discharger shall implement its ~~approved~~ pretreatment program, in accordance with U.S. EPA's approvals, and the program shall be an enforceable condition of this Order. If the Discharger fails to perform the pretreatment functions, the Regional Water Board, the State Water Board or the U.S. Environmental Protection Agency (U.S. EPA) may take enforcement actions against the Discharger as authorized by the CWA."

(16) Page 34, e, 2nd paragraph. Because the District has obtained coverage under Order 2006-0003, the requirements identified in this paragraph are addressed under that Order and thus should be removed from this Order.

(17) Page 34, e, 3rd paragraph. It should be noted that no portion of the wastewater collection system is outside the service area of the Discharger. The first sentence of the third paragraph should be deleted.

(18) Page 35, Item 6.a., Other Special Provisions. Comment #14 applies here too. The requirement for compliance with Title 22 should only pertain to recycled water and not discharge.

"6. Other Special Provisions
a. Wastewater shall be oxidized, coagulated, filtered, and adequately disinfected pursuant to the DHS reclamation criteria for recycled water, California Code of Regulations, Title 22, Division 4, Chapter 3, (Title 22), or equivalent for effluent discharged to Carson Creek."

(19) Page 35, VI.C.7.a. Compliance Schedules. Some of the compliance schedules specified in this section of the permit are consistent with the District's request in its Infeasibility Analysis, submitted December 2006, and others (i.e., Bis (2-chloroethyl) ether, Bis (2-ethylhexyl) phthalate, and carbon tetrachloride, copper and zinc) are shorter than requested. Because Board staff have not informed the District that their Infeasibility Analysis was deficient in any way, or that the compliance schedules requested for the above-cited constituents are excessive, the District requests that time schedules consistent with that requested in the Infeasibility Analysis be provided for all constituents. This will likely require issuance of a Time Schedule Order to provide the time requested, beyond that which can be provided in the NPDES permit, for the above-cited constituents.

Compliance Determination

(20) Page 38, G. Average Daily Discharge Flow Effluent Limitations. (section IV.A.1.g). The District requests that this section be modified as follows:

> "G. **Average Dry Weather ~~Daily Discharge~~ Flow Effluent Limitations (Section IV.A.1.g.)**. The Average Dry Weather ~~Daily Discharge~~ Flow represents the daily average flow when groundwater is at or near normal and runoff is not occurring. Compliance with the Average Dry Weather ~~Daily Discharge~~ Flow effluent limitations will be measured annually based on the average daily flow over three consecutive dry weather months (e.g. July, August, and September) at times when groundwater is at or near normal and runoff is not occurring."

Attachment A – Definitions

(21) Page A-1. p. 11, item G uses "average daily discharge flow (ADDF) to set flow restrictions on this facility. This needs to be changed to "average dry weather flow," based on comments made above, and a definition of ADWF added to the Definitions section of the permit.

Attachment E – Monitoring and Reporting Program

(22) Page E-3, Table E-3, Effluent Monitoring. Bimonthly monitoring is specified for a number of constituents (see p. E-4) because the reporting limit and/or method detection limit was greater than the lowest applicable criterion. Statements on Page F-66 of the Fact Sheet suggest that the SIP requires this monitoring in this circumstance. The full text of the SIP language cited is provided below with emphasis added:

> "If data are unavailable or insufficient, as described in section 1.2, to conduct the above analysis for the pollutant, or if all reported detection limits of the pollutant in the effluent are greater than or equal to the C value, the RWQCB shall require additional monitoring for the pollutant in place of a water quality-based effluent limitation. Upon completion of the required monitoring, the RWQCB shall use the gathered data to conduct the analysis in Steps 1 through 7 above and determine if a water quality-based effluent limitation is required. If, upon completion of the monitoring required by Step 8 and the subsequent analysis in Steps 1 through 7, a specific pollutant was not detected in any effluent or if ambient background sample and applicable detection limits are greater than or equal to the C value, the RWQCB may require periodic monitoring of the pollutant."

Monitoring for the constituents listed in Table E-3 (and Table F-19, p. F-66) has already been conducted in accordance with Regional Water Board reporting limit requirements specified in its "13267" letter sent to the District in September 2001. The fact that the reporting limits and/or method detection limits are higher than the criteria is not due to inadequate monitoring or analysis, but because these constituents have very low criteria. Requiring bimonthly monitoring for such constituents is inconsistent with permits adopted by the Region 5 Board as recently as May 3 and 4, 2007. As such, the District requests that the monitoring requirement be reduced to once per year consistent with the timing of the priority pollutant sampling.

(23) Page E-3, Table E-3, Effluent Monitoring. (a) Because of the consistency in effluent quality for BOD, TSS, total coliform bacteria, and settleable solids, the District requests that the 1/day monitoring for these constituents be reduced to 5 days/week for the effluent and influent monitoring.

(b) The District requests the ability to collect samples for monitoring total coliform bacteria to be collected at the outlet from the chlorine contact basins, prior to dechlorination.

(c) Constituents in this table, from copper through aluminum, have a specified monitoring frequency of 1/week. This weekly frequency is excessive and is inconsistent with the monthly frequency normally requested by this Board. For example, monthly monitoring was required for the Mountain House Community Services District, for its "reasonable potential" constituents, in its renewed 5.4 mgd permit adopted on May 4, 2007. The District requests that the frequency of monitoring for these constituents be changed from weekly to monthly.

(d) Table E-3 also requires continuous monitoring for temperature, pH, turbidity, and dissolved oxygen. The District does not object to the continuous requirement for turbidity, but does object to continuous recording requirements for temperature, pH, and dissolved oxygen. District staff are unaware of methods to provide continuous recording of temperature, pH, and dissolved oxygen that meet standardized, EPA approved methods. Despite not meeting an EPA approved methodology,

this requirement would obligate the District to install continuous monitoring devices for temperature, pH, and dissolved oxygen. Moreover, it is unnecessary to have continuous recording on temperature, pH, and dissolved oxygen because, unlike turbidity, they provide no insight into plant process control. The District requests that the continuous recording requirements for temperature, pH, and dissolved oxygen be changed to daily grab samples.

(24) Page E-6, Item A.4, Methods. The District requests the following modification to the text to account for future updates to the specified method:

> "4. Methods - The acute toxicity testing samples shall be analyzed using EPA-821-R-02-012, Fifth Edition, and its subsequent amendments or revisions."

(25) Page E-7, Item B.5, Methods. The District requests the following modification to the text to account for future updates to the specified method:

> "The presence of chronic toxicity shall be estimated using statistical analyses specified in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition*, EPA/821-R-02-013, October 2002 (Appendix H), and its subsequent amendments or revisions."

