AMENDMENTS

TO THE

WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS

To

Establish Site-Specific Water Quality Objectives for Chloroform, Chlorodibromomethane, and Dichlorobromomethane for New Alamo and Ulatis Creeks and Permit Implementation Provisions

Responses to Peer Review Comments
on
November 2009 Draft Staff Report
and Supporting Documents

April 2010

This document contains Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff's responses to peer review comments on: *Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins to Establish Site-Specific Water Quality Objectives for Chloroform, Chlorodibromomethane, and Dichlorobromomethane for New Alamo and Ulatis Creeks and Permit Implementation Provisions*, as presented in staff's Draft Staff Report (Staff Report). Peer review of the proposed Basin Plan amendments was provided by Dr. Steve E. Hrudey and Dr. Michael J. Daniels. Dr. Hrudey is a Professor Emeritus from the Faculty of Medicine and Dentistry's Division of Analytical and Environmental Toxicology at the University of Alberta. Dr. Daniels is a Professor of Statistics at the University of Florida.

The specific scientific issues identified for peer review were to determine whether:

1. the proposed site-specific objectives provide adequate protection of human health,
2. the approach to determining "reasonable potential" would be appropriate and reasonable,
3. the "attenuation factor" as proposed, is a technically sound approach to derive NPDES permit effluent limitations, if needed, and
4. there are any other "big picture" issues regarding the scientific issues that warrant peer review comment.

Both peer reviewers support the proposed amendments. Nevertheless, each reviewer made comments that posed questions to staff or made suggestions to improve clarity of the information presented in the staff report. Therefore, for completeness, and to make best use of the peer review process, each of the separate comments provided by each reviewer in response to the numbered scientific issues identified above has been bracketed and numbered for the purposes of providing specific staff responses to each individual comment provided by the reviewers. Dr. Hrudey's and Dr. Daniels' written comments, with individual comments identified by margin bracketing and numbering, are attached as Attachment 1 and Attachment 2, respectively. The Central Valley Water Board staff responses to peer reviewer comments provided below are organized consistent with the attached comments and numbering scheme assigned to each reviewer's comments.

I. STAFF RESPONSES TO COMMENTS PROVIDED BY DR. HRUDEY

ISSUE #1. *THE PROPOSED SITE-SPECIFIC OBJECTIVES PROVIDE ADEQUATE PROTECTION OF HUMAN HEALTH.*

Summary of *Comment #1 footnote*: *"The terminology used in this documentation, although commonly in use, differs from some common drinking*

water literature, regulatory documents and the USEPA IRIS database. These reference sources refer to these two contaminants as dibromochloromethane (DBCM) and bromodichloromethane (BDCM). To minimize confusion, I will use the terminology as it has been used in the documentation provided."

Response to comment: The terminology for chlorodibromomethane (i.e., dibromochloromethane or DBCM), and dichlorobromomethane (DCBM) is consistent with the terminology used by the USEPA in the establishment of water quality criteria for priority toxic pollutants for the State of California [40 CFR Part 131.38] (i.e., the California Toxics Rule) which is what defines the current objectives for these constituents in the reaches of New Alamo and Ulatis creeks addressed in the Draft Staff Report. It is expected that the CTR will be modified as part of the approval process for the proposed Basin Plan amendments. Consistency in nomenclature was used for this reason.

Summary of Comment #1: *"These disinfection by-products are regulated as a group by a maximum contaminant level (MCL) for total trihalomethanes (TTHM) of 80 µg/L under the Safe Drinking Water Act. It is ironic to be judging the scientific validity of the rationale for setting site-specific water quality objectives to assure adequate protection of human health by classifying the specified water courses for a "MUN" beneficial use (municipal and domestic water supply) when the current Safe Drinking Water Act MCL for TTHM is not "incorporated by reference in the Basin Plans as a water quality objective for chemical constituents. Thus, the 80 µg/L MCL is not directly applicable as a water quality objective for surface waters."*

Response to comment: Even if the MCL of 80 µg/L for TTHMs were applicable through the Basin Plan, so too are the CTR criteria for DCBM and DBCM. Whenever criteria from the CTR and objectives from the Basin Plan exist for a constituent, the State uses the most stringent of the two for purposes of NPDES permitting. So, even if the MCL could be applied, the CTR would take precedence. As such, the site specific objectives are needed for this site.

Summary of *Comment #1(a)*: *The peer reviewer provides a history of the total trihalomethanes.*

Response to comment: Staff thanks the peer reviewer for the information. No response required.

Summary of Comment #1(b): *The peer reviewer provides history and current information on the regulatory status of chloroform and comments on the use of the linear, no threshold cancer slope factor for estimating cancer risk (contained in the 2009 USEPA National Recommended Water Quality Criteria) rather than the non-linear, threshold model (used in developing the current USEPA maximum contaminant level goal or MCLG). The peer reviewer also noted that the chloroform criteria presented in the staff report "was reported as being taken*

from the 2006 USEPA National Recommended Water Quality Criteria, but I could find no such 2006 document on the USEPA website. The most recent report before the current 2009 version of this document (USEPA 2009) was issued in 2002. This is a minor point because the 2009 report provides the same value, 5.7 µg/L, for chloroform (USEPA 2009)." The peer reviewer concluded that use of the linear, no threshold cancer slope factor estimated no human health cancer risk.

