Bryan Speegle, Director

COUNTY OF ORANGE

RESOURCES & DEVELOPMENT MANAGEMENT DEPARTMENT

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October 20, 2006

Song Her, Clerk to the Board
State Water Resources Control Board
Executive Office
1001 I Street, 24th Floor
Sacramento, California 95814

RE: Proposed 2006 Clean Water Act (CWA) Section 303(d) List and Revision of the CWA Section 303(d) List of Water Quality Limited Segments Response to Comments

Dear Ms. Her:

The County of Orange, Resources and Development Management Department is pleased to submit comments on the Proposed 2006 CWA Section 303(d) list and Revision of the CWA Section 303(d) List of Water Quality Limited Segments Response to Comments. The comments in this letter focus on all Orange County waterbodies except those in the Newport Bay/San Diego Creek watershed. A separate letter will be sent on the specific Newport Bay/San Diego Creek watershed listings.

We would like to commend the State Board for the improvement in this year's listing process through the implementation of the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List. The new policy has resulted in a more transparent process to develop a 303(d) list based on a clearly defined review of data of defined quality and quantity and the application of identified water quality standards and evaluation levels. In a number of instances, however, we have identified misapplications of the policy. Outlined below are our general policy and listing-specific technical issues, and recommendations for changes to the proposed 2006 303(d) list.

General Policy Issues:

1. **Listings based on data that is not spatially representative (responses to comments 17.1, 17.7 and 17.10):** This issue applies to listings for English Canyon (benzo[b]fluoranthene, dieldrin, sediment toxicity); and Laguna Canyon Channel (sediment toxicity). These listings apply to the water bodies in their entirety and are based on a very limited number samples taken from only one sampling location. Section 6.1.5.2 of the Listing Policy states that "Samples should be representative of the water body segment. To the extent possible, samples should represent statistically or in a consistent targeted manner the

segment of the water body." The SWRCB responses to these comments do not address the issue of the lack of spatial representation from samples taken from one location. The responses to comments states that under Sections 6.1.5.2 and 6.1.5.3 of the Listing Policy, data from one location collected over a period of 8 months can be used to support a listing recommendation. This is erroneous. Sections 6.1.5.2 and 6.1.5.3 address separate issues regarding the representativeness of data (6.1.5.2 addresses spatial representation and 6.1.5.3 addresses temporal representation), and do not relate to each other. The Listing Policy does not designate specific time periods for sample collection which would make one sampling location justified. Additionally, the temporal representation of samples has no bearing on whether one sampling location is spatially representative of the entire waterbody. Samples taken from only one sampling location are not generally representative of the water body segment and should not be the sole basis for placement of the entire waterbody on the 303(d) list. In such cases, we recommend:

a. Re-evaluating the water body for listing in future cycles after additional data from samples which represent statistically or in a consistent targeted manner, as the Listing Policy calls for, the segment of the water body have been collected; or

b. Limiting the listing to the area of the waterbody of which the one sampling location is representative and the fact sheet should provide information that justifies the water segmentation. The fact sheets for Laguna Canyon Channel and English Canyon provide no information that indicates that the one sampling location is representative of the entire water body. Other listings in the Region that are based on one sampling location are limited to 1 mile (San Juan Creek for DDE, Oso Creek for Chloride, Sulfates and Total Dissolved Solids).

   For example: Limit the listing area of Laguna Canyon Channel to 1.6 miles. Fact Sheet Justification: The sampling site is characterized by a semi-natural soft sediment creek bed, vegetation along the stream banks and low density residential development. This sampling site lies at the downstream end of a 1.6 mile segment of the stream which shares similar physical characteristics. The middle segment lies between Highway 73 and the culvert just south of Dog Park. The remainder of the creek may be delineated into two additional, distinct segments which significantly differ from this segment. The upper 2.7 miles of the creek is largely undeveloped open space with a road running alongside the stream. Runoff from the road is mitigated by detention basins and wetlands restoration projects. The lower 2.6 miles of creek is entirely confined within manmade structures including pipes, culverts and concrete lined flood control channels. Given the distinct nature of the three segments which comprise this creek, it is unlikely that data collected at the single sampling point is characteristic of the entire watercourse.

2. **Fish Tissue Data:** The application of fish tissue data in the 303(d) listing process has several areas of concern.

    a. We reiterate our opposition to the use of the OEHHA screening values from the 1999 paper "Prevalence of Selected Target Chemical Contaminants in Sport Fish from Two California Lakes: Public Health Designed Screening Study" by Brodberg and Pollock. The paper states: "The SVs (Screening Values) are not intended as levels at which consumption advisories should be issued but are useful as a guide to identify fish species and chemicals from a limited data set, such as this one, for which more intensive sampling, analysis or health evaluation are to be recommended." (Brodberg, 4) Additionally, the screening values were calculated specifically for the California Lakes Study and were not intended to be used to determine beneficial use impairment in the lakes or other water bodies throughout the state. (Comment applies to listings for Anaheim Bay (PCBs), Balboa Beach (Dieldrin, PCBs), Huntington Beach State Park (PCBs), Seal Beach (PCBs) and Upper Newport Bay (PCBs)).

    b. We also reiterate our opposition to the use National Academy of Science (NAS) Guideline as an evaluation guideline for protection of aquatic life from bioaccumulation of toxic substances. We disagree with the SWRCB Response to Comment 17.13 which states that the NAS guidelines are "scientifically defensible for the protection of aquatic life." The NAS guidelines were published in 1973 and are based on information and data collected in the 1960s. Comparing the NAS guidelines to more recent evaluations of concentrations of chemicals in aquatic organism tissue and their apparent effects on aquatic life by the US Army Corps of Engineers and the US Environmental Protection Agency, show wide discrepancies between the NAS values and more recent information. We do not feel that the NAS guidelines are reliable values for evaluating the potential impacts of chemicals on aquatic life. Again, we recommend the SWRCB evaluate the USACOE Environmental Residue-Effects Database and the paper "Linkage of effects to Tissue Residue: Development of a Comprehensive Database for Aquatic Organisms Exposed to Inorganic and Organic Chemicals" by Jarvinen and Ankley, 1999. These sources provide more recent data collection and analysis efforts to develop guidelines for the protection of aquatic life from bioaccumulation of toxic substances.

    c. A response from the SWRCB was not provided for following comment submitted on January 17, 2006: We feel that fish tissue data alone should not be used for listing without corresponding water column and/or sediment data confirming the presence of the contaminant. Due to the migratory nature of most fish, particularly sport fish, the presence of contaminants in fish tissue caught at a particular location does not necessarily indicate that the exposure to the contaminant occurred at that location. In such cases, we recommend re-evaluating the water body for listing in future cycles after additional data has been collected. (Comment applies to: Anaheim Bay (PCBs), Balboa Beach (DDT, Dieldrin, PCBs),

Huntington Beach State Park (PCBs), Lower Newport Bay (DDT, PCBs), Upper Newport Bay (PCBs), Peters Canyon Channel (DDT, Toxaphene), and Seal Beach (PCBs)).

Water Body-Specific Technical Issues:

1. **Anaheim Bay PCB Listing Region 8, Response to Comment 17.4:** The response indicates a revised fact sheet for the Anaheim Bay PCB listing has been developed. It is not included in Volume III: Water Body Fact Sheets Supporting the Listing and Delisting Recommendations.

2. **Anaheim Bay Copper Listing Region 8:** In the September 2005 Fact Sheets Supporting "Do Not List" Recommendations, the Anaheim Bay Copper listing was assigned a "Do Not List" decision. No comments or responses to comments regarding this recommendation were included in the Response to Comments. However, the Anaheim Bay Copper listing remains on the Proposed 2006 CWA Section 303(d) list. This listing should be removed based on the following SWRCB Staff Report "Evaluation of Data and Information Related to the Clean Water Act Section 303(d) List of Water Quality Limited Segments Water Body Fact Sheets Supporting "Do Not List" Recommendations:

    a. Toxicity is observed but none of the samples exceeded the sediment quality guidelines.
        i. A new listing for sediment toxicity has been added to address the observed toxicity.

    b. Based on the readily available data and information, the weight of evidence indicates there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

3. **Pacific Ocean Shoreline, Aliso HSA, Pacific Ocean Shoreline, Dana Point HSA, Pacific Ocean Shoreline, Laguna Beach HSA, Pacific Ocean Shoreline, San Joaquin Hills HSA Listings Region 9:** The City of Laguna Beach submitted a statistical evaluation of data collected by the Orange County Health Care Agency and the South Orange County Wastewater Authority at the above beach locations from 1999-2004 for de-listing consideration to the San Diego RWQCB in September 2005. The SDRWQCB provided the statistical evaluation to the SWRCB on January 31, 2005. The data and analysis provided clearly show that the locations listed below meet the delisting critieria. According to Response to Comment 31.8, etc. these comments addressed new data and information that was not readily available to the SWRCB staff before the draft recommendations were released or focus on previous listings where data and information are not yet summarized. As a result, the completion of fact sheets for these data and information are being delayed until the next listing cycle to avoid further delay in completion of the 2006 303(d) List. It is also asserted that for waters were new data shows the water body should be removed from the list, the only consequence of delay is that the delisting status would possibly be identified during TMDL problem statement development. In the

case of the above named listings, this response is erroneous. The SDRWQCB is in the final review process for adopting the TMDL for Indicator Bacteria Project I - Beaches and Creeks in the San Diego Region, and has not assessed any data past 2002 to verify if impairment still exists at the areas despite multiple requests and formal comments from stakeholders. If the locations listed below are not removed from the 2006 303(d) list, they will be erroneously included in the TMDL adopted by the SDRWQCB.

Additionally, SDRWQCB staff has stated in meetings with stakeholders that the data used for the original listings of these areas is unknown and not verifiable. This is additional justification for the re-evaluation of the above listings using the complete data set provided by the City of Laguna Beach.

Specific Location	**303(d) Listing**
Laguna Beach at Lagunita Place/Blue Lagoon Place	Aliso HSA
1000 Steps Beach at Pacific Coast Hwy. (Hospital, 9th Avenue)	Dana Point HSA
Aliso Beach at Table Rock Drive	Dana Point HSA
Aliso Beach at West Street	Dana Point HSA
Laguna Beach at Ocean Ave	Laguna Beach HSA
Laguna Beach at Laguna Ave.	Laguna Beach HSA
Laguna Beach at Dumond Drive	Laguna Beach HSA
Heisler Park - North	San Joaquin Hills HSA

Thank you for the opportunity to provide comments on the 2006 proposed revisions to the California Clean Water Act Section 303(d) List. We look forward to working with the SWRCB in resolving these issues and producing an accurate and comprehensive list of impaired water bodies in the state of California. Please contact Amanda Carr at (714) 567-6367 if you have any questions regarding these comments.

Very truly yours,

Chris Crompton, Manager
Environmental Resources

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Matthew E. Cohen
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October 20, 2006

VIA EMAIL AND U.S. MAIL

Song Her
Clerk to the Board
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Re: Comment Letter - Ballona Creek Bacteria TMDL

Dear Ms. Her:

The City of Beverly Hills ("City") appreciates this opportunity to comment on the Proposed Amendment to the Water Quality Control Plan for the Los Angeles Region Incorporating a Total Maximum Daily Load for Bacteria in Ballona Creek, Ballona Estuary, and Sepulveda Channel ("Bacteria TMDL"). As discussed in its May 19, 2006 letter, the City has serious concerns regarding the Bacteria TMDL. These concerns were not fully addressed or resolved by the Regional Board prior to its adoption of the Bacteria TMDL. Rather than restate those arguments in this letter, the City is attaching its May 19, 2006 comment letter for the purpose of reasserting the arguments before the State Board.

Recent studies have indicated that E. coli and Enterococci regrowth in Storm Drain Water occur even in the absence of human or animal fecal input. For example, in a recent study entitled "*Growth of E. Coli and Enterococci in Storm Drain Water Biofilm*", Donna Ferguson and her associates from the Orange County Public Health Laboratory, Water Quality Department, found that high concentrations of Enterococcus and E. coli were present on biofilms in the Santa Ana River where human sewage was not present. In an experiment simulating storm-drain conditions, robust growth of enterococcus occurred on PVC pipes in the absence of any fecal contamination.