(26) Page E-7, Item B.5, Methods. The description of statistical analyses to determine chronic toxicity is misleading. Only Appendix H is referenced while other portions of the referenced method are also directly applicable. For example, Section 10.2.8.2 (page 51) of the Test Method provides guidance on test variability and "[w]hen NPDES permits require sublethal hypothesis testing endpoints..., within-test variability must be reviewed and variability criteria must be applied as described in this section (10.2.8.2)." Therefore the text should be modified as follows:

> "5. *Methods* – The presence of chronic toxicity shall be estimated using statistical analyses specified in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition,* EPA/821- R-02-013, October 2002 (Appendix H), and determination of statistical significance is subject to a review of test variability as detailed in section 10.2.8.2 of the Test Method (page 51)."

(27) Page E-6, Item V. B. Chronic Toxicity Testing and Page E-7, V. B. 7. Dilutions. The EDHWWTP does not have a history of toxicity in its chronic 3-species bioassays, Hence, changing from the existing quarterly testing frequency to monthly is unwarranted. Also, it should be noted that EPA guidance does not favor a single point pass/fail toxicity test (see page 5 and page 36 of the Test Method). While greater frequency can be achieved with single point monthly testing at similar costs to quarterly dilution series testing, much toxicological information is lost.

> "The concept of concentration-response, or more classically, a dose-response relationship is 'the most fundamental and pervasive one in toxicology' (Casarett and Doull, 1975)… A corollary of the concentration-response concept is that every toxicant should exhibit a concentration-response relationship, given that the appropriate response is measured and given that the concentration range evaluated is appropriate. Use of this concept can be helpful in determining whether an effluent possesses toxicity and in identifying anomalous test results." (page 50 of the Test Method)

Consideration of the information lost in "pass/fail" testing that lack serial dilutions and the fact that the increased testing frequency (from quarterly to monthly) is unfounded, the District requests that that the 3-species bioassay testing frequency be returned to its existing quarterly frequency, without the serial dilutions, but that any accelerated monitoring be performed with lab water serial dilutions (100%, 85%, 75%, 50%, and 25% effluent). The suggested dilution series is a modification of the EPA recommended series because the discharge is to an ephemeral creek. Evaluation of the dose-response curve is particularly relevant when a TRE may be initiated based on the results (i.e. during accelerated monitoring) and to determine if the toxicity present is of sufficient magnitude for a TIE study to be practicable.

In addition, there is an incorrect reference to Table E-5 instead of E-4. If pathogen related mortality (PRM) is observed, particularly with the fathead minnow tests (*Pimephales promelas)*, the receiving water sample would provide another point of comparison on the prevalence of PRM.

The District requests the following modifications:

1. *Monitoring Frequency* – the Discharger shall perform quarterly ~~monthly~~ three species chronic toxicity testing during periods of discharge to Carson Creek.

7. *Dilutions* – The Discharger is subject to different dilution requirements depending on the monitoring phase:

a. The regular chronic toxicity testing shall be performed using the dilution series identified in ~~Table E-5~~ Table E-4, below. Due to low flow in the receiving water no dilution credit is allowed. Therefore, toxicity of the undiluted effluent is of particular interest. ~~As such, no serial dilutions of the effluent need to be tested~~. The receiving water is included in the test matrix to determine its toxicity and, if pathogen related mortality (PRM) is observed in the effluent, the receiving water may provide a relevant comparison.

b. The accelerated monitoring chronic toxicity testing shall be performed using the dilution series identified in Table E-5, below.

Table E-5. Accelerated Monitoring Chronic Toxicity Testing Dilution Series

	Dilutions (%)					Controls (%)	
Sample	100	85	75	50	25	Laboratory Water	Receiving Water
% Effluent	100	85	75	50	25	0	0
% Laboratory Water	0	15	25	50	75	100	0
% Receiving Water	0	0	0	0	0	0	100

(28) Page E-7, Item V. B. 8. b. There is a factual error in the reference made at the end of this section. The text should be modified as follows:

"b. The percent minimum significant difference (PMSD) measured for the test exceeds the upper PMSD bound variability criterion in Table 6 on page 52 of the Method Manual. (A retest is only required in this case if the test results do not exceed the monitoring trigger specified in Special Provisions VI.C.2.a.iii.)"

(29) Page E-9, Item A.1., Receiving Water Monitoring Requirements. The monitoring and reporting program requires monitoring of Carson Creek when there is no discharge occurring. No rationale is provided for requiring monitoring when no discharge is occurring. Page F-68 of the Fact Sheet states:

> "Receiving water monitoring is necessary to assess compliance with receiving water limitations and to assess the impacts of the discharge on the receiving stream."

When there is no discharge to Carson Creek, there can be no impact to Carson Creek, thus no need to assess compliance. As such, the District requests the monitoring of Carson Creek only be required when discharge is occurring.

(30) Page E-10, Table E-6a. Surface Water Monitoring Requirements. Footnote #4 is not applicable to this table and, therefore, should be deleted.

(31) Page E-10, Table E-6b. Groundwater Monitoring Requirements. As stated in a previous comment, the ammonia monitoring requirement for groundwater should be deleted.

(32) Page E-19, d. Industrial Users. Federal regulations (403.12(i)(5)) require annual monitoring for this purpose. The District believes that the quarterly monitoring and reporting requirement specified here is excessive and thus requests that it be reduced to annual to be consistent with federal regulations.

Attachment F – Fact Sheet

(34) Page F-17, c. Assimilative Capacity/Mixing Zone. The following statement in the 3rd paragraph is incorrect and should be deleted, "*However, new water quality based effluent limits established in this Order for metals such as zinc, aluminum, copper, and manganese require tertiary level of treatment.*" Actions to achieve compliance with effluent limitations for these metals may include water-effect ratio studies, translator studies, or source control. The need for tertiary treatment is based on the permit's findings regarding pathogens (see Fact Sheet p. F-34), not metals treatment and removal.

(34) Page F-18, Determining Need for WQBELS, item b. The paragraph should be modified as follows:

> "Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs, the Regional Water Board finds that the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for settleable solids, pH, nitrate, ~~iron, manganese,~~ chlorine residual, temperature, turbidity, total coliform, aluminum, ammonia, bis (2-Chloroethyl) ether, bis (2-ethylhexyl) phthalate, carbon tetrachloride, copper, cyanide, dibromochloromethane, dichlorobromomethane, specific conductance (EC), persistent chlorinated hydrocarbon pesticides, total trihalomethanes, and zinc. Furthermore, concentrations of iron and manganese in Carson Creek have exceeded applicable water quality objectives. Therefore, w~~W~~ater quality-based effluent limitations (WQBELs) for these constituents are included in this Order."