Response to comment: Central Valley Water Board staff made the decision early in the process, with input and concurrence from State Water Board and USEPA Region IX staff, that the proposed amendments would rely on USEPA's current human health methodology and recommended criteria (e.g., 5.7 µg/l) for chloroform, since criteria were reserved for chloroform in the CTR. Discussion was held regarding use of the latest science on chloroform and the resulting MCLG of 70 µg/l. However, in the end, the agencies decided that because this science has not undergone the full public standards setting process and because use of USEPA's current human health methodology and criteria for chloroform (which has undergone the full public standards setting process) would be conservative, relative to the new MCLG of 70 µg/l, Central Valley Water Board staff would conservatively hold to the current human health methodology and criteria for development of the alternative site-specific objectives, and their relative risk characterization.

Central Valley Water Board staff-recommended alternative, Alternative 4B, is based on the current condition in the water bodies, in part to best address antidegradation considerations. The current condition was compared to the current National Recommended Water Quality Criteria for chloroform, derived at several risk levels (e.g., 10^{-6}, 10^{-5}, and 10^{-4}) to confirm that the current condition is adequately protective of current and reasonably expected potential future beneficial uses of segment waters. In the case of the proposed site-specific objective for chloroform (i.e., 45.5 µg/l), which was based on the upper end of the current segment concentration distribution, it was found to be protective of beneficial uses and, as the reviewer indicates, is very conservative relative to the newly updated MCLG.

As for the 2006 USEPA National Recommended Water Quality Criteria, the USEPA periodically revises its compilation of the National Recommended Water Quality Criteria and provided a revised compilation in December 2009. The Draft Staff Report will be revised to reference the most recent compilation even though the recommended water quality criteria for DBCM, DCBM and chloroform remain the same as the compilation from 2006. The administrative record for the Basin Plan amendment will include a copy of the December 2009 compilation.

Summary of Comment #1(c): *The peer reviewer provides limited history and regulatory status of DCBM then provides comments that the "the regulatory model used for calculating cancer risks based on a linear, low dose extrapolation*

provides an upper bound estimate of cancer risk, not an expected cancer risk. This was most clearly explained in the 1986 Cancer Risk Assessment Guidelines (USEPA 1986) which remain posted on the USEPA website and state: "It should be emphasized that the linearized multistage procedure leads to a plausible upper limit to the risk that is consistent with some proposed mechanisms of carcinogenesis. Such an estimate, however does not necessarily give a realistic prediction of the risk. The true value of the risk is unknown, and may be as low as zero. The range of risks, defined by the upper limit given by the chosen model and the lower limit which may be as low as zero, should be explicitly stated." When it comes to judging, from a scientific perspective, whether there is a substantial risk to human health from the water quality objectives proposed, the range of estimated risks must be considered to provide that perspective." The peer reviewer concludes that "there is a negligible scientific basis to justify any credible human health concerns with the recommended site-specific water quality objective for DCBM of 15.5 µg/L."

Response to comment: Staff appreciates the peer reviewer providing DCBM information. Staff agrees that the incremental cancer risk is an upper bound rather than an actual expected cancer risk. The staff report will be modified to clarify that actual risk estimates are unknown, but vary from 0 to the estimated maximum risk level currently shown in the Draft Staff Report.

Summary of *Comment #1(d)*: *The peer reviewer provides limited history and regulatory status on DBCM then concludes that "there is a negligible scientific basis to justify any credible human health concerns with the recommended site-specific water quality objective for DBCM of 4.5 µg/L."*

Response to comment: Comment noted. No response required.

ISSUE #2. *DETERMINATION OF 'REASONABLE POTENTIAL'.*

Summary of Comment #2: ***"****The fact that a short term excursion of any of the parameters above the site-specific THM objectives at any location in the defined segments would have no health-related consequences to any transient or incidental drinking water user provides a substantial buffer for any unforeseen failures in the implementation of this amendment."*

"I find that the determination of "reasonable potential" to cause or contribute to an excursion above the site-specific THM objectives within the defined segments of the watershed for recommended option 4b poses no scientific problems with its derivation."

Response to comment: Comment noted. No response required.

ISSUE #3. *THE PROPOSED 'ATTENUATION FACTOR'.*

Summary of *Comment #3*: *"I find that the proposed determination of the "attenuation factor" for recommended option 4b to determine the appropriate values to define a maximum effluent concentration poses no scientific problems with its derivation."*

Response to comment: Comment noted. No response required.