The current methods used to track and determine the presence or absence of unsafe pathogens in waterways is therefore called into question. The implementation plans presently contained in the Bacteria TMDL would require Stakeholders such as the City to be liable for ghost plumes of dangerous bacteria when in fact the waterways are completely safe.

The City respectfully requests that the State Board postpone incorporating the Bacteria TMDL into the Water Quality Control Plan for the Los Angeles Region until such time as the Regional Board and affected Stakeholders can conduct a thorough scientific study on the reliability of current bacteria tests and the effectiveness of the Regional Board's plan at eliminating bacteriological pollutants. Requiring Stakeholders to go forward with this plan without conducting further study would be an inefficient and unproductive use of public resources.

The City is dedicated to putting forth the resources required to properly address and mitigate excess bacteria discharges which may emanate from the City's storm drain system. Prior to dedicating the significant amount of resources required for this undertaking, however, the City asks that the State and Regional Board take the time to ensure that the prescribed cure is scientifically proven to achieve results. The City does not believe that the Bacteria TMDL as it is presently written is sufficient to adequately address the problems of alleged bacteria exceedances.

We look forward to your response to these comments as well as other comments submitted by the other Stakeholders.

Respectfully,

Matthew E. Cohen

Attachment

B0785-1317\925650v1.doc

cc: Lawrence Weiner, Esq. (*w/attachment*)
Shana Epstein, Esq. (*via email, w/attachment*)
Lisa Bond, Esq. (*w/attachment)*
David Gustavson (*via email, w/attachment*)

ATTACHMENT

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Matthew E. Cohen
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May 19, 2006

Via E-Mail and U.S. Mail

Ginachi Amah
California Regional Water Quality Control Board
Los Angeles Region
320 West Fourth Street, Suite 200
Los Angeles, CA 90013

Re: Comments on Draft Ballona Creek Total Maximum Daily Loads for Bacterial Indicator Densities in Ballona Creek, Ballona Estuary, & Sepulveda Channel

Dear Ms. Amah:

The City of Beverly Hills ("City") appreciates this opportunity to comment on the Draft "Total Maximum Daily Loads for Bacterial Indicator Densities in Ballona Creek, Ballona Estuary, & Sepulveda Channel" ("Draft TMDL"). We understand that the County of Los Angeles, Caltrans, and the City of Los Angeles are also submitting comments under separate cover. As discussed below, the City has serious concerns regarding the legality and viability of carrying out this TMDL.

1. The Draft TMDL Fails to Comply with Relevant Provisions of the California Environmental Quality Act

The City believes that the Draft TMDL violates the California Environmental Quality Act, set forth in Public Resources Code §§ 21000, *et seq.* ("CEQA"). CEQA requires the Regional Board to review any significant potential environmental impacts created by its actions. In the Draft TMDL, the Regional Board staff generally relies on a certification from the Secretary of Resources set forth in 14 California Code of Regulations section 15251(g) to avoid most of the documentary and procedural requirements of CEQA. We do not believe that the exemption applies here.

Public Resources Code section 21080.5(d)(2) provides that, in order to qualify for certification, a regulatory agency must ensure that:

> "The rules and regulations adopted by the administering agency for the regulatory program do all of the following:
>
> (A) Require that an activity will not be approved or adopted as proposed if there are feasible alternatives or feasible mitigation measures available that would substantially lessen a significant adverse effect that the activity may have on the environment.
>
> (B) Include guidelines for the orderly evaluation of proposed activities and the preparation of the plan or other written documentation in a manner consistent with the environmental protection purposes of the regulatory program.
>
> (C) Require the administering agency to consult with all public agencies that have jurisdiction, by law, with respect to the proposed activity.
>
> (D) Require that final action on the proposed activity include the written responses of the issuing authority to significant environmental points raised during the evaluation process. . . ."

The Regional Board's Draft TMDL fails to comply with even these basic requirements. The Draft TMDL does not list feasible alternatives or mitigation measures, nor does it include guidelines on how to prepare plans. This constitutes a violation of CEQA. Pub. Resources Code § 21080.5(d)(3)(A).

Even if the certification exception were to apply, the Draft TMDL still fails to satisfy CEQA. With a certified regulatory program, the Regional Board must satisfy the applicable regulatory requirements of CEQA, and conduct the equivalent of the required analysis of the environmental impacts and effects. Cal. Code Regs., tit. 14 §§ 15250, 15252. As part of this analysis, the Regional Board must conduct the equivalent of a preliminary review and initial study. Cal. Code Regs., tit. 14 § 15252, subd. (a). The preliminary review and initial study must include a description of the proposed activity, an analysis and informed determination with

respect to potential significant environmental impacts, a completed "environmental checklist," and a report providing a description of the proposed activity, reasonable alternatives, and mitigation measures to minimize any significant adverse impacts. Cal. Code Regs., tit. 14 §§ 15250, 15252. The checklist prepared by the Regional Board fails to meet these basic CEQA requirements.

Under CEQA, the Regional Board must (1) determine whether the proposed TMDL will have a significant effect on the environment; and (2) prepare the functional equivalent of an Environmental Investigation Report ("EIR") if there is substantial evidence that any aspect of the project may cause a significant effect on the environment. Cal. Code Regs. §§ 15063, 15250, 15252. The Regional Board's checklist does not provide sufficient analysis of the impacts or offer evidence of ways in which the impacts can be mitigated to a level of insignificance. Pub. Resources Code §§ 21064.5, 21080.5, 21080 (c), Cal. Code Regs. §§ 15063, 15250, 15252.

The potential significant environmental effects that the Draft TMDL fails to adequately analyze include, but are not limited to, the following: (i) significant changes in the water quality as a result of the proposed implementation plans, including water flow disruptions, soil displacement, an increase in noise and traffic levels, changes in absorption rates, drainage patterns, and the amount of surface water runoff; (ii) significant impacts on public service and facilities such as fire and police protection, schools, parks and other recreational facilities, maintenance of public facilities and roads, and other governmental services; (iii) significant impacts on utilities and service systems for water and storm water drainage. The failure of the Regional Board to undertake a proper study of these impacts and consider the feasibility of alternative impacts results in the Draft TMDL's invalidation. ***City of Arcadia v. State Water Resources Control Board*** (2006) 135 Cal. App. 4th 1392, 1426.

2. The Draft TMDL Fails to Consider Other Sources of Pollution

As discussed in U.S. Environmental Protection Agency's ("EPA's") "Guidance for Developing TMDLs in California", 40 C.F.R. § 130.2(i) and 40 C.F.R. § 130.7(c)(1) require that point, nonpoint and background sources of pollutants of concern be described in the TMDL, including the magnitude and location of such sources. The Draft TMDL assumes that the vast majority of bacteria present in the

impaired creek and estuary is attributable and subject to the sole control of the alleged dischargers. There appears to be no mention of the affects, for example, that storm water runoff from Franklin Canyon Park will have on Reach 1. Also, little, if any, effort appears to have been made to quantify other non-point sources such as direct inputs from birds and other wildlife.[1]

Specifically, no effort appears to have been made to determine the bacteria, nutrient, and sediment contribution from facilities over which neither the City nor any of the other named dischargers have jurisdiction, such as school districts, water districts, state entities, and private landowners. The Regional Board could feasibly exercise regulatory jurisdiction over these facilities. As a matter of public policy, it is inequitable to place the entire burden of monitoring and mitigating these facilities solely on the alleged dischargers enumerated in the Draft TMDL.

3. Compliance Within the Proposed Time Frame Would be Unrealistic

The Draft TMDL imposes stringent time limits for the coordination, funding, submission, and realization of a TMDL Implementation Plan. According to the Draft TMDL, monitoring plans must be in place within twelve months and the parties have ten years to reach full compliance. Furthermore, the City is expected to undertake massive infrastructure projects to meet the stated goals for year six, while the entire plan itself is subject to revision at year four. Given the size of the project, the number of agencies involved, and the lack of solid data underlying the TMDL goals, such a timeframe is highly unrealistic.

4. The Draft TMDL Amounts to an Unfunded Mandate

By requiring compliance with the Draft TMDL, the Regional Board has imposed new programs and/or has required a higher level of service of existing programs that are not required or mandated under the Clean Water Act or any federal regulations thereunder. The imposition of unfunded programs and mandates in the Draft TMDL is inconsistent with the provisions of the California Constitution, specifically Article XIII B, Section 6, which requires a state agency which mandates a new program or a higher level of service to provide a "subvention" of

[1] The Draft TMDL acknowledges as much on page 21 of the Staff Report, when it states: "Data do not currently exist to quantify the extent of the impact of wildlife on bacteria water quality in the Estuary."

funds to reimburse local governments for the costs of the program or increased level of service.

The Draft TMDL does not fully consider the fiscal impact on cities. The Draft TMDL will require a substantial capital investment, which individual cities will have to fund, despite the fact that no funding mechanism, nor any assistance, financial or otherwise, is being provided to the cities. To our knowledge, the Regional Board has made no provision for funding the massive public works projects it has proposed in the current draft.

The Regional Board purports to rely on Water Code section 13267 as well as section 303(d) of the Clean Water Act for the authority to undertake this investigation.[2] Article XIII B, Section 6 of the Constitution prevents the state from shifting the cost of government from itself to local agencies without providing a "subvention of funds to reimburse that local government for the costs of the program or increased level of service . . ." State agencies are not free to shift state costs to local agencies without providing funding merely because those costs were imposed upon the state by the federal government. If the state freely chooses to impose costs upon a local agency as a means of implementing a federal program, then those costs should be reimbursed by the state agency. *See* ***Hayes v. Commission on State Mandates*** (1992) 11 Cal. App. 4th 1564, 1593-1594. If the state refuses to appropriate money to reimburse a city, the enforcement of the state mandate can potentially be enjoined by a court. *See* ***Lucia Mar Unified School District v. Honig*** (1988) 44 Cal. 3d 830, 833-834.

The Draft TMDL contains new programs and mandates that go beyond the specific requirements of either the Clean Water Act or the EPA's regulations implementing the Clean Water Act. This includes, but is not limited to, the development of massive public works projects to alter the normal flow patterns of the Ballona Creek watershed as well as the rigorous requirements to monitor unimpaired waters. If the Regional Board wishes to impose this program, it needs to provide a means to pay for its implementation.

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[2] Section 303(d) of the Clean Water Act is codified at 33 U.S.C. section 1313(d).

The Draft TMDL contains numerous data collection requirements. These activities go beyond the requirements of EPA's regulations implementing the Clean Water Act. Any information collection demands mandated by federal regulations must be submitted for approval to the Office of Management and Budget under the provisions of the Paperwork Reduction Act. 44 U.S.C. §§3501 *et seq.*

Implementing the programs outlined in the Draft TMDL would require the Permittees to collectively hire dozens of additional employees to implement these mandates. The City does not believe that these additional burdens were contemplated by EPA, nor are they consistent with the requirements of the federal Paperwork Reduction Act. *See* 44 U.S.C. §3507. Accordingly, these requirements may be invalid for failure to comply with the Paperwork Reduction Act.

5. <u>The Draft TMDL Does Not Undertake a Cost/Benefit Analysis</u>

By mandating compliance with this Draft TMDL, the Regional Board is asking the City to undertake efforts in excess of its requirements under the federal Clean Water Act. For example, section 303(d) of the Clean Water Act does not obligate States to undertake costly and detailed mitigation of unimpaired waters such as Centinela Creek and Del Rey Lagoon. *See* 33 U.S.C. § 1313. For this authority, the Regional Board relies on Water Code section 13267. When the Regional Board relies on California state law, consideration of economic factors is appropriate. ***City of Burbank v. State Water Resources Control Board*** (2005) 35 Cal. 4th 613, 627-628. The Regional Board has not properly analyzed the cost and economic impact of the Draft TMDL in the manner contemplated by the Clean Water Act and Water Code § 13241.