As described on page F-30, effluent concentrations of iron and manganese have been below water quality objectives and, thus, the discharge does not pose a reasonable potential to cause or contribute to an in-stream excursion of a water quality standard for these metals. The reason for the effluent limitations is the SIP's requirement that limitations be issued when the background receiving water concentration has exceeded objectives and the constituent has been detected in the effluent.

(35) Page 18, e. Aluminum. Because there is no adopted water quality criteria/objective for aluminum in California, Board staff have issued effluent limits for aluminum based on "best professional judgment" to interpret and uphold the narrative toxicity objective in the Basin Plan. Board staff's application of "best professional judgment" is commented on below.

Board staff turned to U.S. EPA's Section 304(a) National Recommended Water Quality Criteria for Aluminum – 2002 (EPA-822-R-02-047). However, staff have not correctly interpreted U.S. EPA's recommended criteria for the purposes of establishing effluent limitations for aluminum for the EDHWWTP, based on site-specific effluent and receiving water conditions. Because the receiving water hardness is expected to always be above 52 mg/L as $CaCO_3$ (see Fact Sheet, p. F-16) the U.S. EPA's recommended 87 μg/L chronic aquatic life criteria used as the basis for the effluent limitation in the Tentative Order is not appropriate. Mr. Charles Delos of U.S. EPA Headquarters issued a letter to Central Valley Board staff and Dr. Bryan of RBI, dated December 19, 2003, to clarify the appropriate use of EPA's recommended aluminum criteria for the purposes of establishing effluent limits in Central Valley NPDES permit. The following is an important excerpt from this letter.

"…EPA's 1988 chronic aluminum criterion, 87 ug/L, is based on two tests, one with brook trout and one with striped bass, at low hardness (10 - 12 mg/L) and low pH (6.5 - 6.6 SU). This value is considered to be necessary for protecting waters having such low hardness and pH. However, this value is expected to be overly protective when applied to waters of moderate hardness and pH. Many such waters are known to exceed this value while fully attaining the goals of the Clean Water Act.

Based on data for a diversity of species tested at hardness in the range of 45 – 220 mg/L and pH in the range of 6.5 - 8.3, the 1988 document notes that the chronic criterion would be determined to be 750 ug/L." (emphasis added) (see also *p.* 6 of the original U.S. EPA 1988 Aluminum criteria document (EPA 440/5-86-008), from which EPA's 2002 recommended aluminum criteria are taken (Attachment 2), as the basis for this latter statement in the Delos letter).

Failure by Board staff to properly interpret U.S. EPA's recommended criteria document for aluminum and to acknowledge and follow U.S. EPA Headquarters specific direction for interpretation and application of its recommended aluminum criteria for purpose of establishing NPDES limits for aluminum does not represent "best professional judgment." Best professional judgment here determines that both the acute and chronic EPA recommended aluminum criteria applicable to this site is 750 ug/l. The 87 ug/l criterion is not applicable based on this site's hardness (i.e., typically 52 to 110 mg/l (as CaCO3; See Fact Sheet, p. F-18 and F-19).

Second, In May 2006, a report titled: *Evaluation of the EPA Recalculation Procedure in the Arid West Technical Report* was published. This report was funded by U.S. EPA Region IX, prepared by Parametrix, Inc., Chadwick Ecological Consultants, and URS Corporation, and directed by the Pima County Wastewater Management Department. The Arid West Water Quality Research Project was established in 1995 as a result of a federal appropriation (Public Law 103-327) and the establishment of an Assistance Agreement between the U.S. Environmental Protection Agency (USEPA) and Pima County Wastewater Management (PCWMD), Tucson, Arizona. The establishment of this Agreement provided a significant opportunity for western water resource stakeholders to: 1) work cooperatively to conduct scientific research to recommend appropriate water quality criteria, standards and uses for effluent-dependent and ephemeral waters in the arid and semi-arid regions of the West ("arid Wes"), and 2) improve the scientific basis for regulating wastewater and stormwater discharges in the arid West.

This Technical Report updated the data base on the environmental significance of freshwater organism aluminum exposure and available toxicity studies, relative to that used by U.S. EPA in its 1988 aluminum criteria document. Section 3 of this report summarizes the status of the technical review of the freshwater aluminum AWQC and provides a recalculation of the aluminum AWQC based on the expanded data set. The results of this effort are summarized in Table 3-8 of the report, which is provided below.

Table 3-8. Updated and Revised Acute and Chronic Al Criterion Value Across Selected Hardness Values

	Mean Hardness (mg/L as $CaCO_3$)									
Equations	25	50	75	100	150	200	250	300	350	400
Updated/Revised National Standards										
Acute Al Criterion $e^{(0.8327\ [\ln\ (\text{hardness})]+3.8971)}$	719	1,280	1,794	2,280	3,195	4,060	4,889	5,691	6,470	7,231
Chronic Al Criterion $e^{(0.8327\ [\ln\ (\text{hardness})]+2.9800}$	287	512	717	911	1,277	1,623	1,954	2,275	2,586	2,890

NOTE: All values are as µg Total Aluminum/L.

Board staff made no effort to obtain updated information such as this report that would assist in their best professional judgment determination for establishing an appropriate aluminum effluent limitation. Failure to consider updated information does not represent "best professional judgment."

Third, it should be noted that U.S. EPA's 2002 recommended criteria for aluminum (which is the same as the original 1988 recommended criteria) include several footnotes associated with the chronic criterion. Footnote "L" reads as follows:

> *L. There are three major reasons why the use of Water Effect Ratios might be appropriate. (1) The value of 87 ug/L is based on a toxicity test with the striped bass in water with pH – 6.5-6.6 and hardness <10 mg/L. Data in "Aluminum Water-Effect Ratio for the 3M Plant Effluent Discharge, Middleway, West Virginia" (May*

1994) indicate that aluminum is substantially less toxic at higher pH and hardness, but the effects of pH and hardness, are not well quantified at this time. (2) In tests with the brook trout at low pH and hardness, effects increased with increasing concentrations of total aluminum even though the concentration of dissolved aluminum was constant, indicating that total recoverable is more appropriate measurement than dissolved, at least when particulate aluminum is primarily aluminum hydroxide particles. In surface waters, however, the total recoverable procedure might measure aluminum associated with clay particles, which might be less toxic than aluminum associated with aluminum hydroxide. (3) EPA is aware of field data indicating that many high quality waters in the U.S. contain more than 87 µg aluminum/L, when either total recoverable or dissolved is measured.