ISSUE #4. *OTHER 'BIG PICTURE' SCIENTIFIC ISSUES WARRANTING COMMENT.*

Summary of *Comment #4(a)*: *"The cancer risk predictions which underlie all of these site-specific water quality recommendations are based on using cancer slope factors with all of their attendant uncertainty. The guidance which was given on presenting numerical cancer risk estimates was (USEPA 1986): "Irrespective of the options chosen, the degree of precision and accuracy in the numerical risk estimates currently do not permit more than one significant figure to be presented." Other limitations such as sampling and analytical accuracy will often limit estimates to no more than two significant figures…If more significant figures are used than are warranted, the message conveyed is that the values are known with greater precision and possibly accuracy than they really are known."*

Response to comment: The comment is actually regarding two issues. The USEPA guidance is related to the cancer risk level. The Staff Report includes cancer risk levels calculated from Alternatives 4A and 4B which represent the current water quality in the water body segments. The cancer risk levels are presented to three significant figures in order to provide differentiation between the different alternatives. Since the cancer risk level is not the basis of the staff recommendation for these alternatives and the cancer risk levels are presented as work in progress, the three significant figures are maintained in the Staff Report.

The second issue covered in the comment is more generic to the water quality criteria and notes that analytical data is generally available with no more than two significant figures. Staff agrees with this comment. Analytical laboratories generally have reporting limits of 1.0 µg/l and method detection limits of 0.5 µg/l or less for DCBM, DBCM, and chloroform (e.g., using EPA Method 624), and report analytical results to 2 significant figures. The historical data used to develop the proposed Alternative 4B objectives included segment THM concentration data reported to two and three significant figures. The current CTR objectives for DCBM and DBCM and USEPA recommended criterion of chloroform are expressed to two significant figures.

Staff ~~concur with the reviewer's comment and~~ will round the Alternative 4A chloroform objective and the proposed 4B objectives for DBCM and DCBM to two significant figures. This results in the proposed 4B objectives being 4.9 µg/l, 16 µg/l, and 46 µg/l for DBCM, DCBM, and chloroform, respectively. Such rounding does not change the relative level of protection provided by the proposed objectives, which would remain very conservative and fully protective of the MUN use. All proposed water quality objectives under all alternatives will be changed to two significant figures in response to the peer reviewer's input on this matter.

Summary of *Comment #4(b)*: *"Although the authors of the recommendations that were submitted for peer review are captive to the regulatory system which authorizes their actions, the enormous delays that are evident in translating the best available scientific evidence into practice should be a concern for all who must work with the criteria. In the case of chloroform, there has clearly been a seriously inconsistent adoption of the best available evidence across the various elements of the USEPA which left the authors of the current work obliged to use evidence which is clearly outdated and scientifically inaccurate on the face of it."*

Response to comment: Staff agrees that the Central Valley Water Board is constrained to use of the current USEPA National Recommended Water Quality Criteria. Also, see response to comment #1(b).

Summary of *Comment #4(c)*: *"From personal experience with my own research lab, I can caution that there is a potential difficulty with assuring accurate quantitative results for routine (gas chromatographic) monitoring of brominated THMs (in this case DCBM and DBCM) at levels approaching the detection limits, which is a range in which the recommended site specific water quality criteria will require monitoring results to be meaningful. In particular, the implementation of this program should allow a sensible and pragmatic approach calling for immediate re-testing if any exceedance values of either compound are apparently detected."*

Response to comment: The comment suggest that the implementation program for the site-specific objectives should allow for immediate re-testing if any exceedance of the objectives is apparently detected. Regarding the implementation program, and its use of monitoring data, the Central Valley Water Board staff has chosen to use applicable SIP procedures for assessing reasonable potential for a discharge to the segments to cause an excursion above the applicable site-specific objectives. The SIP procedures do not allow for immediate re-testing if monitoring indicates that an objective has been exceeded. Rather, the SIP procedure requires comparing the highest measured THM value to the applicable criteria for purposes of assessing reasonable potential. The State Water Board determined that 0.5 µg/l is an appropriate minimum level for reporting and compliance purposes under the SIP for these constituents based on data provided by State certified analytical laboratories in 1997 and 1998 (see

Appendix 4 of SIP). In addition, this has also been demonstrated by the historic monitoring that the City of Vacaville has performed for these three constituents.

Summary of *Comment #4(d)*: *"The physical and chemical properties of the THMs are such that they represent transient, not persistent, nor substantially bioaccumulative pollutants. Likewise, any aquatic ecological concerns associated with these contaminants would have given rise to much higher (less restrictive) water quality objectives. Given these scientific realities, it would have been worthwhile to consider whether the protection of future MUN water use required imposition of stringent water quality controls at present to protect uses which may never occur rather than imposing such controls in the future if a need arose to protect actual MUN beneficial water uses."*

Response to comment: The beneficial use that is most sensitive to the pollutants of concern is the Municipal and Domestic Supply Beneficial Use (MUN). While Central Valley Water Board staff knows that there is no municipal use and there does not appear to be a permanent domestic use that is occurring, staff also decided to protect any transient and temporary use, as well as potential future uses. By its nature, it is impossible to rule out the occurrence of transient and temporary use. The proposed water quality objectives are designed to protect any transient or temporary use that might occur and potential future uses. The approach the reviewer mentions is possible by de-designating the MUN use today, based on available information, and designating it again in the future if the use is ever attained in the future, and then establishing objectives protective of that use at the time the beneficial use is designated. This approach was considered by staff, with input by State Water Board and USEPA Region IX staff, but was rejected in favor of the approach identified and discussed in the Draft Staff Report.