As part of the development and implementation of water quality control plans, federal and state law provide that a Regional Board must consider specific factors in formulating appropriate water quality objectives. 33 U.S.C. § 1313; Water Code § 13241. These factors include, but are not limited to, the following: (1) the past, present, and probable future beneficial uses of water; (2) the environmental characteristics of the hydrographic unit under consideration, including the quality of water available to that unit; (3) water quality conditions that could reasonably be achieved through the coordinated control of all factors that affect water quality in the area; (4) *economic considerations*; (5) the need for developing housing within

the region; and (6) the need to develop and use recycled water. Water Code § 13241; *See also*, 40 C.F.R. §§ 130-131.

One particular, but by no means the only, example of where the Draft TMDL fails to factor in costs is with respect to the aggressive sampling schedule. It appears that the Operation and Maintenance cost estimates in the Draft TMDL do not factor in the costs to the City of undertaking such sampling. Over the course of the ten to fourteen-year proposed implementation plan period, the costs associated with undertaking such an aggressive program are likely to be significant.

Additionally, although the Regional Board may be able to require a local agency to investigate and report on any technical factors involved in water quality, the economic burden, including the costs of such reports, must bear a reasonable relationship to the need for the report and the benefits to be obtained therefrom. Water Code §§ 13165, 13225(c), 13267(b).

Even if the Draft TMDL did not exceed of the requirements under the federal Clean Water Act, consideration of economic factors would still be appropriate. Section 1251(a)(2) of title 33 United States Code sets as a national goal, "*wherever attainable*," an interim goal of water quality. Furthermore, section 1313(c)(2)(A) of title 33 United States Code requires consideration of "*use and value*" when revising or adopting a new standard. These statutes obligate the Regional Board to consider economic factors whenever it seeks to alter or adopt water quality standards. ***See City of Burbank***, *supra*, 35 Cal. 4th at 627.

6. The Scientific Methodology Employed is Vague and Incomplete

All TMDLs must be based on sound science and must be established in accordance with state and federal regulations, which provide for informed decision making and opportunities for meaningful public input. 40 C.F.R. 130.7(c) Numeric water quality target(s) for a TMDL must be identified, and an adequate basis for target(s) as interpretation of water quality standards must be specifically documented in the submittal. 40 C.F.R. 130.7(c)(1).

The scientific analysis outlined in the Draft TMDL fails to provide sufficient detail regarding the parameters for establishing a TMDL in the various segments of the Ballona Creek watershed. The Ballona Creek watershed ecosystem is influenced

by a myriad of environmental factors not applicable to other creeks, lagoons, and beaches in the region. The reference point present in the Draft TMDL for establishing the number of exceedance days appears to be based on information from Leo Carillo beach. This beach exhibits dramatically different ecological conditions than those found in the Ballona Creek watershed. The use of this beach as a reference point does not account for those differences.

Additionally, the data supporting the Draft TMDL is built upon a shaky scientific foundation. In many cases, the data that the Regional Board relied on for the purposes of establishing the TMDL is often based on extremely small sample sizes. For example, in Table 4-4, which provides a summary of bacteria densities from various land uses during wet weather, only one of the thirteen study areas had a sample size of more than ten. By contrast, ten study areas had sample sizes less than or equal to five. Small sample sizes such as these preclude the Regional Board from establishing statistically significant extrapolations. Before mandating a costly and time consuming research order, the Regional Board should undertake further study to develop ecosystem appropriate criteria.

By not subjecting the Draft TMDL to scientific peer review, the Regional Board fails to comply with Health and Safety Code section 57004. Health and Safety Code section 57004(d) provides in pertinent part:

> "No board, department, or office within the agency shall take any action to adopt the final version of a rule unless all of the following conditions are met:
>
> (1) The board, department, or office submits the scientific portions of the proposed rule, along with a statement of the scientific findings, conclusions, and assumptions on which the scientific portions of the proposed rule are based and the supporting scientific data, studies, and other appropriate materials, to the external scientific peer review entity for its evaluation.
>
> (2) The external scientific peer review entity, within the timeframe agreed upon by the board, department, or office and the external scientific peer review entity, prepares a written report that contains an evaluation of the scientific basis of the proposed rule. If the external scientific peer review entity finds that the board, department, or office has failed to demonstrate

> that the scientific portion of the proposed rule is based upon sound scientific knowledge, methods, and practices, the report shall state that finding, and the reasons explaining the finding, within the agreed-upon timeframe. The board, department, or office may accept the finding of the external scientific peer review entity, in whole, or in part, and may revise the scientific portions of the proposed rule accordingly. If the board, department, or office disagrees with any aspect of the finding of the external scientific peer review entity, it shall explain, and include as part of the rulemaking record, its basis for arriving at such a determination in the adoption of the final rule, including the reasons why it has determined that the scientific portions of the proposed rule are based on sound scientific knowledge, methods, and practices. . . ."

The term "rule" is defined in Health and Safety Code section 57004(a)(1) as either:

> "(A) A regulation, as defined in Section 11342.600 of the Government Code.
>
> (B) A policy adopted by the State Water Resources Control Board pursuant to the Porter-Cologne Water Quality Control Act (Division 7 (commencing with Section 13000) of the Water Code) that has the effect of a regulation and that is adopted in order to implement or make effective a statute."

Health and Safety Code section 57004(2) defines the terms "scientific basis" and "scientific portions" as:

> "[T]hose foundations of a rule that are premised upon, or derived from, empirical data or other scientific findings, conclusions, or assumptions establishing a regulatory level, standard, or other requirement for the protection of public health or the environment."

There is nothing in the Draft TMDL, or related documents, which indicates that the Regional Board has complied with Health and Safety Code section 57004 in drafting or adopting the Draft TMDL, or that there was any scientific peer review of any aspect of the Draft TMDL.

7. **The Draft TMDL Does Not Comply with the Administrative Procedures Act**

The Administrative Procedures Act (Cal. Gov. Code § 11340, et seq. (the "APA") applies to the Regional Board's adoption of the TMDLs. The proposed TMDL does not comply with the requirements of the APA, including, but not limited to making a showing of "necessity," "authority," "clarity," "consistency," "reference" and "non-duplication." *See* Gov. Code § 11349.1(a).

* * *

In conclusion, the Draft TMDL still needs substantial revision and modification. The Draft TMDL does not adequately consider the unique characteristics and challenges present in requiring the City to undertake this regulation. The burdens that the Regional Board seeks to impose will have a profound impact on the City and its residents. This burden is disproportionate to the City's alleged discharges into the Ballona Creek watershed.

The City reserves its right to make objections and request additional information and documents from Regional Board staff at the hearing. Additionally, the City hereby attaches its May 12, 2006 letter to the Regional Board requesting clarification on the hearing procedures for the June 8, 2006 public hearing, as well as the May 19, 2006 written response of Mr. Michael J. Levy, Senior Staff Counsel at the State Water Resources Control Board. The City asks that these documents, as well as all other documents submitted to the Regional Board in response to the Ballona Creek Bacteria TMDL, be incorporated into the Administrative Record.

Despite the concerns, the City is prepared to continue to engage in a constructive dialogue with Regional Board staff to develop a TMDL that will make genuine progress toward our common objective of controlling pollutants in the Ballona Creek watershed to the maximum extent practicable.

We look forward to your response to these comments as well as other comments submitted by the County and other cities and agencies.

Respectfully submitted,

Matthew E. Cohen

B0785-1317\887791v1.doc
Enclosures

cc: Melinda Becker
Jonathon Bishop

STATE OF CALIFORNIA—THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, *Governor*

DEPARTMENT OF FORESTRY AND FIRE PROTECTION

P.O. Box 944246
SACRAMENTO, CA 94244-2460
Website: www.fire.ca.gov
(916) 653-0719

R50

October 19, 2006

Ms. Tam M. Doduc, Chair
c/o Song Her, Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, California 95814

Dear Chair Doduc:

Subject: Notice of Opportunity for Public Comment on the proposed 2006 Clean Water Act Section 303(d) List of Water Quality Limited Segments for California.

Thank you for the opportunity to comment on the proposed 2006 Clean Water Act Section 303(d) List of Water Quality Limited Segments for California. We would like to comment specifically on the proposed 303(d) listing of the Noyo River Hydrologic Area (HA) for water temperature. Our comments on the draft proposal included in a letter to the State Water Resources Control Board (SWRCB) dated January 31, 2006 have not been addressed in this proposal, and this proposal would affect the Jackson Demonstration State Forest (JDSF), which includes most to the South Fork Noyo River watershed upstream of its confluence with Kass Creek.

The proposed 303(d) water temperature guideline is 14.8°C based on a 7-day mean for the protection of Coho salmon, and cites "An Analysis of the Effects of Temperature on Salmonids of the Pacific Northwest with Implications for Selecting Temperature Criteria (Sullivan et. al., 2000)" (emphasis added).

The California Department of Forestry and Fire Protection (CDF) urges the SWRCB not to adopt this listing as currently proposed for the following reason. The proposed temperature guideline for the Noyo River watershed, which is located at 39.5° North latitude, is based on Sullivan et al., 2000 which was specifically written for conditions in the Pacific Northwest, primarily Washington State, which is north of 45.5° North latitude. All of the streams in Washington are least 5 degrees north of the Noyo River in California. By comparison, five degrees south of the Noyo River at 34.5° North latitude lies the Santa Ynez River near Santa Barbara. It is no more appropriate to apply a temperature guideline developed for conditions in Washington State to conditions in northern California, than it would be to apply a temperature guideline developed for conditions in Northern California to conditions in Southern California.

In a notation on our January 31, 2006 comment letter, SWRCB staff designated the content of the above paragraph as comment number 101.1. SWRCB staff responded to this comment as follows: "Data Exists that supports temperature impairment of these water bodies (2006 SWRCB Reponses to Comments p. 32)." SWRCB staff has not responded to the issue raised in our comment. The issue is that the water temperature standard used was developed for a different geographic region and therefore inappropriate, and it is not appropriate to compare Noyo River water temperature data to this standard for the purposes of listing Noyo River as impaired for water temperature.

If the SWRCB decides to adopt this listing as currently proposed, CDF strongly urges the SWRCB to exclude the South Fork of the Noyo River above its confluence with Kass Creek near the boundary of the JDSF. The South Fork of the Noyo River watershed above its confluence with Kass Creek is primarily comprised of the state forest lands managed under a JDSF Management Plan. There is ample water temperature data for the South Fork above its confluence with Kass Creek, none of which was cited in the SWRCB Fact Sheet as being used in the proposed 303(d) listing. Basically the South Fork Noyo was excluded from the analysis on which the proposed listing was based; it should therefore be excluded from the proposed listing. The proposed listing did not and can not establish that there is a water temperature problem affecting salmonid habitat on either the South Fork or downstream portions affected by the South Fork without analyzing this data.

In a notation on our January 31, 2006 comment letter, SWRCB designated the above paragraph as comment number 101.2. SWRCB staff did not respond to this comment.

Moreover, this data was analyzed and used in the preparation the new JDSF Management Plan and Environmental Impact Report (EIR) now nearing final form. The JDSF Management Plan and EIR fully address water temperature and salmonid habitat protection in the South Fork Noyo. The maximum weekly average temperature (MWAT) is defined as the highest average of mean daily temperatures over any 7-day period. In the JDSF Management Plan an MWAT value of 16.8°C was chosen as a threshold of significance. The National Marine Fisheries Services (NMFS) originally established 16.8° C as an MWAT threshold for Coho (BOF 2005).

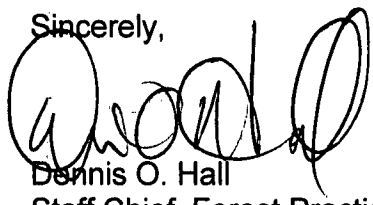
The Fact Sheet quotes the North Coast Basin Plan water quality objectives for temperature: "The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Quality Control Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased by more than 5°F (2.8C°) above natural receiving water temperature." The receiving water from the South fork is the main-stem of the Noyo River, and this standard is being met. In fact, water exiting the JDSF and then entering the main stem seven miles downstream of the JDSF boundary "appears to have a moderate cooling effect on water temperatures in the lower Noyo River depending upon the relative flow of the two streams (BOF 2005)."