A number of communities in the Central Valley (i.e., Manteca, Modesto, and Yuba City) have undertaken water effect ratio studies for aluminum in response to aluminum effluent limits adopted in their NPDES permits. Preliminary results from these studies indicate that water-effect ratios derived from individual tests for aluminum range from a low of about 23 to a high of greater than 200. Water-effect ratio adjusted criteria based on these findings (i.e., minimum WER value for Discharger x 87 µg/l) would range from approximately 1,975 ug/l to 6,925 ug/l (Cities of Manteca, Modesto, and Yuba City; unpublished data).

The weight of evidence of the aluminum water-effect ratio tests performed to date by other communities further confirms the statements made in the U.S. EPA Headquarters letter to Central Valley staff dated December 19, 2003.

Failure by Board staff to identify and utilize available water-effect ratio information for aluminum from the Central Valley or elsewhere <u>does not</u> represent "best professional judgment." In short, best professional judgment indicates that, with possible rare exceptions (and the EDHWWTP and its receiving water Carson Creek not being such an exception), aluminum toxicity to aquatic life is not an issue of concern in Central Valley receiving waters or effluents.

Given the comparisons in effluent and receiving water hardness and pH for the District's receiving water and effluent compared to that documented for Modesto, Manteca and Yuba City, it is fully expected that water-effect ratio studies for aluminum, should they be performed by the District, would yield similar findings (i.e. no aluminum toxicity, effluent limits in the thousands).

A secondary MCL of 200 µg/L exists for aluminum and is incorporated into the Basin Plan by reference. As part of objectively developing and applying best professional judgment, if permitting staff acknowledged: (a) the appropriate EPA recommended criteria of 750 ug/l (both acute and chronic, as explained in the Delos letter); (b) the updated "Arid West Technical Report" recalculated values for 50 mg/l hardness of 1,280 ug/l for acute and 512 ug/l for chronic, and (c) results from aluminum water-effect ratio studies from area dischargers, the secondary MCL would control the NPDES permit effluent limit calculations, not the aquatic life criteria.

The secondary MCL for aluminum is based on problems with color, scaling and sedimentation. In a recent letter from Mr. Carl Lischeske of DHS to Mr. Landau of the Regional Board, dated April 10, 2007 (Attachment 3), DHS stated that secondary MCLs should be applied using dissolved forms.

Dissolved aluminum values typically remain below 200 µg/l. In addressing the MCL, application of harmonic mean dilution in setting effluent limits would be appropriate.

Finally, as stated in the EPA's 1988 aluminum criteria document (p. 10-11), the acid-soluble measurement is the best form of measurement for implementation of recommended total aluminum criteria for the protection of aquatic life. Hence, this measurement serves both the MCL (see DHS C. Lischeske letter to K. Landau dated April 10, 2007, and the aquatic life criteria.

Based on the information presented here, the District requests that the permit limitations based on an 87 ug/l aquatic life criterion (monthly average of 59 ug/l and maximum daily of 161 ug/l) be removed from the permit because they cannot be justified based on best professional judgment, and that an annual average dissolved aluminum (acid soluble measurement) effluent limitation of 200 ug/l be permitted instead, which would be protective of both the MUN and aquatic life beneficial uses. If staff seek an additional limitation for the acute protection of aquatic life, best available information indicates that this limitation would be 1,280 ug/l for this site. However, because there is no reasonable potential to exceed this value, the limitation is not needed.

(36) Page F-21 (f. Ammonia) and F-49 (Table F-7, Ammonia). The Fact Sheet concludes that because there is no prohibition on discharges during the summer months, the ammonia limitation must be derived using a potential worst-case summer temperature. This approach results in overly stringent limitations that are unnecessary for the protection of beneficial uses. The EDHWWTP typically does not discharge during the months of June through October due to reclaim operations. Because of the seasonal nature of the discharge to Carson Creek, the District requests the equation-based ammonia limitations contained in Order R5-01-135 be used. At a minimum, the District requests that seasonal ammonia limitations be provided for the periods November – May when discharge typically occurs and June – October when discharge typically does not occur. Both approaches would be protective of beneficial uses.

Furthermore, the EPA recommended chronic criterion expressed for ammonia as 30-day average concentrations should be converted to a 4-day criteria criterion continuous concentration (CCC) before calculating the Average Monthly Effluent Limit (AMEL). The procedures for calculating effluent limitations described in the SIP are based largely on the EPA Technical Support Document (TSD) procedures (EPA/505/2-90-001, March 1991). The TSD procedures, in turn, define the basis of chronic effects as the 4-day exposure period (TSD, p. 99). Based on review of Table F-7, it appears that the EPA 30-day criteria were not converted to 4-day criteria, as required. The 4-day average should not exceed 2.5 times the CCC (EPA-822-R-99-014, December 1999).

For the November –May period, using the maximum observed 30-day average effluent temperature cited in the Fact Sheet of 66.7ºF (19.3ºC) and maximum allowable effluent pH of 8.5, the chronic (30-day) and acute (1-hour) ammonia criteria are 0.80 mg/L-N and 2.14 mg/L-N, respectively. For the June-October period, using the maximum observed daily effluent temperature cited in the Fact Sheet of 78.3 °F (25.7°C) and maximum allowable effluent pH of 8.5, the chronic (30-day) and acute (1-hour) ammonia criteria are, as cited in the Fact Sheet, 0.53 mg/L-N and 2.14 mg/L-N, respectively. Multiplying the 30-day CCC by 2.5 results in 4-day average criteria of 1.32 mg/L-N (June-October) and 2.00 mg/L-N (November-May). In running these values through the SIP procedures (below), the acute criterion becomes the limiting factor for calculating the effluent

limitations, thus, the AMEL and maximum daily effluent limitation (MDEL) are the same for the June-October period and the November-May period, because the acute criterion is a function of pH only, not temperature. The limitations calculated are summarized below.

WQBEL Calculations for Ammonia

	June – October		November – May	
	Acute	Chronic	Acute	Chronic
pH	8.5	8.5	8.5	8.5
Temperature	N/A	25.7	N/A	19.3
Criteria (mg/L)	2.14	1.32	2.14	2.00
Dilution Credit	0	0	0	0
ECA	2.14	1.32	2.14	2.00
ECA Multiplier	0.321	0.527	0.321	0.527
LTA	0.687	0.696	0.687	1.05
AMEL Multiplier (95%)	1.552		1.552	
AMEL	**1.07**		**1.07**	
MDEL Multiplier (99%)	3.114		3.114	
MDEL	**3.33**		**3.33**	

The District requests the ammonia limitations be modified to the AMEL and MDEL provided above.