In addition, when adopting water quality objectives, the Central Valley Water Board must take into consideration the water quality standards of downstream waters [40 CFR 131.10(b)]. All the alternatives for water quality objectives provide for attainment of the water quality standards (i.e., CTR criteria for DCBM and DBCM and USEPA recommended criteria of 5.7 µg/l for chloroform) at Cache Slough, which had diversions for municipal supply as recently as 1992 [p. 2 and p. 17 (section 3.4.3) of Draft Staff Report].

Summary of *Comment #4(e)*: *"The City of Vacaville may want to consider performing an economic analysis of the long term monitoring costs under the recommended program, the current status of its disinfection facilities (including dechlorination if that is practiced) and the economic viability of implementing UV disinfection for its wastewater effluent to avoid TTHM formation altogether. Ongoing monitoring costs can become substantial and UV disinfection is becoming more cost effective".*

Response to comment: While the issues of the City of Vacaville's Easterly Wastewater Treatment Plant make the resolution of the water quality standards in the receiving waters necessary and urgent, it is not the sole reason for proceeding with the proposed Basin Plan amendments. Both federal and state laws and regulations require the Central Valley Water Board to adopt appropriate water quality standards. It is apparent that the applicable water quality standards for the receiving waters were overly stringent and should be modified.

The City of Vacaville did perform an analysis of the economic viability of implementing UV disinfection for its wastewater effluent to avoid TTHM formation altogether. The capital cost associated with required facility modifications are discussed in Section 3.4.4 (Economic Consideration) of the Draft Staff Report. Nevertheless, as described on pages 50-51 of RBI 2009, *Derivation of Human Health Criteria for Trihalomethane Compounds for Segments of New Alamo Creek and Ulatis Creek, Solano County, California*, it is uncertain whether the use of ultraviolet (UV) light for effluent disinfection will eliminate THMs in the effluent at all times. If the City were to replace the current chlorine disinfection with UV disinfection and THMs continue to be present at elevated levels in the effluent, even periodically, then the City would still need to conduct a similar level of monitoring for these constituents. If the THMs are not present at elevated levels, then the City will still be required to monitor for THMs, although at a reduced frequency. Therefore, the cost of monitoring was not included in the discussion of economic considerations in the Draft Staff Report.

II. STAFF RESPONSES TO COMMENTS PROVIDED BY DR. DANIELS

ISSUE #1. *THE PROPOSED SITE-SPECIFIC OBJECTIVES PROVIDE ADEQUATE PROTECTION OF HUMAN HEALTH.*

Summary of Comment #1a: *In general, Alternatives 1, 2, and 3 appear to be unnecessarily strict given the current and expected use of lower New Alamo Creek and Ulatis Creek. The lowest of these restrictions is Alternative 3 which gives a risk level of 10^{-5} again under unrealistically large assumptions about consumption.*

"The risk calculations for Alternative 4A result in incremental cancer risks between $10^{-4.95}$ and $10^{-5.38}$ under the assumption of 2 L/day of water and up to 17.5 g/day of fish/shellfish from the segments. For Alternative 4B, the incremental cancer risks are between $10^{-4.55}$ and $10^{-4.91}$ under the same consumption assumption. Thus, as pertains to the magnitude of consumption assumption, the risk calculations are conservative.

"However, I would like to point out some minor issues with the concentration data used for the calculations of risk. In the report, the contributors fit normal and lognormal distributions for measured data for each THM at each location. The

assumption of a lognormal distribution seems appropriate given the data and the desire to have a parametric distribution to estimate the upper percentiles. However, given the lack of data for Brown Alamo Dam relative to End of Old Alamo Creek, should some sort of adjustment be made to account for the 'oversampling' of the smaller values which appears to have occurred? For example, trying to 'impute' the Brown Alamo Dam data from the End of Old Alamo Creek data? In addition, is it better to weight recent data more than past data? This might be of importance if any (increasing) trend is observed from 2002 to 2007. Also, is there a need to 'adjust' the data for seasonality (e.g., monthly effects) since there was imbalance in terms of months measured (at Brown-Alamo Dam) during the period from 4/2003 to 8/2007 (as seen in Table A-4). I wonder how these sort of adjustments might impact the estimates of the highest percentiles in Table B.4 (and then the corresponding cancer risk (CR))? These would be most relevant for Alternatives 2-4A. For Alternative 4B, several of these issues are less relevant given the richer concentration data at the terminus of OAC.

"So in sum, for the risk assessment conducted under Alternatives 4A and 4B (which are the most practical), how much would modified estimates of the concentration (as discussed above), impact the risk levels? These issues should be able to be addressed with minimal difficulty."