For all of the above reasons, the South Fork Noyo River watershed above its confluence with Kass Creek near the JDSF boundary should be excluded from consideration for 303(d) listing for water temperature.

In conclusion, the 303(d) listing of the Noyo River watershed for water temperature should not be approved as proposed. Indeed, it may not be necessary at all if local climatic conditions properly considered. In any case, the South Fork of Noyo River watershed above Kass Creek near the JDSF boundary should not be included in the listing without (at a minimum) considering the available water temperature data from the South Fork Noyo River watershed.

Thank you again for the opportunity to comment on this matter. Please contact Clay Brandow of my staff at (916) 653-0719 or clay.brandow@fire.ca.gov if you have any questions on this matter.

Sincerely,



Dennis O. Hall
Staff Chief, Forest Practice

Enclosure

References Cited

Sullivan, K., D.J. Martin, R.D. Cardwell, J.E. Toll, and S. Duke. 2000. An analysis of the effects of temperature on salmonids of the Pacific Northwest with implications for selecting temperature criteria. Sustainable Ecosystems Institute, Portland, Oregon. 186 p. Found at: http://www.krisweb.com/biblio/gen_sei_sullivanetal_2000_tempfinal.pdf

California State Board of Forestry and Fire Protection (BOF). 2005. Draft Environmental Impact Report for the Draft Jackson Demonstration State Forest management plan. Prepared Under Contract by the California Department of Forestry and Fire Protection. Sacramento, California. Found at: http://www.fire.ca.gov/php/rsrc-mgt_jackson_deir_2005.php

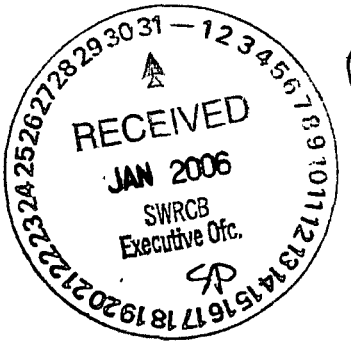
STATE OF CALIFORNIA—THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF FORESTRY AND FIRE PROTECTION
P.O. Box 944246
SACRAMENTO, CA 94244-2460
Website: www.fire.ca.gov
(916) 653-0719

677 R13

303 (d) Deadline: 1/31/06

January 31, 2006



120

P.S. 2715

Ms. Tam M. Doduc, Chair
c/o Selica Potter, Acting Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, California 95814
FAX: (916) 341-5620
Email: commentletters@waterboards.ca.gov

Dear Chair Doduc:

Subject: Request for Comment on the Draft Revision of the Clean Water Act Section 303(d) List of Water Quality Limited Segments.

Thank you for the opportunity to comment on the Draft Revision of the Clean Water Act Section 303(d) List of Water Quality Limited Segments. We would like to comment specifically on the proposed 303(d) listing of the Noyo River Hydrologic Area (HA) for water temperature. This draft proposal would affect the Jackson Demonstration State Forest (JDSF), which includes most to the South Fork Noyo River watershed upstream of its confluence with Kass Creek.

The draft 303(d) water temperature guideline is 14.8°C based on a 7-day mean for the protection of coho salmon, and cites "An Analysis of the Effects of Temperature on Salmonids of the Pacific Northwest with Implications for Selecting Temperature Criteria (Sullivan et. al., 2000)" (emphasis added).

The California Department of Forestry and Fire Protection (CDF) urges the State Water Resource Control Board (SWRCB) not to adopt this listing as currently proposed for the following reason. The proposed temperature guideline for the Noyo River watershed, which is located at 39.5° North latitude, is based on Sullivan et al., 2000 which was specifically written for conditions in the Pacific Northwest, primarily Washington State, which is North of 45.5° North latitude. Five degrees south of the Noyo River at 34.5° North latitude lies the Santa Ynez River near Santa Barbara. It is no more appropriate to apply a temperature guideline developed for conditions in Washington State to conditions in northern California, than it would be to apply a temperature guideline developed for conditions in northern California to conditions in southern California. (1)

If SWRCB decides to adopt this listing as currently proposed, CDF strongly urges the SWRCB to exclude the South Fork of the Noyo River above its confluence with Kass Creek near the boundary of the JDSF. The South Fork of the Noyo River watershed above its confluence with Kass Creek is primarily comprised of the state forest lands managed under a JDSF Management Plan. There is ample water temperature data for the South Fork above its confluence with Kass Creek, none of which was cited in the Fact Sheet as being used in the proposed 303(d) listing. Basically the South Fork Noyo was excluded from the analysis on which the proposed listing was based; it should therefore be excluded from the proposed listing. The proposed listing did not and could not establish that there is a water temperature problem affecting salmonid habitat on the either in the South Fork or downstream portions affected by the South Fork without analyzing this data. (2)

Moreover, this data was analyzed and used in the preparation the new JDSF Management Plan and Environmental Impact Report (EIR) now in public review. The JDSF Management Plan and EIR fully address water temperature and salmonid habitat protection in the South Fork Noyo. The maximum weekly average temperature (MWAT) is defined as the highest average of mean daily temperatures over any 7-day period. In the JDSF Management Plan an MWAT value of 16.8°C was chosen as a threshold of significance. The National Marine Fisheries Services (NMFS) originally established 16.8° C as an MWAT threshold for coho (BOF 2005).

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For all of the above reasons, the South Fork Noyo River watershed above its confluence with Kass Creek near the JDSF boundary should be excluded from consideration for 303(d) listing for water temperature.

In conclusion, the 303(d) listing of the Noyo River watershed for water temperature should not be approved as proposed. Indeed, it may not be necessary at all if local climatic conditions are properly considered. In any, case the South Fork of Noyo River watershed above Kass Creek near the JDSF boundary should not be included in the listing without (at a minimum) considering the available water temperature data from the South Fork Noyo River watershed.

Mission Viejo Country Club

Song Her, Clerk
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

October 20, 2006

Via Email: commentletters@waterboards.ca.gov

RE: Comment Letter – 2006 Federal CWA Section 303(d) List

Dear Ms. Her;

Thank you for the opportunity to comment on the proposed 303(d) list. We are commenting on the San Diego RWQCB listing for Oso Creek (at the Mission Viejo Golf Course) on page 12 of 29 of the September 13, 2006 listing document. Specifically, we disagree with the accuracy and characterization of this listing.

First, we acknowledge that the water quality in 4-mile long Oso Creek is impaired. Oso Creek collects urban runoff from over 8 square miles within the City of Mission Viejo. According to the September 2006 Fact Sheets Supporting Revision to the 303(d) list, 13 quarterly samples were collected from 1998-2001 by the Santa Margarita Water District (SMWD) and showed total dissolved solids, chloride and sulfate exceeding water quality objectives. According to SMWD staff, these quarterly samples were collected at the Oso Barrier, located on the last ½ mile of the creek. The purpose of the barrier is to take urban runoff collected by Oso Creek, screen it, and pump it to a reservoir for later use as a reclaimed water source for irrigation. Oso Barrier is located within the boundaries of the Mission Viejo Country Club. Refer to Figure 1.

The proposed listing indicates that 1 mile of the creek is impaired, but the Fact Sheet offers no rationale for this distance. We question the accuracy of this 1 mile distance because only 1 sample site was used and sampling was done at the last ½ mile of an 8.5 mile long creek that collects urban runoff from over 10 square miles of densely populated area containing over 100 catchment basins. Accordingly, we recommend that the estimated size affected be changed to "unknown" until such time as data becomes available to more accurately characterize the length of impairment.

Further, the proposed listing states "Oso Creek (at Mission Viejo Golf Course)", suggesting that it is the golf course that is responsible for the listing. We disagree that the listing has anything to do with the golf course and instead is almost assuredly due to the urban runoff entering Oso Creek upstream of the Oso Barrier. Accordingly, we recommend that the name of the water quality limited segment be changed to **"Oso Creek (at Oso Barrier)"**.

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Mission Viejo Country Club

The Mission Viejo Country Club is committed to being a good steward of Oso Creek. For example, we regularly practice numerous Best Management Practices (BMPs) to protect Oso Creek water quality including maintenance of vegetated buffers and restrictions on fertilizer use in the vicinity of the creek. Further, we plan to continue working closely with the County of Orange, SMWD, and the City of Mission Viejo to improve the creek environment.

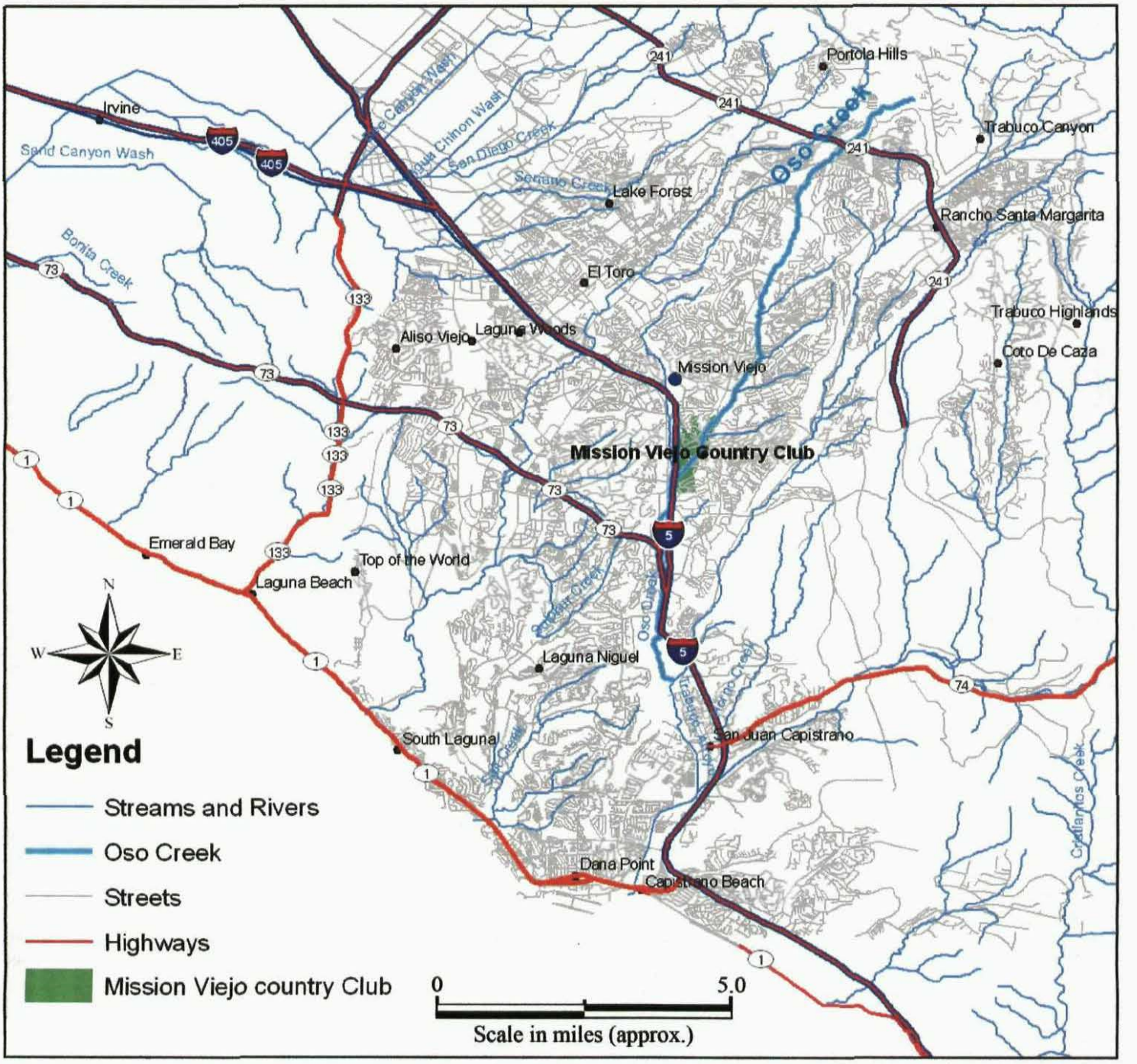
We appreciate the opportunity to comment on the proposed 303(d) listing. If you have any questions, please do not hesitate to call me.