(37) Page F-46/47, b. Effluent Limitation Calculations. The presentation of the equations for the effluent concentration allowance (ECA) is misleading. ECA_{acute} and $ECA_{chronic}$ are shown as being directly equal to the CMC and CCC, respectively, whereas the ECA_{HH} equation is shown to have a dilution credit allowance. Furthermore, the sentence above the ECA_{HH} equation implies that dilution credit is only applicable to "human health, agriculture, or other long-term criterion/objective." Dilution credit may be applied to aquatic life criteria-based ECAs, as provided for in the general equation for calculating ECAs on p. 8 of the SIP: $ECA = C + D(C-B)$. Therefore, the text and equations for the ECA_{acute} and $ECA_{chronic}$ should be modified as follows:

> "B. Effluent Limitation Calculations. In calculating maximum effluent limitations, ~~the effluent concentration allowances were set equal to the criteria/standards/objectives.~~ the ECA is calculated as follows:
>
> $ECA_{acute} = CMC$ + $D(CMC-B)$; and
> $ECA_{chronic} = CCC$ + $D(CCC-B)$
>
> For the human health, agriculture, or other long-term criterion/objective, ~~a dilution credit can be applied. T~~the ECA is calculated as follows:"

Then on p. 47, the following additional text corrections are requested:

> "Carson Creek, the receiving water ~~w~~has been determined to be an ephemeral stream. Therefore, no dilution credit is allowed (D=0). Therefore, ECA_{acute} = CMC, $ECA_{chronic}$ = CCC, and ECA_{HH} = HH for all calculations ~~regarding human health, agriculture, or other long-term criterion/objective~~."

(38) Page F-54, 2. Averaging Periods for Effluent Limitations. In the 12th line of this paragraph, manganese should be deleted. Manganese does not have a maximum daily effluent limitation.

(39) Page F-55, Item 4. Satisfaction of Antidegradation Policy and Page F-55/F-56, Item a. Water quality parameters and beneficial uses which will be affected by this order and the extent of the impact.

The discussion of water quality impacts in the permit does not accurately reflect the findings of the Discharger submitted Antidegradation Analysis Report (AAR) which assessed the effects of an increased discharge from 3.0 to 4.0 mgd.

The findings, under Item 4.a. on page F-55 of the Fact Sheet, appear to reflect findings from both the reasonable potential analysis (RPA) and from the Discharger submitted AAR. Only the findings from the AAR are based on the scientific rationale described in section 4.b. on page F-56 of the Fact sheet. If the Regional Board has made differing antidegradation analysis findings, then those findings, including an explanation of the scientific rationale used, it should be noted in the Fact Sheet in order to highlight and explain differences from the Discharger submitted AAR. Alternatively, the AAR findings for this Order should be modified to accurately reflect the Discharger submitted AAR as follows:

4. Satisfaction of Antidegradation Policy

This Order provides for an increase in the volume and mass of pollutants discharged and is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16 as updated by State Water Board Administrative Procedure Update (APU) No. 90-004. The following is a summary of the Antidegradation Analysis Report (AAR) submitted by the Discharger to evaluate the proposed increase in discharge from 3.0 to 4.0 mgd:

…

The tier designation is assigned on a pollutant-by-pollutant basis. The following is the effect on water quality parameters regulated in this Order, as assessed in the AAR, for an increased discharge from 3.0 to 4.0 mgd:

RW Pollutants	**Current Discharge of 3.0 mgd**		**Increased Discharge of 4.0 mgd**
	Existing Condition	**Finding**	**Effect of this Order**
Aldrin	WQS exceeded upstream	Tier 1	No effect-already Tier 1
Aluminum	RW exceeds WQS, 303(d)	Tier 1	No effect-already Tier 1
Copper	WQS exceeded upstream	Tier 1	No effect-already Tier 1
Iron	WQS exceeded upstream	Tier 1	No effect-already Tier 1
Manganese	RW exceeds WQS, 303(d)	Tier 1	No effect-already Tier 1
Effluent Pollutants	**Current Discharge of 3.0 mgd**		**Increased Discharge of 4.0 mgd**
	Existing Condition	**Finding**	**Effect of this Order**
Ammonia	Assimilative capacity	Tier 2	Less than significant – remains Tier 2
Bis(2-chloroethyl) ether	No assimilative capacity	Tier 1	Implementation of effluent limits – remains Tier 1
Bis(2-ethylhexyl) phthalate	Assimilative capacity	Tier 2	Significance threshold exceeded – remains Tier 2
Carbon Tetrachloride	Assimilative capacity	Tier 2	Significance threshold exceeded – remains Tier 2
Cyanide	Assimilative capacity	Tier 2	Less than significant – remains Tier 2
Dibromochloromethane	No assimilative capacity	Tier 1	Conversion to UV provides for assimilative capacity – change to Tier 2
Dichlorobromomethane	No assimilative capacity	Tier 1	Conversion to UV provides for assimilative capacity – change to Tier 2
Dissolved Oxygen	Assimilative capacity	Tier 2	Further study needed – expected to remain Tier 2
Electrical Conductivity	Assimilative capacity	Tier 2	Conversion to UV will reduce effluent

(a measure of TDS)			EC – remains Tier 2
Mercury	No assimilative capacity	Tier 1	Implementation of effluent limits and insignificant mass increase – remains Tier 1
Persistent Chlorinated Hydrocarbon Pesticides	No assimilative capacity	Tier 1	Implementation of effluent limits – remains Tier 1
pH	Assimilative capacity	Tier 2	Negligible effect – remains Tier 2
Temperature	Assimilative capacity	Tier 2	Further study needed – Expected to remain Tier 2
Total Trihalomethanes (TTHM)	No assimilative capacity	Tier 1	Conversion to UV provides for assimilative capacity – Change to Tier 2
Turbidity	Assimilative capacity	Tier 2	Negligible effect – remains Tier 2
Zinc	No assimilative capacity	Tier 1	Implementation of effluent limits – remains Tier 1

~~**Tier 1 Pollutants** **Affect of this Order**~~
~~Aldrin ....No affect-already Tier 1~~
~~Aluminum.....No affect-already Tier 1~~
~~Copper.....No affect-already Tier 1~~
~~Iron .....No affect-already Tier 1~~
~~Manganese.....No affect-already Tier 1~~
~~Ammonia .....No affect-already Tier 1~~