Response to Comment: The peer reviewer notes the dearth of data for water quality at Brown Alamo Dam relative to the data at the end of Old Alamo Creek and questions whether there are statistical methods to adjust the data for Brown Alamo Dam to provide more robust calculations.

Imputing the Brown-Alamo Dam data by extrapolating values from Old Alamo Creek would have inherent uncertainties, because of the factors affecting THM concentrations at Brown-Alamo Dam, including volatilization during mixing of Old Alamo Creek and New Alamo Creek waters, volatilization in New Alamo Creek between the terminus of Old Alamo Creek and the Brown-Alamo Dam location, and dilution flows contributed by New Alamo Creek. Thus, only actual data were used for statistical analyses of concentrations at the Brown-Alamo Dam site, thereby preventing the introduction of unknown biases to the data used to derive Alternative 4A objectives. Modifying the data distribution for these constituents at Brown-Alamo Dam in an effort to make a more statistically robust data set from which to derive Alternative 4A objectives runs the risk of deriving Alternative 4A objectives that are not consistent with historical observations and thus could allow for further degradation of water quality within the segments with regard to DCBM, DCBM, and chloroform.

There is no apparent temporal trend (i.e., trend over time) in the data sets. ANOVA was performed on the best-fit linear regressions of end of Old Alamo Creek DBCM, DCBM, and chloroform concentrations vs. days since the start of the data set (Figures 1-3). The statistical test evaluates whether the slope of the

regression line is statistically significantly different from zero (i.e., different than a horizontal line). The regression slopes for DBCM, DCBM, and chloroform were not significantly different from zero slope (p=0.53, p=0.96, and p=0.56, respectively), indicating so significant trend in the data over time. Therefore, there is no reason to weight recent data more than past data.

The influence of seasonality on constituent concentrations at the Brown-Alamo Dam location are not consistent year to year because key factors influencing these concentrations such as in-channel flows to dilute Easterly Wastewater Treatment Plant (WWTP) discharges, WWTP effluent THM concentrations, channel flow velocities, and creek temperatures are not consistent year-to-year, for a given month. As described above, any adjustment to the data to "expand" the Brown-Alamo Dam data set beyond that of the actual measured data was not done due to the uncertain potential biases such action would impart to the data set. Central Valley Water Board staff believes that the use of the actual measured data collected at the Brown-Alamo Dam location provides the most sound data set from which to derive Alternative 4A objectives.

The peer reviewer wonders how adjustments to the data sets might impact the statistical analysis results for Alternatives 2-4A. Staff believes that the peer reviewer mistyped because Alternatives 2 and 3 were not derived from statistical analysis of the Old Alamo Creek or New Alamo Creek data sets; therefore, there would be no impact to these alternatives' objectives. Staff responded above to the possible adjustments to the data sets used to derive Alternative 4A and 4B objectives.

As the reviewer has acknowledged in his comment, the assumed water consumption rate of 2L/day for a 70-year lifetime is extremely conservative for this site, and thus the risk characterization associated with each set of alternative objectives, which is acceptable, is highly conservative. Based on this reality, any effect of modified estimates of the concentration (as the reviewer's comment has discussed above) on risk levels would still result in acceptable, highly conservative risk estimates for the alternatives, due to the expected level of consumption being at or near zero vs. the conservatively high assumption of 2L/day for a 70-year lifetime used to derive risk estimates for each alternative set of objectives. Moreover, an issue of great importance to Central Valley Water Board staff is that Alternative 4A or 4B objectives, if implemented, conform to the state antidegradation policy with regard to DCBM, DCBM, and chloroform. Modifying the data distribution for these constituents at Brown-Alamo Dam in an effort to make a more statistically rich data set from which to derive Alternative 4A objectives runs the risk of deriving Alternative 4A objectives that are not consistent with historical observations and thus could allow for further degradation of water quality within the segments with regard to DCBM, DCBM, and chloroform. As for Alternative 4B objectives, as the reviewer indicates, the measured data set is already sufficiently robust statistically so as to not need any imputing. Based on these considerations, and staff recommendation of

Alternative 4B objectives, staff do not believe that further evaluation of how imputing the Brown-Alamo Dam data set may affect risk levels estimated for Alternative 4A objectives is warranted.

ISSUE #2. *THE APPROACH FOR 'REASONABLE POTENTIAL' ABOVE SITE-SPECIFIC OBJECTIVES WOULD BE APPROPRIATE AND EFFECTIVE.*

Summary of *Comment #2*: *"The approach to determining 'reasonable potential' would be appropriate and effective in determining whether point source discharges into Old Alamo Creek (a water body for which MUN is not a designated beneficial use) have reasonable potential to cause or contribute to an excursion above the site-specific THM objectives within segments.*

The approach appears to be 'reasonable' subject to the minor concerns in my response to calculations in Questions 1 and 3. Most of the concerns regarding statistical modeling and estimation are of much less concern for Alternative 4B which uses the richer data at the terminus of Old Alamo Creek (OAC). And the policy of (at a minimum) twice monthly monitoring of effluent and of the terminus of OAC between November and March would appear to be a sufficient monitoring approach."