Sincerely,

Rick Beymer
General Manager

CC:
Amanda Carr, County of Orange
Richard Schlesinger, City of Mission Viejo
Daniel Ferons, Santa Margarita Water District

26200 COUNTRY CLUB DRIVE • MISSION VIEJO, CA 92691-5905 • (949) 582-1550 • FAX (949) 582-3875



Blankinship & Associates, Inc.
Agricultural & Environmental Scientists & Engineers
322 C Street, Davis, CA 95616
Tel. 530.757.0941 Fax 530.757.0940
www.envtox.com

Oso Creek Watershed

Mission Viejo, California

Project	Figure
Mission Viejo Country Club	1
Date 19 Oct. 2006	

RickB

From: Mike Blankinship [blankinship@envtox.com]
Sent: Friday, October 20, 2006 11:31 AM
To: RickB
Subject: Resend

Rick: here is a cut/paste of the last email…..

I will also print and fax.

Hi All;

Checking in.

Rick: I trust that you received my final revised letter yesterday (see below). For purposes of transmitting the letter, please see SWRCB instructions below.

Comment letters on the revisions must be received by 5 p.m. on October 20, 2006. After this deadline, State Water Board staff will not accept additional written comments.

Please send comments to: Song Her, Clerk to the Board, by e-mail at commentletters@waterboards.ca.gov. Please also indicate in the subject line, "Comment Letter - 2006 Federal CWA Section 303(d) List."

As Jon and I discussed yesterday, it can't hurt to send a certified letter. Last, fax your letter to (916) 341-5620.

Give me a call with any questions.

Thanks,

Mike

Mike

Blankinship & Associates, Inc.
Agricultural & Environmental
Science & Engineering
322 C St.
Davis, CA 95616
530.757.0941 fax 530.757.0940
envtox.com

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

100 NORTH CANYONS PARKWAY, LIVERMORE, CA 94551 PHONE (925) 454-5000

October 20, 2006

Ms. Song Her, Clerk to the Board
State Water Resources Control Board
Executive Office
1001 I Street, 24th Floor
Sacramento, CA 95814

Subject: ***Comment Letter – 2006 Federal CWA Section 303(d) List***

Dear Ms. Her:

Zone 7 has reviewed the State Water Resources Control Board's (State Board's) Proposed 2006 Federal Clean Water Act Section 303(d) List of Water Quality Limited Segments for California (2006 List). Zone 7 has the following comments on the proposed listing of the Del Valle Reservoir as an impaired water body for mercury and polychlorinated biphenyls (PCBs).

The Del Valle Reservoir is a raw water source for the South Bay Aqueduct contractors (Zone 7 Water Agency, Alameda County Water District, and the Santa Clara Valley Water District). Due to the fact that Del Valle Reservoir is a water supply source that is a critical part of the State Water Project, we again request that the State Water Board take a more prudent course for this particular water body and consider the factors described below so as to avoid making a premature designation that lacks solid support from the currently available scientific data.

The State Board's response to Zone 7's and the Department of Water Resources' previous comments (91.2 and 102.1, respectively) regarding removing the reservoir from the list, is as follows: "*Without additional monitoring data to show that the water body is meeting water quality standards*, it is not possible to remove this water body from the list" [emphasis added]. However, the State Board is basing the proposed listing of the Del Valle Reservoir on a one-time sampling event that occurred in April 2001. From our understanding, additional fish tissue sampling *had*, in fact, been completed at the end of 2005 through the Surface Water Ambient Monitoring Program (SWAMP) and the results were to be available within the following six months. The fact sheets attached to the 2006 List do not indicate that these additional SWAMP sampling results were considered. Our January 31, 2006 letter also stated that available historical water quality data indicated that no mercury or PCBs were present in the reservoir.[1] Since the data are available, both the results from the additional SWAMP sampling event and the historical water quality data provided herein should be considered in determining whether or not to include Lake Del Valle in the 2006 list.

Furthermore, the proposed listing is based solely on fish tissue samples collected in April 2001. Catfish and largemouth bass were found to exceed the mercury guideline, while catfish alone was found to exceed the PCB guidelines. The East Bay Regional Park District (EBRPD) stocks Del Valle

[1] PCB and mercury samples were collected from two different depths in Lake Del Valle and the resultant analytical results are attached.

Reservoir with both catfish and largemouth bass for recreational purposes. 70% of the stocking is done with small fish (approximately one-pound size) and the remaining 30% consists of "trophy size" fish. While the State Board's Water Quality Policy section 3.5 allows using fish tissue samples from transplanted populations as an indicator of whether a particular water body is impaired, in our opinion using a small sample of stocked fish (many of which are already "trophy size) as the sole indicator of the "impairment" of the water body seems inappropriate without supporting data (either water quality or sediment sampling).

A study[2] published earlier this year by the U.S. Fish & Wildlife Service and & the U.S. Geological Survey found that a potential source of pollutants in hatchery fish tissue is their food (comprised of meal and fish oil from pelagic, ocean fish). In fact, that study also indicated that organochlorine compounds such as PCB's were commonly found in hatchery fish food and bioaccumulated, biomagnified and/or bioconcentrated in the fish, themselves. This study suggests that other sources may be responsible for the pollutants found in the stocked fish tissue from Lake Del Valle.

As requested in our January 31, 2006 letter, we suggest that the State Board defer the listing of the reservoir based on the one-time sampling event in 2001 allowing the State Board staff to conduct the following investigations: (1) perform sediment sampling in order to provide supporting evidence as to whether or not this reservoir should be listed as an impaired water body; (2) investigate the possibility that stocked fish are already contaminated with mercury and/or PCBs from other sources prior to entering the reservoir; (3) review and incorporate results from the additional sampling already conducted as well as the historical water quality data (latter attached); and (4) review and incorporate results from the Sanitary Survey currently being conducted by the State Water Contractors.

We appreciate the opportunity to comment on this document. If you have any questions or comments, please feel free to contact me at (925) 454-5016.

Sincerely,

G.F. Duerig
Assistant General Manager

GFD:mdl

cc: Dan Peterson and Jeff Janik, Department of Water Resources
Doug Chun, Alameda County Water District
Laura Young, Santa Clara Valley Water District
Neal Fujita, East Bay Regional Parks District
Terry Erlewine and Laura King Moon, SWC
Dale Myers, Vince Wong, Karla Nemeth, Mary Lim, Gurpal Deol

[2] Maule, A., Gannam, A., Davis, J. 2006. A Survey of Chemical Constituents in National Fish Hatchery Fish Feed. Final Report for Science Support Project 01-FH-05; see http://wfrc.usgs.gov/pubs/reportpdf/fishfoodsurveyfinal.pdf

Zone 7 Water Agency

Sample Station	Sample Location	Sample Date	Depth (m)	Dissolved Mercury		PCBs*		Units
				Concentration	Reporting Limit	Concentration	Reporting Limit	
DV001000	Lake Del Valle Dam	12/18/2000	0.4	ND	0.2	ND	0.1	ug/L
DV001000		2/20/2001	0.4	ND	0.2	ND	0.1	ug/L
DV001000		5/14/2001	0.4	ND	0.2	ND	0.1	ug/L
DV001000		8/13/2001	0.4	ND	0.2	ND	0.1	ug/L
DV001000		12/18/2000	4.0	ND	0.2	ND	0.1	ug/L
DV001000		2/20/2001	4.0	ND	0.2	ND	0.1	ug/L
DV001000		5/14/2001	4.0	ND	0.2	ND	0.1	ug/L
DV001000		8/13/2001	4.0	ND	0.2	ND	0.1	ug/L
SW-AV-TO2	Conservation Pipeline	10/20/2005	NA	ND	0.2	ND	0.1	ug/L

* PCBs = PCB 1016, PCB 1221, PCB 1232, PCB 1242, PCB 1248, PCB 1254, and PCB 1260

CITY OF
CHULA VISTA

DEPARTMENT OF PUBLIC WORKS OPERATIONS

October 19, 2006
File # 0780-85-KY181

By E-Mail and US Mail

State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Attention: Song Her, Clerk to the Board

SUBJECT: COMMENT LETTER – 2006 FEDERAL CWA SECTION 303(D) LIST

Thank you for the opportunity to provide comments on the Proposed 2006 Federal Clean Water Act Section 303(d) List. The City of Chula Vista requests removal of the following water segment-pollutant combination from the proposed 303(d) list:

Region:	9
Type:	R
Name:	Pogi Canyon Creek
Calwater Watershed:	91020000
Pollutant/Stressor:	DDT
Potential Source:	Source Unknown
Estimated Size:	7.8 Miles
Proposed TMDL: Completion	2019

The reasons for the above request are as follows:

1. There appears to be discrepancies between test results obtained from the San Diego Regional Water Quality Control Board and those obtained from the SWAMP website. The reported values for DDT sampling results are not the same, and neither of the data sets is in agreement with the stated rationale for the 303(d) listing.

   While, the values obtained from the San Diego Regional Water Quality Control Board show that the May 15, 2003 sample had a 4,4'–DDT value of 0.002 ug/L, the data from the SWAMP website shows an "nd" value for the same analysis on water from the same sampling event. It is unclear why this discrepancy exists, but it does raise questions about the data.

1800 Maxwell Rd.
Chula Vista, CA 91911
Phone (619) 397-6000

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2. The rationale for adding Poggi Creek to the 303(d) list is that two of three samples had DDT levels above the California Toxic Rule (CTR) limit. Depending on which data set is referenced, it appears that only one or zero of the samples had DDT above the CTR limit.

3. According to both data sets, a related compound also monitored at Poggi Creek, 4,4' –DDE, reportedly did have CTR exceedances in two of the three samples. It is possible that in the proposed 303(d) list, "DDT" was typed instead of "DDE". However, the QA/QC notes for DDE samples in the SWAMP data from the web indicate that the QA/QC status for one of the two samples for which DDE was detected (the April 21, 2003 sample) was "non-compliant with associated QAPP". It does not seem especially reasonable to base a 303(d) listing on such a small data set, particularly when one of the already limited number of analyses does not appear to have met relevant QA/QC standards.

4. Although DDT was used legally in the United States until 1972, its use has been banned ever since. It is not clear how this pollutant, if existing, can be eliminated or minimized in the receiving waters by actions from the responsible jurisdiction or any other party.

Thank you for your consideration of the above. We look forward to the delisting of the above referenced water segment-pollutant combination from the proposed 303(d) list. Should you have any questions or need further information, please call me at (619) 397-6121.

KIRK AMMERMAN
PRINCIPAL CIVIL ENGINEER

K:\Public Works Operations\NPDES\RWQCB Correspondence\2006 303(d) Comment-2 .doc

CITY OF BURBANK
275 EAST OLIVE AVENUE, P.O.BOX 6459, BURBANK, CALIFORNIA 91510-6459
www.ci.burbank.ca.us

PUBLIC WORKS
DEPARTMENT

October 19, 2006

Song Her, Clerk to the Board
State Water Resources Control Board
Executive Office
1001 I Street
Sacramento, CA 95814

SUBJECT: COMMENT LETTER – 2006 FEDERAL CWA SECTION 303(d) LIST

Dear State Water Resources Control Board:

The City of Burbank Public Works Department appreciates the opportunity to comment on the State Water Resources Control Board's (State Board) 303(d) list of impaired waterbodies. The creation of the Listing Policy (Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List) has made the listing process much more transparent and straightforward. We applaud the implementation of the Listing Policy and the hard work by the State Board staff to review data in accordance with it.

Upon reviewing the proposed 2006 Clean Water Act 303(d) list, we are in agreement with all of the listing and delisting decisions made by the State Board as it regards the Burbank Western Channel. The only correction needed on these listing is moving both trash and copper to "List as Being Addressed." TMDLs have been created for both of these pollutants for the Los Angeles River and its tributaries, which includes the Burbank Western Channel. Therefore, the

Thank you for your consideration of our concerns. If you have any questions, please call me at (818) 238-3931.