~~**Tier 2 Pollutants** **Affect of this Order**~~
~~Bis(2-chloroethyl) ether .....Changes designation to Tier 1~~
~~Bis(2-ethylhexyl)phthalate .....Changes designation to Tier 1~~
~~Carbon Tetrachloride.....Changes designation to Tier 1~~
~~Cyanide .....Changes designation to Tier 1~~
~~Dibromochloromethane .....Changes designation to Tier 1~~
~~Dichlorobromomethane .....Changes designation to Tier 1~~
~~Dissolved Oxygen (DO).....Further assessment required~~
~~Electrical Conductivity (a measure of TDS) .Changes designation to Tier 1~~
~~Mercury .....Remains Tier 2 designation~~
~~Persistent Chlorinated Hydrocarbon Pesticides .....Changes designation to Tier 1~~
~~pH.....Remains Tier 2 designation~~
~~Temperature.....Further assessment required~~
~~Total Trihalomethanes (TTHM).....Changes designation to Tier 1~~
~~Turbidity.....Remains Tier 2 designation~~
~~Zinc.....Changes designation to Tier 1~~

(40) Page F-56, Item b. Scientific Rationale for Determining Potential Lowering of Water Quality.

The first sentence should include the August 2005 USEPA memorandum *Regarding Tier 2 Antidegradation Reviews and Significance Thresholds*[1] which is the basis for the 10% significance threshold. The second sentence should be corrected to fix a typographical error. To explain that

[1] U.S.EPA 2005. King, Ephraim S. Director. Office of Science and Technology, Washington, DC. August 10– Memorandum to Water Management Division Directors, Regions 1-10, *Regarding Tier 2 Antidegradation Reviews and Significance Thresholds*.

assimilative capacity is linked to water quality standards and the associated beneficial uses and to describe when assimilative capacity was calculated on a concentration versus a mass loading basis, the Discharger suggests the addition of two new sentences after the second sentence. The third sentence does not accurately relate the outcome of exceeding the 10% significance threshold according to the August 2005 USEPA memo on "Tier 2 Antidegradation Reviews and Significance Thresholds." The USEPA memo calls for a full tier 2 review as restated below:

> "A ten (10) percent value is in within the range of values for significance thresholds the EPA has approved in other States as well. EPA considers this approach workable and protective in identifying those significant lowerings of water quality that should receive a full tier 2 antidegradation review, including public participation." (USEPA 2005)

It is State guidance, not federal, that requires the consideration of alternatives (APU 90-004, page 5, d.). The fourth sentence should clarify that the AAR pertains to the increased discharge of 4.0 mgd. To incorporate the above corrections and additions, the text should be modified as follows:

b. **Scientific Rationale for Determining Potential Lowering of Water Quality.**
The rationale used in the AAR is based on Code of Federal Regulation, Section 131.12 (40 CFR 131.12), USEPA memorandum *Regarding Tier 2 Antidegradation Reviews and Significance Thresholds* (USEPA 2005), USEPA Region 9 *Guidance on Implementing the Antidegradation Provisions of 40 CFR 131.12* (USEPA 1987), State Water Resources Control Board (SWRCB) Resolution No. 68-16, a SWRCB 1987 policy memorandum to the Regional Water Quality Control Boards (RWQCB), and an Administrative Procedures Update (APU 90-004) issued by SWRCB to the RWQCBs. The scientific rationale the Discharger used to determine if the Order allows a lowering ~~lowing~~ of water quality is to determine the reduction of assimilative capacity. Assimilative capacity was calculated on a mass-balanced, concentration basis, and, for bioaccumulative constituents, calculated on a mass loading basis. This approach is consistent with recent USEPA guidance and addresses a key objective of the AAR to "[c]ompare receiving water quality to the water quality objectives established to protect designated beneficial uses" (APU 90-004). ~~of the receiving water above a recommended USEPA threshold.~~ USEPA has recommended ten (10) percent as a measure of significance for identifying those substantial lowerings of water quality that should receive a full tier 2 antidegradation review ~~determining whether alternatives to the proposed action must be considered~~. APU 90-004 requires the consideration of "feasible alternative control measures" as part of the procedures for a complete antidegradation analysis. The Discharger analyzed each pollutant detected in the effluent and receiving water to determine if the increased discharge of 4.0 mgd authorized by this ~~the~~ Order potentially allows significant increase of the amount of pollutants present in the downstream receiving water. Pollutants that significantly increased concentration or mass downstream required an alternatives analysis to determine whether implementation of alternatives to the proposed action would be in the best socioeconomic interest of the people of the region, and be to the maximum benefit of the people of the State. Details on the scientific rationale are discussed in detail in the AAR.

(41) Page F-56/57. Correction is needed in the fact sheet to explain that the cost of the alternatives is in ***addition to*** the cost of the proposed project for all alternatives except connection to the Sacramento Regional Wastewater Treatment Plant.

> "Where necessary, Carollo Engineers (Carollo) provided initial cost estimates for construction of additional plant facilities (**Appendix E**)." (AAR, page 30 with underline emphasis added)

The engineering cost estimate for connection to Sacramento Regional Wastewater Treatment Plant is unique because this option, as described in Appendix E of the AAR, assumes that no treatment would be need to connect to Sacramento Regional Wastewater Treatment plant. The validity of this assumption is primarily dependent on Sacramento Regional Wastewater Teatment Plant's unknown requirements for such a proposed project. Some treatment, i.e secondary treatment, may still be required. To provide correction of the cost estimates, the text should be modified as follows:

> "The plant expansion alternatives and associated estimated costs to implement the alternatives are summarized below:
>
> 1. No Alternative, proposed project ($35.6 million)
> 2. Higher level of treatment using micro filtration (additional $44.4 million);
> 3. Zero discharge (100%) recycling of additional plant capacity (additional $37.2 million plus land acquisition costs);
> 4. Flow restricted discharge (not feasible due to insufficient dilution flow);
> 5. Pollutant source minimization (additional $87.7 million);
> 6. Connect to Sacramento Regional Wastewater Treatment Plant ($125 million); and
> 7. Change in drinking water source (not feasible due to already existing high quality of source water)."

(42) Page F-58, Item IV. D.4.e. Justification for Socioeconomic Considerations. As discussed in the AAR in sections 6.4 "Benefits of Increased Discharge," Section 6.5 "Environmental Considerations", and 6.6 "Socioeconomic Considerations," the proposed increase in discharge is necessary to accommodate important housing and economic expansion in the area. The final paragraph should be modified as follows:

> "The increase in the volume and mass of pollutants discharged will not cause a violation of water quality objectives. The increase in the discharge allows wastewater utility service necessary to accommodate important housing and economic expansion in the area, and is considered to be of maximum public ~~a~~ benefit to the people of the State. Compliance with these requirements will result in the use of best practical treatment or control of the discharge."