Response to Comment: Comment noted. No response required.

ISSUE #3. *THE 'ATTENUATION FACTOR' AS PROPOSED, IS A TECHNICALLY SOUND APPROACH TO DERIVE EFFLUENT LIMITS FROM SITE-SPECIFIC OBJECTIVES.*

***Summary of Comment #3(a)*:** *The peer reviewer notes that the attenuation values used to derive the attenuation factor are based on measuring the values at the discharge location and Brown Alamo Dam on the same day "Is this the best way to 'measure' the attenuation? That is, given the variability in concentrations at the two locations, given the time for the 'water' and pollutants to travel, etc., should they be computed this way? An expert in water dynamics might easily refute this concern."*

Response to Comment: This is appropriate given the travel time from the discharge point to the terminus of Old Alamo Creek and to Brown-Alamo Dam, which is less than 24 hours. Old Alamo Creek and New Alamo Creek are low flowing, intermittent streams, and their flow varies depending on weather conditions and whether agricultural discharges are occurring. Therefore, the time for water to travel between the discharge location to the end of Old Alamo Creek or to the Brown-Alamo Dam is not a constant. In addition, due to the nature of wastewater, it is reasonable to assume that the concentrations of the THMs in the effluent vary temporally more over time periods of hours or days. To accommodate the expectation that samples collected at the end of Old Alamo Creek or at Brown Alamo Dam are collected in a manner that facilitates sound

estimates of the attenuation factor at that time, the Basin Plan amendment language will be modified to specify that the effluent should be sampled before sampling at the end of Old Alamo Creek or the Brown Alamo Dam.

Summary of *Comment #3(b)*: *"Is the attenuation factor (in principle), constant given the original concentration? Given the lack of larger values in the Brown-Alamo Dam data, if the attenuation factor increased with 'baseline' concentration, the estimate could be biased low. It would be important to assess this. This is less of an issue with Alternative 4B given the more 'dense' data at the terminus of OAC."*

Response to Comment: No, the attenuation factor is not constant for a given Easterly WWTP effluent concentration, for the reasons discussed above (see Response to Comment #3(a)). As described in the report, the attenuation factor would be determined from data collected throughout the year. This approach would address variability in concentration and attenuation factor that may occur due to dilution, water temperature, air temperature, and initial concentration at the point of discharge. Past and future monitoring data (i.e., all representative historical data) would be used to calculate the median attenuation factor to be used for NPDES permitting purposes, if permit limitations are needed. This is appropriate because these objectives are for the protection of human health over long-term (i.e., lifetime) exposures, not short-term exposures. In addition, for Alternatives 2 through 4A, the proposed Basin Plan amendment specifies that dischargers must collect samples monthly for one year during the 5-year term of the NPDES permit. For Alternative 4B, samples will be collected twice monthly during the November through March period for one year during the 5-year term of the NPDES permit. These samples will provide the additional assurance that the derived attenuation factor accurately represents the conditions in the creek at the time effluent limitations were being stipulated in a permit.

Summary of *Comment #3(c)*: *"Similar to my earlier comments on risk calculations in Question 1, should some sort of weighting be used to have more recent data 'count more' in computing the attenuation factor?"*

Response to Comment: No weighting is necessary because there are no temporal trends observed for sample attenuation factors and because future data collected would be added to the existing data set, and all representative historical data would be used to determine the median attenuation factor for use in NPDES permitting.

The Basin Plan amendment language requires that "all representative historical data" be used to derive the attenuation factor. The language provides permit writers with flexibility as provided in the *State Water Resources Control Board, Policy for Implementation of Toxics Standards for Inland Waters, Enclosed Bays, and Estuaries of California* (SIP). Specifically, Section 1.2 of the SIP states:

*"**1.2 Data Requirements and Adjustments***
*The RWQCB may adjust the criteria/objective for metals with *discharger-specific Water Effect Ratios established in accordance with U.S. EPA guidance - Interim Guidance on Determination and Use of Water Effect Ratios for Metals (EPA-823-B-94-001) or Streamlined Water-Effect Ratio Procedure for Discharges of Copper (EPA-822-R-01-005), if appropriate.*

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 RWQCB shall have discretion to consider if any data are inappropriate or insufficient for use in implementing this Policy. Instances where such consideration is warranted include, but are not limited to, the following: evidence that a sample has been erroneously reported or is not representative of effluent or ambient receiving water quality; questionable quality control/quality assurance practices; and varying seasonal conditions. The lack of a site-specific objective for a priority pollutant shall not be considered insufficient data.

When implementing the provisions of this Policy, the RWQCB shall ensure that criteria/objectives are properly adjusted for hardness or pH, if applicable, using the hardness or pH values for the receiving water, and that translators are appropriately applied (in accordance with section 1.4.1), if applicable. The RWQCB shall also ensure that pollutant and flow data are expressed in the appropriate forms and units for purposes of comparability and calculations."