Sincerely,

Rodney Andersen, P.E.
Assistant Public Works Director – Wastewater Systems

BOARD OF SUPERVISORS
BILL POWERS, DISTRICT 1
ROBERT A. MEACHER, DISTRICT 2
WILLIAM N. DENNISON, DISTRICT 3
ROSE COMSTOCK, DISTRICT 4
OLE OLSEN, DISTRICT 5

October 20, 2006

RECEIVED
OCT 24 2006
EXECUTIVE OFFICE

Tam Doduc, Chair
State Water Resources Control Board
1001 I St.
Sacramento, CA 95814

Subject: **Comment Letter – 2006 Federal CWA Section 303(d) List**

Dear Chair Doduc,

Plumas County (County) hereby provides its comments on the Proposed 2006 Federal Clean Water Act Section 303(d) List of Water Quality Limited Segments for California. Our comments are directed to the proposed 303(d) listing for water temperature impairment for the North Fork Feather River (NFFR) below Lake Almanor. After reviewing the eight lines of evidence and the Water Boards Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (September 2004), we conclude that the 303(d) water temperature listing for the NFFR is ill-advised at this time. Instead, we recommend that the Water Board defer listing and conduct a site-specific analysis of the NFFR to establish appropriate water temperature criteria for listing.

The County's fundamental concern is the use of the 21.0° C (70° F) maximum instantaneous criteria used for the eight lines of evidence. Volume II – Water Body Fact Sheets Supporting the Listing and Delisting Recommendations, page 46 states that "The guideline used was from Sullivan et. al. (2000)." The County has reviewed Sullivan et. al. and notes that this reference concentrates on "the summer rearing life history phase of species within the Salmonidae family that dwell in stream environments, namely juvenile coho salmon and steelhead trout" (Sullivan et. al. 2000, page 1-3). The coldwater species indicator for the NFRR is rainbow trout. The fact sheets assume that steelhead trout are surrogates for rainbow trout. In fact, the steelhead trout life cycle is vastly different from rainbow trout. The Fisheries Handbook of Engineering Requirements and Biological Criteria (U.S. Army Corps of Engineers, 1991) shows that the optimum temperature range for steelhead trout varies from 45 to 58° F, whereas the optimum temperature range for rainbow trout varies from 54 to 66° F (see attachment). This is a significant difference. The Fisheries Handbook indicates that the upper lethal limit for steelhead trout is 75° F (23.9° C), whereas the upper lethal limit for rainbow trout is 85° F (29.4° C). Clearly the temperature criteria developed for steelhead trout cannot be used for rainbow trout.

Numeric Line of Evidence – Pollutant – Water
The County agrees that the temperature measurement data used in this line of evidence is of high quality. However, as stated above, the fundamental underpinning of the 21.0° C maximum instantaneous water temperature is flawed. Further, the discussion on data used does not indicate the degree by which the 21°C threshold was exceeded nor the duration. As discussed in Sullivan et. al. and in the Regional Board's letter commenting on the proposed listing (letter from Mr. Jim Pedri to Mr. Joe Karkoski, TMDL Unit, RWQCB , dated December 1, 2005), these are important factors.

Numeric Line of Evidence – Population/Community Degradation
The County would agree with the statement, "in many cases, fisheries, particularly salmonids, represent the beneficial uses most sensitive to temperature." However, we fail to see the argument being put forth. The data speak to census data collected in 1952, 1953, and 1954. The information included in this line of evidence does not show population or community degradation. A better comparison would be to examine fish populations over a much longer period of time. However, a comparison of this nature is complicated because of other environmental changes that have taken place such as habitat alteration, flow changes, hydro modification or the introduction of non-native species.

Numeric Line of Evidence – Population/Community Degradation
The County concurs that the North Fork Feather River was once considered a trophy fishery. However, multiple factors have undoubtedly affected the fishery. Access to the area was historically limited. With the end of World War II and the construction of the Rock Creek-Cresta Project, access improved and fishing pressure increased. The 31,500 angler days in 1946 and three trout caught per angler day (94,500 trout) may very well have had an effect on the fish population. This is more than twice the number of rainbow fingerlings that were stocked in 1952 and 1953.

We have no doubt that the Rock-Creek Cresta Project also affected the fish populations. That is why the County has worked with Water Board staff, PG&E and other parties during PG&E's relicensing to improve habitat conditions for fish. We suggest that the Water Board continue to work with PG&E to determine the limiting factors and focus efforts on improving the limiting factors rather than using one flawed criterion for decision-making. Temperature may very well be a factor in the ability to improve fish populations, but a more comprehensive approach is needed. Such a comprehensive approach should include identifying temperature duration limits that can affect growth and survival.

This numeric line of evidence states that daily maximum temperatures reached as high as 23.5° C, and that temperatures were even higher under extreme low flows. However, these higher temperatures are not reported. Further increased effects of infectious diseases like C. Shasta are inferred because such diseases perpetuate more rapidly with water temperatures. We agree that this should be evaluated, but no proof that higher water temperatures led to increases in infectious diseases has been put forth in the line of evidence.

The Water Board may wish to consider water temperature criteria established at other projects prior to making a decision on the 303(d) listing. One project worth consideration is the Deep Creek Hydropower Project in western Maryland. It was initially determined by the resource agencies that an instantaneous water temperature of 18 to 22° C would provide optimum conditions. Since the project was completed in the late 1920s, minimum river flows downstream of the project had been as low as about 7 cubic feet per second and instantaneous water temperatures were as high as 30° C. These temperatures were lethal to fish. The fish population was able to sustain itself because some rainbow trout were able to find refuge in tributary mouths where colder water was available. The project owner, resource agencies, and other parties agreed to increase the minimum flow during the state permitting process in the early 1990s. However, even with the higher minimum flow, it was shown that water temperatures could still approach the lethal limit under certain conditions. When it was determined through study that the project (Deep Creek Lake) could not provide enough cold water to maintain the desired water temperatures, the parties agreed that the project owner would need to install and maintain a continuous water temperature monitor at the downstream end of the critical reach and operate the project to maintain an instantaneous maximum of 25° C or less. This protocol has been ongoing since 1994. Simultaneously the Maryland Department of Natural Resources designated this reach of river as "catch and release." This reach of river has now become an outstanding trout fishery. For the most part, the water temperatures are in the preferred range, but during hot dry conditions, the project does operate for water temperature control.

Numeric Line of Evidence – Population/Community Degradation
The County is unclear about the fourth line of evidence. Waters withdrawn from Lake Almanor are taken at depth from either the Prattville intake or the Canyon dam intake. They are not taken from the surface. Coldwater fish species in Lake Almanor do not live at the surface. They live at depths that provide a suitable combination of water temperature and dissolved oxygen. This is precisely the reason that Plumas County is concerned about the coldwater pool in Lake Almanor. Lake Almanor cannot afford to lose its coldwater pool merely to meet an ill-advised water temperature criterion. It is important to protect not only the cold water fishery of the NFFR, but also of Lake Almanor. Therefore the County reiterates its request for the Water Board to establish appropriate maximum water temperatures and associated durations that are protective of the beneficial uses of the NFFR, and not merely adopt an instantaneous maximum developed for steelhead trout in Washington State.

Numeric Line of Evidence – Population/Community Degradation
This line of evidence suggests that the water temperatures in the Poe Reach are not supportive of rainbow trout since only one was caught. PG&E is currently relicensing the Poe Project. It is not clear what the limiting factors are for rainbow trout, although temperature could be. PG&E will likely be required to significantly increase minimum flows. This may have a beneficial impact on water temperatures. Plumas County recommends that the Water Board work with PG&E and other parties to develop numeric water temperature criteria that are protective of rainbow trout.

Numeric Line of Evidence – Population/Community Degradation
We have not reviewed Gerstung (1973) due to the limited amount of time to prepare our response (i.e., 30 days). We do not doubt its validity. However, the culprit for reduced standing crop of trout may be more the result of reduced flows and increased fishing pressures. The settlement agreement for the Upper North Fork Feather River was signed in April 2004. It has provisions for increasing the minimum flows and improving habitat. Regrettably until the Water Board completes the Environmental Impact Report and issues a 401 Water Quality Certification, the Federal Energy Regulatory Commission cannot issue a license. Without a new license there is no requirement for PG&E to increase minimum flows or improve habitat. Until such time, there is no way to determine the effectiveness of the increased flows and habitat on trout populations.

Numeric Line of Evidence – Population/Community Degradation
The County appreciates the 1915 photo of the Maidu Indian woman with her catch of fish. However, it does not provide evidence of water temperatures degrading the trout population.

Numeric Line of Evidence – Population/Community Degradation
Similar to the photo of the Maidu Indian woman, the two 1911 photos of anglers does not provide evidence of water temperatures degrading the trout population. The County acknowledges that the NFFR was historically a trophy rainbow trout fishery. However, we believe that past and even current over-fishing of the NFFR, as well as lack of access for fish to tributary streams could be as important to the demise of the fisheries as the water temperature. It is for those reasons that 2105 LG recommended that obstacles, such as culverts installed by the railroad and CalTrans be investigated and replaced where necessary. In addition, it was recommended that a Game Warden be hired to patrol the NFFR.

The County strongly supports the need to protect the environment and proposes to work with the Water Board to do so. However, a temperature impairment listing on the North Fork could cost millions of dollars annually. It is imperative that before a listing decision is made full consideration be given to all the facts. Based on the overly conservative approach used in the lines of evidence, the County supports the approach espoused by the Regional Water Quality Control Board in their letter of December 1, 2005. The County also supports a risk-based approach as developed in the Sullivan report, but using NFFR rainbow trout temperature requirements. Over the past 10 years, PG&E has collected sufficient information during the relicensing of the Rock Creek/Cresta Projects, Upper North Fork Feather River Project, and Poe Project to develop appropriate coldwater criteria for species protection in the NFFR. Given the importance of the Water Boards decision, the County proposes that the Water Board direct Water Board staff to establish temperature criteria for the NFFR based on existing information and perhaps supplemented with additional information that might be needed. We recommend that the Water Board staff also be directed to work with Regional Board staff and the parties to the Rock Creek Cresta Settlement agreement and the 2105 Committee for the NFFR who have knowledge of the NFFR to develop suitable criteria.

In closing, Plumas County wishes to thank Mr. Craig Wilson and Ms. Dorena Goding for the time they took to explain the 303(d) listing process to the County on October 11, 2006. Their

explanation of the process was enlightening. We appreciate the enormity of the task undertaken by Water Board staff to conduct the listing assessment. Staff should be commended for their hard work. However, in the instance of the temperature listing for the NFFR, more work needs to be done. The County looks forward to working with Water Board staff on this complex issue.

Sincerely,

Bill Dennison

Bill Dennison,
Plumas County Supervisor, District 3

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United States Department of the Interior
California Department of Parks and Recreation

Redwood National and State Parks
1111 Second Street
Crescent City, California 95531

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October 19, 2006

Tam M. Doduc
Board Chair
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Subject: Comment Letter – 2006 Federal CWA Section 303(d) List

Dear Ms. Doduc:

Thank you for the opportunity to comment on the 2006 Federal Clean Water Act (CWA) Section 303(d) List. We encourage the State Water Resources Control Board (SWRCB) to list the Lower Klamath HA, excluding waterbodies within Tribal boundaries, as water quality limited due to sedimentation/siltation. Redwood National and State Parks (RNSP) encompasses 35 miles of coastline including the mouth of the Klamath River. The Klamath River plays a significant role in the condition of the coastal marine resources within the jurisdiction of RNSP, as well as in region-wide fisheries and ecological issues.

Evidence submitted by the North Coast Regional Water Quality Control Board (NCRWQCB) to the SWRCB supports a 303(d) listing for sedimentation/siltation in the Lower Klamath HA, including certain tributary watersheds. The SWRCB cited the following reason for not listing the Lower Klamath HA as impaired due to sedimentation/siltation: "The decision to not list is based on the staff findings that the sampling locations for this data were on tribal lands and the State lacks Clean Water Act jurisdiction to list waters on tribal lands."

We understand that the State lacks CWA jurisdiction to list waters on tribal lands. However, we believe the State is obligated to use the best available data and information, even if it is gathered from tribal land, as a basis to list hydrologically connected tributary watersheds beyond tribal boundaries. In previous 303(d) lists, the SWRCB listed complete hydrologic areas or subareas in accordance with watershed boundaries rather than specific stream reaches. This approach is consistent with CWA responsibilities because sedimentation delivered from tributary watersheds contributes cumulatively to the degradation of mainstem conditions.