(43) Page F-59, Table F-17. The limitations for manganese should be deleted from this table. As described on p. F-30/31, the limitation for manganese is an annual average limitation, not a monthly limitation. In addition, based on the recent letter from Mr. Carl Lischeske of DHS to Mr. Landau of the Regional Board, dated April 10, 2007, dissolved manganese should be monitored, not total recoverable.

ATTACHMENT 1

LETTER FROM U.S. EPA HEADQUARTERS REGARDING THE PROPER PERMITTING OF ALUMINUM

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
WATER

December 19, 2003

Richard McHenry
Central Valley Regional Water Quality Control Board
McHenrR@rb5s.swrcb.ca.gov

Michael Bryan
Robertson-Bryan, Inc.
bryan@robertson-bryan.com

Dear Mr. McHenry and Mr. Bryan:

This is in follow-up to my letter of November 1, 2002. Both of you have requested clarification of the issues discussed therein.

As has been previously pointed out, EPA's 1988 chronic aluminum criterion, 87 µg/L, is based on two tests, one with brook trout and one with striped bass, at low hardness (10 - 12 mg/L) and low pH (6.5 - 6.6 SU). This value is considered to be necessary for protecting waters having such low hardness and pH. However, this value is expected to be overly protective when applied to waters of moderate hardness and pH. Many such waters are known to exceed this value while fully attaining the goals of the Clean Water Act.

Based on data for a diversity of species tested at hardness in the range of 45 - 220 mg/L and pH in the range of 6.5 - 8.3, the 1988 document notes that the chronic criterion would be determined to be 750 µg/L. Consequently, with EPA approval, some states apply this 750 µg/L value to waters of moderate (or higher) hardness and pH.

EPA has recently worked with the State of Utah to develop the following provision in their standards:

> The aluminum criteria are expressed as total recoverable metal in the water column. The 87 µg/L chronic criterion for aluminum is based on information showing chronic effects on brook trout and striped bass. The studies underlying the 87 µg/L chronic value, however, were conducted at low pH (6.5 - 6.6) and low hardness (< 10 ppm CaCO3), conditions uncommon in Utah's surface waters. A water effect ratio toxicity study in West Virginia indicated that aluminum is substantially less toxic at higher pH and hardness (although the relationship is not well quantified at this time). Further, EPA is aware of field data indicating that many high quality waters in the U.S. contain more than 87 µg/L aluminum when either the total recoverable or dissolved aluminum is measured. Based on this

> information and considering the available toxicological information in Tables 1 and 2 of EPA's Aluminum Criteria Document (EPA 440/5-86-008), the Department of Environmental Quality will implement the 87 µg/L chronic criterion for aluminum as follows: where the pH is equal to or greater than 7.0 and the hardness is equal to or greater than 50 ppm as CaCO3 in the receiving water after mixing, the 87 µg/L chronic criterion will not apply, and aluminum will be regulated based on compliance with the 750 µg/L acute aluminum criterion. In situations where the 87 µg/L chronic criterion applies, a discharger may request development of a site-specific chronic criterion based on a water effect ratio. Or, a discharger may request development of a permitting procedure (a translator) that would take into account less toxic forms of particulate aluminum. In either case, the Department may require that the discharger requesting the change provide the technical information and data needed to support such a change.

I believe that such an approach may be helpful in resolving the water quality issues you are dealing with. Depending on hardness and pH, either the criterion 750 µg/L is applied, or a criterion of 87 µg/L with or without a Water-Effect Ratio (WER) modification is applied.

Experience indicates that WER studies are appropriate for aluminum, using *Ceriodaphnia* as the test species. Under conditions of low pH and temperature, *Ceriodaphnia* is as sensitive as brook trout or striped bass.

Although EPA endorses the Utah approach, we recognize that such an approach does not resolve all aluminum issues. In particular, in some streams, nontoxic clay particles (aluminum silicate), measured by the total recoverable procedure, are high enough to exceed the 750 µg/L criterion. Although measured by the total recoverable procedure, the criterion is not intended to apply to aluminum silicate particles, as noted in the 1988 document.

The EPA criteria program recognizes that a more thoroughgoing solution is needed for resolving the problems with the 1988 criterion. Nevertheless, resources have not been allocated to such an undertaking. There are two reasons for this. First, aluminum is not a priority pollutant. Most states do not have an aluminum criterion. Nor has EPA ever promulgated a criterion for aluminum in any rule. Second, aluminum chemistry is extremely complex. Attempting development of a biotic ligand model for aluminum would require more resources than for copper or silver, already daunting jobs in themselves.

From phone conversations with both of you it is apparent that there is question about the actual hardness and pH of the river to which the criterion is being applied. I cannot become further involved with such data for the site. But I will set forth the appropriate procedure for setting the hardness and pH applicable to the criterion.

The key point is that the applicable hardness and pH are those that occur in the waters downstream of the effluent. The protectiveness and appropriateness of the criterion cannot be guaranteed unless the downstream water quality parameters are used.

If using data on upstream and effluent hardness, then use the dilution formula to determine the downstream hardness concentration C_D:

$$C_D = \frac{C_E Q_E + C_U Q_U}{Q_E + Q_U}$$

where C_E and C_U are the effluent and upstream concentrations, and Q_E and Q_U the effluent and upstream flows.

Determination of downstream pH from upstream and effluent pH is more convoluted and requires data on alkalinity. EPA's 1988 document Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling sets forth the procedure, which is based on carbonate equilibrium. The subscripts U and E refer to the upstream and effluent:

1. Calculate the carbonate equilibrium constants, pK:

$$pK_U = 6.57 - 0.018\,T_U + 0.00012\,T_U^2$$
$$pK_E = 6.57 - 0.018\,T_E + 0.00012\,T_E^2$$

where T is temperature.

2. Calculate the corresponding ionization fractions, F:

$$F_U = \frac{1}{1 + 10^{pK_U - pH_U}} \qquad F_E = \frac{1}{1 + 10^{pK_E - pH_E}}$$

3. Calculate the total inorganic carbon concentrations, TIC:

$$TIC_U = \frac{Alk_U}{F_U} \qquad TIC_E = \frac{Alk_E}{F_E}$$

where Alk is alkalinity.