Summary of *Comment #3(d)*: *"The 'missing' larger values at Brown Alamo Dam (BAD) could impact computation of mean and sd for the AMEL and MDEL multipliers."*

Response to Comment: The AMEL and MDEL multipliers would be based on data available at the time the NPDES permit was being renewed, not just the existing data set as of the time the Draft Staff Report was prepared. As noted in the response to Comment #3c, the proposed Basin Plan amendment specifies that dischargers must collect samples monthly for one year during the 5-year term of the NPDES permit for Alternatives 2-4A. For Alternative 4B, samples will be collected twice monthly during the November through March period for one year during the 5-year term of the NPDES permit. These samples will provide the additional assurance that the derived AMEL and MDEL multipliers are appropriate for the discharge and creek conditions at the time of permitting.

Summary of *Comment #3(e)*: *"It is not clear what data will be used for the attenuation factor in this monitoring: will it be 1) previous year's data? 2) previous*

x years of data? (if so , what is 'x')? 3) most recent of each month (November through March)? This should be clarified in the regulations and relevant issues above addressed (depending on which of options 1-3 used)."

Response to Comment: The attenuation factor is used in the calculation of effluent limitations derived for long-term human health criteria, and thus future and past monitoring data would be used to determine the attenuation factor as described in the report. For Alternative 4A (see Draft Staff Report, p. 20): "The Attenuation Factor would be the median of the individual sample attenuation values between the effluent discharge location and Brown-Alamo Dam on New Alamo Creek derived from all representative historical data [emphasis added]*."*

For Alternative 4B (see Draft Staff Report, p. 22): "Based on the hydrologic characteristics of Old Alamo Creek, the Attenuation Factor would be the median of the individual sample attenuation values between the effluent discharge location and the terminus of Old Alamo Creek derived from all representative historical data for the 1 November through 31 March period of each year [emphasis added]*."*

As noted in the response to Comment #3d, the Basin Plan amendment language requires that "all representative historical data" be used to derive the attenuation factor. This language allows the permit writer flexibility as allowed in section 1.2 of the SIP to determine whether the data is valid, relevant, and representative of the situation at the time of permitting.

Upon the proposed site-specific objectives becoming effective, and reasonable potential being found for a discharger to the segments such that effluent limitations based on the site-specific objectives are needed, all historical sample attenuation values that accurately represent the discharge and receiving water conditions being permitted would be used for determining the median attenuation value for use in deriving effluent limitations. Available historical data would only be eliminated from use (for determining the proper attenuation value for deriving effluent limitations) if Central Valley Water Board permitting staff determine that such data no longer represent the condition being permitted. If, for example, operations of New Alamo Creek change, thus changing the seasonal flow regime, relative to historic operations, then only data collected under the current operations would be used in order to assure that effluent limitations are reflective of current and anticipated future discharge and receiving water conditions, and are not biased by past conditions that no longer occur.

Summary of *Comment* #3: *""The 'attenuation factor' as proposed, is a technically sound approach to derive the effluent limits, which apply to discharges into Old Alamo Creek, from the site-specific objectives applicable to the lower segments of New Alamo Creek and Ulatis Creek.*

"The authors of the report state that one reason for preferring Alternative 4B over 4A (in terms of the location) would be that Alternative 4B addresses the dilution credit and ambient background concentration according to SIP procedures rather [than] *in the attenuation factor as the other alternatives do. Another reason is that the concentration distribution at the terminus OAC used for Alternative 4B has less issues than corresponding distribution at BAD used for other Alternatives (in particular, for 4A). As such, the proposed plan for monitoring (twice monthly at the terminus of OAC) would appear to be the best approach to calculating the attenuation factor and would minimize the (minor) concerns stated above."*

Response to Comment: Comment noted. No response required.

ISSUE #4. *SUMMARY.*

Summary of *"Summary":* *"The staff recommends Alternative 4B. By using this alternative (and monitoring at the terminus of Old Alamo Creek) the largest available historical monitoring data can be utilized which lessens many of the (minor) concerns discussed above. In any case, the issues discussed above could be addressed (with minimal difficulty) via some additional sensitivity analyses. I concur with the staff recommendation of Alternative 4B and in my expert opinion, this amendment will provide adequate protection of human health."*

Response to Comment: Comment noted. No response required.