The SWRCB has designated the RNSP coastline as an Area of Special Biological Significance (ASBS), also known as State Water Quality Protection Area. The National Park Service has cooperated with several other agencies and organizations to support studies to characterize the rich and unique biological community and physical conditions in the marine environment along the RNSP coastline. These studies highlight the importance of the volume and quality of freshwater discharge from the Klamath River on coastal marine resources. The restoration and protection of the Klamath River and other coastal watersheds is critical to the health of the ASBS. Properly listing water-quality limited waterbodies is a necessary step in the recovery process.

We encourage the SWRCB to list the Lower Klamath HA beyond tribal boundaries for sedimentation/siltation, then develop TMDLs and implement the measures necessary to protect beneficial uses in the Klamath River and adjacent coastline.

If you have any questions or need any other information you may contact Chris Heppe at 707-465-7704.

Sincerely,

Terrence D. Hofstra, Chief
Division of Resource Management and Science

Cc: Craig Wilson, State Water Resources Control Board
Bruce Gwynn, North Coast Regional Water Quality Control Board
David Smith, US Environmental Protection Agency

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

OCT 19 2006

Tam Doduc, Chair
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

Dear Chairwoman Doduc:

Thank you for the opportunity to comment on California's proposed final 2004-2006 Clean Water Act Section 303(d) list. We carefully reviewed the proposed final listing decisions and supporting documentation and we have concluded that 99% of the State's assessment determinations are consistent with federal listing requirements. We identified 10 additional water body-pollutant combinations that appear to meet federal listing requirements and urge the State Board to include these combinations on the final list (see Table 1, below). We also identified 9 water body-pollutant combinations that do not need to be listed and should be removed from the final list (see Table 2). In several other cases, we could not determine from the decision documents the specific basis for the State's assessment determinations and will need to further review the State's decision rationales upon receipt of the final submittal. Finally, as the State is already working on the 2008 assessment, we include several recommendations to improve the assessment approach used to develop the 2004-2006 list. This letter summarizes our review of individual assessments and overall process concerns; Enclosure 1 describes our review of individual assessment decisions.

I. Overview

As the State's Section 303(d) list submission is long overdue, we urge the State Board to adopt its final 2004-2006 list without further delay. After we receive your final submittal package, we will review the assessment documentation and, if necessary, supporting data and information in the State's administrative record to determine whether the final list meets federal listing requirements. EPA believes the State's highest priority at this point should be to complete its work on the 2004-2006 list now and focus upon development of the 2008 Integrated Report containing Section 303(d) list and Section 305(b) report information.

EPA commends the State for its considerable effort to respond to public comments and evaluate recently submitted data and information. We support the State's decision to list several waters for invasive species in the Central Valley and North Coast Regions and two Central Valley waters for temperature. We also support the decisions concerning the following waters and pollutants as recommended in EPA's comments on the draft list:

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- list Laguna de Santa Rosa for nitrogen and phosphorus,
- delist Lower Lost River for temperature,
- list several Dominguez Channel/Los Angeles Harbor segments for toxic pollutants,
- delist Santa Monica Bay for chlordane,
- delist San Gabriel River Reach 3 for toxicity, and
- list Anaheim Bay for dieldrin.

We continue to support the State's decision to delist waters for which no data or information could be found to support prior listings or the listings were determined to be invalid based on reassessment of available data and information.

Consistent with the Listing Policy, the State's Section 303(d) list includes a subcategory of impaired waters with completed TMDLs (Water Quality Limited Segments Being Addressed). We note that based on its assessments of some waters for which TMDLs have been completed, staff concluded that several of these waters are no longer impaired. Although EPA disagrees with several of these assessments, we would not disapprove the State's decision not to list them as federal listing guidance indicates States are not required to include on the Section 303(d) list impaired waters for which TMDLs have been completed. Our comments, therefore, do not focus on these water body assessments.

II. Additional Listing Recommendations

Our review of the listing record indicates several waters not proposed for listing may exceed the applicable water quality standards. We urge the State to consider listing the waters identified in Table 1. The following sections discuss the basis for these recommendations.

Table 1: Additional Listing Candidates

Reg. Bd.	Water Body	Pollutant
3	Chumash Creek	dissolved oxygen
4	Consolidated Slip	benzo[a]anthracene
	Los Angeles/Long Beach-Inner Harbor	copper zinc
	Los Angeles/Long Beach-Fish Harbor	benzo[a]pyrene
	Los Angeles/Long Beach-Outer Harbor	sediment toxicity
	San Buenaventura Beach	coliform bacteria
5	Feather River- N. Fork below L. Almanor	copper
7	New River (Imperial)	copper
9	Loveland Reservoir	pH

A. Toxic Pollutant Assessments

The California Toxics Rule (CTR) contains numeric water quality standards for toxic pollutants that are applicable to most California waters. The CTR provides that toxic pollutant criteria are not to be exceeded more than once in three years on average. Assessment decisions for toxic pollutants must be consistent with this allowable exceedance frequency. We also recommend consideration of the magnitude of excursions and excursion frequency to assess water quality standards compliance. The State's application of a binomial statistical method to

assess attainment of water quality standards for toxicants appears inconsistent with this CTR provision and has resulted in omission of several waters that should be listed for toxic pollutants. For example, N. F. Feather River and New River appear to exceed CTR standards for copper.

B. Conventional Pollutant Assessments

Listing assessments of conventional pollutants such as dissolved oxygen (DO), pH, and bacterial indicators must be consistent with the provisions of applicable water quality objectives in each Basin Plan. For example, Regional Basin Plan standards for dissolved oxygen typically provide that minimum values are "not to be exceeded at any time" or should be evaluated based on the 85th or 90th percentile. Several Basin Plans provide that bacterial indicator objectives may not be exceeded in more than 10% of available samples. The Listing Policy's binomial statistical approach applies a 25% allowable exceedance rate for conventional pollutants that appears inconsistent with many applicable objectives. We recommend direct application of allowable exceedance rates specified in Basin Plans. In cases where the Basin Plans do not specify allowable exceedance frequencies for conventional pollutants, we recommend direct application of a 10% exceedance rate for conventional pollutants, as described in EPA guidance (EPA, 2002; EPA 1997). Several additional waters (e.g., Chumash Creek for DO, Loveland Reservoir for pH, and Mission Bay for coliform bacteria) should be evaluated for listing based on these considerations.

C. Sediment Chemistry and Toxicity Assessments

The Listing Policy states that sediment chemistry shall be used as a basis for listing if supported by evidence of related sediment toxicity or benthic community impacts. In some cases (e.g., Los Angeles/Long Beach Harbor and Consolidated Slip), waters were not listed although available data showed evidence of elevated sediment chemistry levels for individual pollutants and either sediment toxicity or benthic community impacts. These assessments may support listings of these waters and pollutants.

III. Additional Delisting Recommendations

Our review of the assessments of two waters in the Los Angeles Region found that some pollutants are proposed for listing that do not exceed water quality standards for the pollutants in question (see Table 2). In the case of the freshwater portion of Dominguez Channel, the proposed listings for several toxicants were based on samples collected at saltwater sites downstream from this segment that are unrepresentative of the freshwater segment. In the case of Walnut Creek toxicity, recent toxicity sampling results found no toxicity in Walnut Creek (a tributary to San Gabriel River). We have attached the draft sampling report to this letter (see Enclosure 2). As EPA is working with the Regional Board to complete TMDLs both for toxicants in the Dominguez Channel area and for toxicity in San Gabriel River watershed, we believe the Section 303(d) listings should accurately reflect the actual causes of impairment based on the most representative available data sets.

Table 2: Additional Delisting Candidates

Reg. Bd.	Water Body	Pollutant
4	Dominguez Channel (above Vermont Ave)	aldrin Chem A chlordane DDT dieldrin PCBs chromium PAHs
	Walnut Creek	toxicity

IV. Waters For Which the Decision Rationale Was Unclear

We appreciate your staff's efforts to work with us to explain unclear assessment decisions. However, analysis provided in the listing record and by your staff was insufficiently clear for EPA to determine whether several waters and pollutants meet federal listing requirements. We urge the State to clarify the basis for its assessment that the waters in Table 3 should not be included on the final list.

Table 3. Waters For Which Decisions Are Unclear

Reg. Bd.	Water Body	Pollutant
1	Klamath River	sediment
	Dutch Bill Creek	dissolved oxygen phosphate
	Lancel Creek	dissolved oxygen
	Pocket Creek	dissolved oxygen phosphate
	Austin Creek	phosphate
	Big Sulfur Creek	phosphate
	Santa Rosa Creek	phosphate
	Russian River	phosphate
	Usal Creek	temperature
	Winchuck River	sediment
	Humboldt Bay	dioxin
2	Stege Marsh	toxicity
3	San Luis Obispo Creek	nutrients
4	Ormond Beach	coliform bacteria
	Malibu Creek	invasive species
9	Mission Bay	pathogens

A. Nutrient Effects Assessments

For many waters, the State declined to apply narrative biostimulation objectives to assess waters for nutrient-related impairments due to an apparent concern that available assessment criteria are not fully reliable (e.g., Russian River and several tributaries for phosphate). The State is required to evaluate potential violations of the narrative objectives (40 CFR 130.7(b)(3)).

The State conducted this assessment to support its listing of Laguna de Santa Rosa and other waters for nitrogen and/or phosphorous and should do so for other waters for which nutrient data are available.

B. Klamath River and Tributary Sediment Assessments

When the State previously proposed to list Klamath River for sediment, EPA commented that the State should clarify that its listing did not apply to waters in Indian Country as the State lacks jurisdictional authority over those waters. In response, the State proposed not to list any segments of Klamath River or its tributaries for sediment. The fact sheet prepared for Klamath River sediment indicates several lines of data and information were provided to support potential sediment listings of Klamath River and several tributary Creeks. The data and information in the State's records (potentially including data collected by the Yurok tribe near its tribal boundaries and comments submitted during the comment period) may support sediment listings of Klamath River and/or its tributaries upstream from Indian Country. The State must clarify how it considered the available data and information and, if warranted, list portions of Klamath River and/or its tributaries for sediment outside tribal boundaries.

C. Evaluation of Data and Information Submitted by Commenters

We appreciate staff's hard work to consider data and information submitted by public commenters. In most cases, it appears staff did a good job of considering public comments. However, for some waters, we could not determine from the responsiveness summary or fact sheets how staff considered information submitted during the comment period (e.g., information regarding Klamath River sediment, Humboldt Bay dioxin, Malibu Creek invasive species, and several beaches addressed in Heal the Bay's comments). Please clarify how the State considered the data and information submitted for these waters in your final decision and submittal.

V. Assessment Process Concerns

To develop the Section 303(d) list, staff applied the Listing Policy adopted in September 2004. In our comments on the Listing Policy and draft 2004-2006 Section 303(d) list, EPA expressed concern the Policy would be applied in a manner inconsistent with federal listing requirements and applicable water quality standards. Briefly, these concerns involve:

- application of "weight of evidence" analysis procedures
- listing thresholds used for toxic, bacterial and some conventional pollutants that are inconsistent with applicable water quality standards,
- minimum sample size requirements,
- interpretation of narrative water quality standards, and
- documentation prepared to support decisions.

A. Weight of Evidence Assessment

The Listing Policy includes provisions that require the State to conduct a weight of evidence analysis of different lines of evidence that may collectively indicate water quality impairment even when single lines of evidence do not indicate impairment (see Section 3.11).

During the development of the Listing Policy, EPA and other commenters were assured that these provisions would be implemented in accordance with this principle and that the analysis of single lines of evidence is a "first step" in the analysis (Listing Policy Responsiveness Summary, p. B-20). We are concerned that staff now appear to take the position that the "weight of evidence" provisions can be applied to evaluate only those lines of evidence that were not evaluated through other assessment provisions in the Policy (303(d) List Response to Comments, p. 11). This is inconsistent with the plain language of the Listing Policy, which states "When all other Listing Factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that a water quality standard is not attained." (Section 3.11).