4. Calculate the downstream T_D, Alk_D, and TIC_D, using the standard dilution formula shown for hardness at the top of the page.

5. Calculate the downstream ionization constant.

$$pK_D = 6.57 - 0.018\,T_D + 0.00012\,T_D^2$$

6. Finally, calculate the downstream pH:

$$pH_D = pK_D - \log_{10}\left(\frac{TIC_D}{Alk_D} - 1\right)$$

State implementation procedures vary considerably with respect to the frequency corresponding to a design parameter such as hardness or pH. For the National Toxics Rule, EPA only indicated that the design hardness selected by the state should be consistent with what occurs during the low flow design event.

I hope this is helpful for resolving your issues.

Sincerely,

Charles Delos
Environmental Scientist

ATTACHMENT 2

U.S. EPA'S RECOMMENDED AMBIENT WATER QUALITY CRITERIA FOR ALUMINUM – 1988

United States
Environmental Protection
Agency

Office of Water
Regulations and Standards
Criteria and Standards Division
Washington, DC 20460

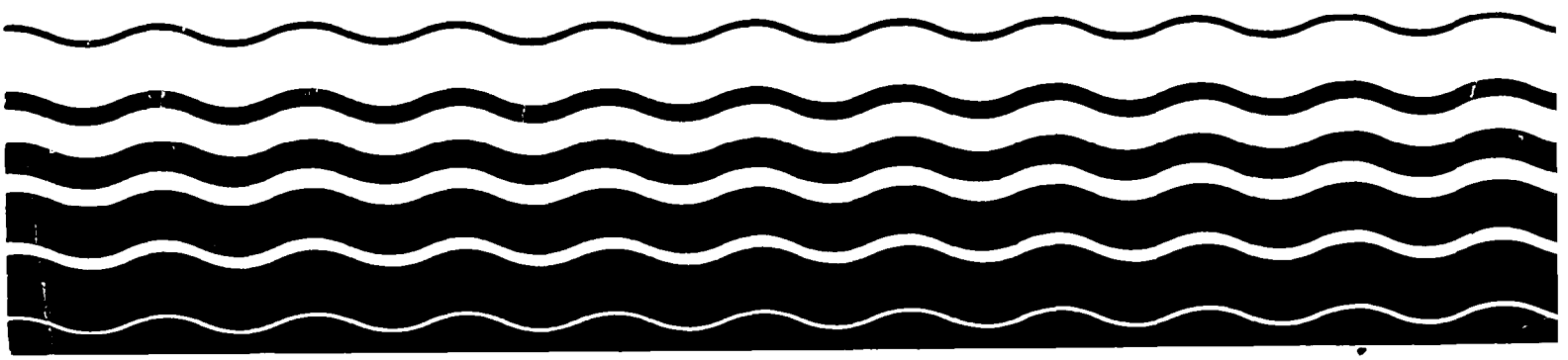
EPA 440/5-86-008
August 1988

Water

EPA

Ambient Water Quality Criteria for

Aluminum - 1988



AMBIENT AQUATIC LIFE WATER QUALITY CRITERIA FOR

ALUMINUM

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RESEARCH AND DEVELOPMENT
ENVIRONMENTAL RESEARCH LABORATORY
DULUTH, MINNESOTA

CONTENTS

TABLES

The three available acute-chronic ratios for aluminum are 0.9958 with Ceriodaphnia dubia, 51.27 with Daphnia magna, and 10.64 with the fathead minnow (Table 2). These values follow the common pattern that acutely sensitive species have lower acute-chronic ratios (Table 3). The Final Acute-Chronic Ratio is meant to apply to acutely sensitive species, and, therefore, should be close to 0.9958. However, according to the Guidelines, the Final Acute-Chronic Ratio cannot be less than 2, because a ratio lower than 2 would result in the Final Chronic Value exceeding the Criterion Maximum Concentration. Thus the Final Chronic Value for aluminum is equal to the Criterion Maximum Concentration of 748.0 µg/L for fresh water at a pH between 6.5 and 9.0 (Table 3).

Data in Table 6 concerning the toxicity of aluminum to brook trout and striped bass show that the Final Chronic Value should be lowered to 87 µg/L to protect these two important species. Cleveland et al. (Manuscript) found that 169 µg/L caused a 24% reduction in the weight of young brook trout in a 60-day test, whereas 88 µg/L caused a 4% reduction in weight. In a 7-day test, 174.4 µg/L killed 58% of the exposed striped bass, whereas 87.2 µg/L did not kill any of the exposed organisms (Buckler et al., Manuscript). Both of these tests were conducted at a pH of 6.5 to 6.6.

Toxicity to Aquatic Plants

Single-celled plants were more sensitive to aluminum than the other plants tested (Table 4). Growth of the diatom, Cyclotella meneghiniana, was inhibited at 810 µg/L, and the species died at 6,480 µg/L (Rao and Subramanian 1982). The green alga, Selenastrum capricornutum, was about as sensitive to aluminum as the diatom. Effects were found at concentrations

ATTACHMENT 3

APRIL 10, 2007 DHS LETTER TO REGIONAL WATER BOARD PERTAINING TO COMPLIANCE MONITORING USING TOTAL RECOVERABLE VS. DISSOLVED MEASUREMENTS FOR IRON, MANGANESE, AND ALUMINUM

KDL

State of California—Health and Human Services Agency
Department of Health Services

California
Department of
Health Services

SANDRA SHEWRY
Director

ARNOLD SCHWARZENEGGER
Governor

April 10, 2007

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Kenneth D. Landau, Assistant Executive Officer
Central Region
California Regional Water Quality Control Board
11020 Sun Center Drive, No. 200
Rancho Cordova, CA 95670-6114

Dear Mr. Landau:

YUBA CITY WASTEWATER TREATMENT PLANT

This is in response to your letter of March 30, 2007 in which you requested consultation on implementing the secondary maximum contaminant levels for the Yuba City wastewater treatment plant NPDES permit. At issue is whether compliance should be based upon the total recoverable, or dissolved fraction of iron, manganese, and aluminum.

We believe that compliance based on the dissolved fraction of these contaminants is sufficient to protect municipal and drinking water uses. State law requires filtration of all surface water supplies derived from the Feather and Sacramento Rivers at points downstream of the Yuba City wastewater treatment plant outfall. The filtration processes used for this purpose are adequate to remove particulates that contain these contaminants.

Thank you for the opportunity to comment on this matter. Please contact me at (916) 449-5626 if you have any questions.

Sincerely,

Carl Lischeske

Carl Lischeske, P.E., Chief
Northern California Region
Division of Drinking Water and Environmental Management