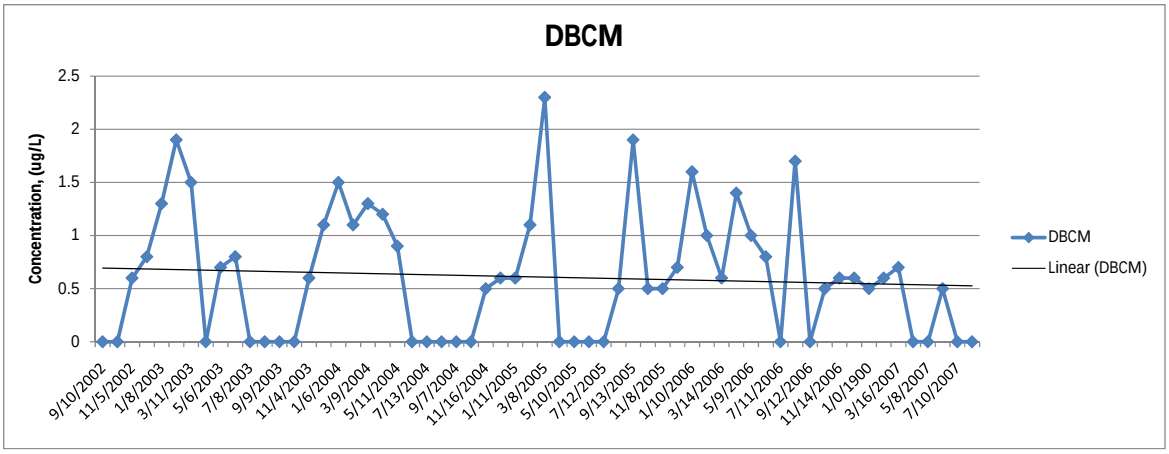

Figure 1. DBCM at end of Old Alamo Creek (OAC).

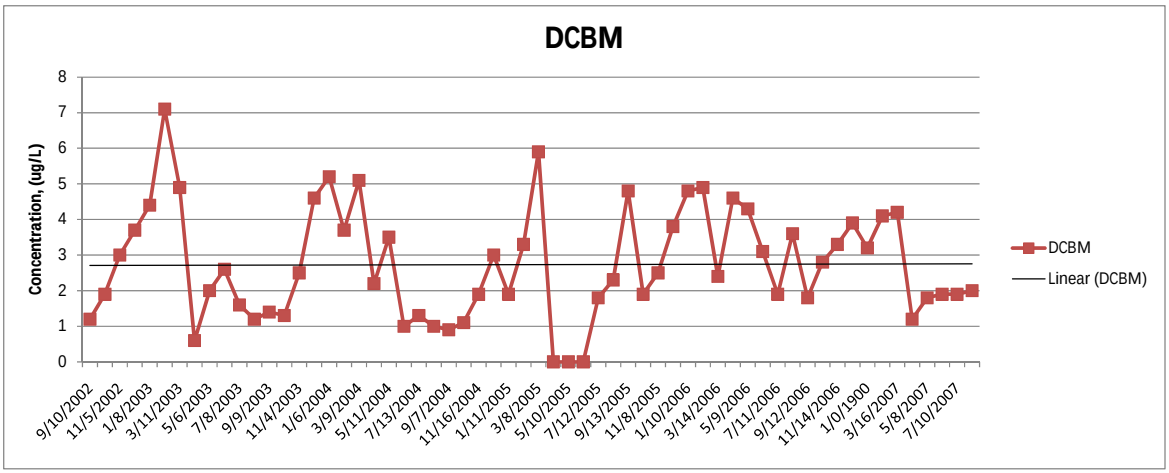

Figure 2. DCBM at end of Old Alamo Creek (OAC).

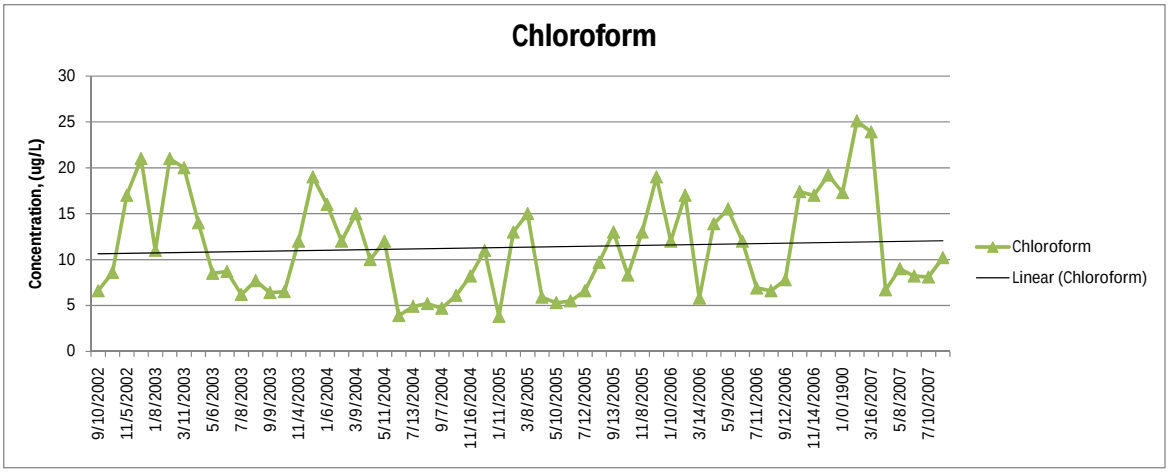

Figure 3. Chloroform at end of Old Alamo Creek (OAC).