Moreover, as the staff interpretation would enable the State to avoid considering lines of evidence that are existing and readily available, the interpretation is inconsistent with the federal requirement that States consider all existing and readily available data and information in the assessment process (40 CFR 130.7(b)). This interpretation would also enable staff to rely upon decision rules contained in the Listing Policy that are inconsistent with the provisions of applicable water quality standards concerning the allowable duration and frequency of excursions (e.g., for toxic pollutants covered under the California Toxics Rule). Finally, the staff interpretation would enable the State to avoid assessing attributes of data and information that the other listing factors do not consider (e.g., magnitude, duration, and timing of water quality objective excursions and synergistic effects of related pollutants that could indicate nonattainment of standards). The State Board should direct staff to apply the Policy's "weight of evidence" provisions not as a rare exception but as a regular practice to ensure all evidence is fully and carefully considered in the assessment process.

B. Review Thresholds Inconsistent with Water Quality Standards

As discussed in sections II.A. and II.B. above, staff relied improperly on the Listing Policy's binomial decision rules to assess compliance with numeric water quality standards in Basin Plans and the CTR. The binomial decision rules set the allowable exceedance frequencies at levels less stringent than provided in the applicable water quality standards. As a result, several waters that exceed the numeric standards are not included on the final list. While the binomial decision rules may be used reasonably as screening tools, the State Board should direct staff not to rely solely on these erroneous decision rules to make final listing determinations in the next listing cycle.

C. Improper Use of Minimum Sample Size Requirements

For several waters and pollutants, staff apparently did not consider listings because available data sets did not meet minimum sample size expectations set in the Listing Policy. Several of the minimum sample sizes are inconsistent with the provisions of applicable Basin Plan and California Toxics Rule water quality standards. While use of minimum sample sizes may be used as a screening tool, final assessments should not be limited in the next listing cycle by minimum sample sizes unless specified in the applicable water quality standards.

D. Application of Narrative Water Quality Objectives

As discussed in Section IV.A above, staff declined to apply narrative water quality objectives in assessing some waters and pollutants for which numeric water quality standards are not in place. For the next listing cycle, all narrative objectives should be applied in the assessment process.

E. Decision Record Is Convoluted and Excessively Large

We recommend that the State reconsider how to document its assessment determinations. We and many other commenters found it extremely difficult to determine the basis for staff's assessment determinations based on review of the voluminous record provided to support the proposed list. First, individual fact sheets often do not clearly explain the data and information considered and specific basis for the assessment determination. Second, the fact sheets and other material were organized in several documents in a convoluted manner. Third, the overall size of the record (4945 pages) made it difficult to carefully review the basis for individual decisions. The State should review how other states organize their Section 303(d) list and Integrated Report documentation and consider revising its approach to documenting its decisions. For example, the State of Arizona organized its most recent Integrated Report documentation in an easy-to-follow tabular form by watershed, which enabled the State to capture its entire Section 303(d) and 305(b) reporting decision in one 331 page document.

During our review of the final State list submittal, it is possible we may identify additional waters that meet federal listing requirements or that require additional explanation of the State's decision. We will discuss these waters with your management team if identified. We would be happy to discuss our comments at your convenience and look forward to receiving the 2004-2006 Section 303(d) listing decision in the near future. If you have any questions, please call me at (415) 972-3572 or David Smith at (415) 972-3416.

Sincerely yours,

Alexis Strauss

Alexis Strauss 18 October 2006
Director, Water Division

Enclosures:
1. Specific comments on proposed final 2004-2006 California Section 303(d) list
2. "Wet and Dry Weather Toxicity in the San Gabriel River"

Enclosure 1: Specific comments on proposed final 2004-2006 California Section 303(d) list

Table 1: Candidates for Inclusion on the Section 303(d) List				
RB	**Proposed assessment**	**Waterbody name**	**Pollutant**	**Comment & Recommendation**
3	Delist	Chumash Ck	DO	Available data indicate Basin Plan numeric WQO for DO is violated in greater than 10% of samples (40/245). State should retain listing this waterbody for this pollutant.
4	Do Not List	Consolidated Slip	Benzo[a]-anthracene	Assessment record is incomplete. Fact sheet shows evidence of sediment toxicity and sediment chemistry exceedences for this compound (15/53 samples). This is sufficient evidence of impairment based on narrative WQOs. State should include this pollutant on list for this segment.
4	Do Not List	LA/LB Harbor—Inner Harbor	Cu Zn	Assessment record shows sediment quality exceedences for Cu (18/627) and Zn (35/716) samples (CSTF database). There is also evidence of sediment toxicity and benthic community effects for this waterbody. These are multiple lines of evidence of impairment based on narrative WQOs. State should include pollutants on list for this segment.
4	Do Not List	LA Harbor—Fish Harbor	Benzo[a]-pyrene	Assessment record is incomplete. Fact Sheet shows evidence of sediment toxicity and sediment chemistry exceedences for this compound (11/13 samples). This is sufficient evidence of impairment based on narrative WQOs. State should include this pollutant on list for this segment.
4	Do Not List	LA/LB Outer Harbor	Sediment toxicity	Available data show sediment toxicity exists in this waterbody. (9/37 samples are moderately or highly toxic). This is sufficient evidence of impairment based on narrative WQOs. State should include this pollutant on list for this segment.
4	Do Not List	San Buenaventura Beach	coliform bacteria	Fact Sheet indicates WQOs violated in more than 10% of samples (44/401 samples). State should retain on list based on exceedences of numeric WQS.
5	Do Not List	Feather River – North Fork (below Lake Almanor)	Cu	Available data indicate numeric CTR standards are violated for Cu (10/124) samples. State should list pollutant for this segment.

Table 1: Candidates for Inclusion on the Section 303(d) List				
RB	**Proposed assessment**	**Waterbody name**	**Pollutant**	**Comment & Recommendation**
7	Do Not List	New River (Imperial)	Cu	Available data indicate numeric WQO violations for Cu (10/24) samples. State should list pollutant for this segment.
9	Do Not List	Loveland Reservoir	pH	Available data indicate greater than 10% exceedences of Basin Plan numeric WQO for pH (35/212) samples. State should list pollutant for this segment.

Table 2: Candidates for Exclusion from the Section 303(d) List				
RB	**Proposed assessment**	**Waterbody name**	**Pollutant**	**Comment & Recommendation**
4	List	Dominguez Channel freshwater (lined portion above Vermont Ave.)	Aldrin, Chem A, Chlordane, DDT, Dieldrin, PCBs	In the 2005 draft fact sheets, State provided evidence that the fish tissue sample (TSMP, 1992) was collected at downstream site in estuary portion, not in freshwater area (above Vermont Ave). EPA has confirmed this using lat/long data for sample site (405.12.04). Also, the freshwater stream flow is solely downstream, so there is neither flow nor pollutant transfer from downstream estuarine waters up into the upstream, freshwater segment (lined portion). State should delist these six pollutants for this waterbody.
4	List	Dominguez Channel freshwater (lined portion above Vermont Ave.)	Cr PAHs	Fact sheet states there are sediment exceedences for these two pollutants however there are no sediment results in this freshwater segment. Existing water column data does not show exceedences for these two pollutants (LACDPW). State should delist these two pollutants for this waterbody.
4	List	Walnut Creek	toxicity	Thorough examination of available data including new toxicity results (SCCWRP 2006, see enclosure 2) show no impairment in this segment. This segment should be delisted.

Table 3: Basis for assessment decision is unclear				
RB	**Proposed assessment**	**Waterbody name**	**Pollutant**	**Comment & Recommendation**
1	Do not list	Klamath River/ Streams tributary to Lower Klamath River	sediment	EPA concurs with the decision not to list portions of the Klamath River located in Indian Country for sediment as the State lacks jurisdictional authority to list waters in Indian Country. However, the fact sheet prepared to support the Klamath River sediment is unclear as to staff's assessment of whether data and information in the record are sufficient to support listing portions of the Klamath River and/or it's tributaries that are not located in Indian Country. The fact sheet(s) indicate some lines of evidence of sediment impairment in these waters. Please clarify the technical basis for the decision to not include on the list for sediment either Klamath River segments or tributary waterbody segments located outside tribal boundaries.
1	Do Not List	Winchuck River	sediment	Fact sheet indicates some lines of evidence of sediment impairment in this waterbody. Please clarify the technical basis for the decision to not include this segment on the list.
1	Do Not List	Tributaries to Russian River- Dutch Bill Creek, Lancel Creek, Pocket Creek	dissolved oxygen	Available data indicate greater than 10% of samples collected in these creeks exceeded the Basin Plan's minimum D.O. objective, which is not to be exceeded "at any time". State has not provided clear information establishing sufficient rationale for not listing these waters.
1	Do Not List	Dutch Bill Creek, Pocket Creek, Austin Creek, Big Sulfur Creek, Santa Rosa Creek, Russian River	phosphate	It is unclear from the fact sheets how the State considered available data for phosphate and/or ortho-phosphate results. State needs to identify numeric guideline for this pollutant and apply it for assessment decisions for these waters (and possibly others in California). State has not provided clear information establishing sufficient rationale for not listing these waters.
1	Do Not List	Usal Creek	Temperature	It is unclear from the fact sheet how the State considered available temperature results for this waterbody.
1	Do Not List	Humboldt Bay	dioxin	It was unclear from the fact sheets and responsiveness summary how the State considered data submitted by Humboldt Baykeeper comments which the commenter alleges is sufficient to support a

Table 3: Basis for assessment decision is unclear				
RB	**Proposed assessment**	**Waterbody name**	**Pollutant**	**Comment & Recommendation**
				dioxin listing of Humboldt Bay. Please clarify how the State evaluated the data submitted for Humboldt Bay.
2	Do Not List	Stege Marsh	toxicity	Available data appear to indicate substantial amphipod toxicity in this waterbody and the presence of several toxicants that may cause or contribute to the observed toxicity. Please provide a clearer rationale for the decision not to list for toxicity. In addition, fact sheet refers to planned remedial action. If the State is asserting that required controls on pollutant sources in Stege Marsh are expected to result in attainment of applicable toxicity standards, please provide more information to support a conclusion that these controls will be sufficient to ensure attainment of the applicable standards.
3	Delist	San Luis Obispo Creek	Nutrients	State has placed this waterbody in Being Addressed Category; however the nutrient TMDL has not been approved. EPA's review of existing draft TMDL indicates significant revision is required prior to approval. State should retain this waterbody-pollutant combination on impaired waters list until nutrient TMDL has been approved.
4	Delist	Consolidated Slip	Dieldrin	Fact sheet states the original listing was based on tissue MTRL values and sediment EDL values however staff's assessment did not make to OEHHA values or sediment guidelines identified with Listing Policy. State should retain this segment on list or provide good cause for delisting.
4	Delist	Ormond Beach	Coliform bacteria	Available data show numeric WQOs violated in greater than 10% of results (33/279 samples). Fact sheet indicates even higher exceedence rates at certain monitoring stations. It is unclear from the fact sheets if staff's analysis of 1999-2001 data record included examination of individual pathogen results (i.e, enterococcii, fecal, or total coliform data). State must provide good cause for delisting or should retain on list for exceedences of bacterial indicators.

Table 3: Basis for assessment decision is unclear				
RB	**Proposed assessment**	**Waterbody name**	**Pollutant**	**Comment & Recommendation**
9	Delist	Mission Bay shoreline	Pathogens	Available data indicate greater than 10% exceedances of Basin Plan Bacteria WQOs (2016 of 17,847 samples for all pathogen results). It is unclear from the fact sheets and responsiveness summary if staff's analysis of 2001-2003 data record included examination of individual pathogen results (i.e, enterococcii, fecal, and total coliform data). Also unclear if state performed an evaluation of data for geomean exceedences. State should retain on list for bacterial indicators based on exceedences of numeric WQOs.

WET AND DRY WEATHER TOXICITY IN THE SAN GABRIEL RIVER

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DRAFT October 5, 2006

INTRODUCTION

Urban watersheds receive a multitude of potential pollutants that can affect aquatic life (Bay et al. 1996, Ackerman et al. 2005, Tiefenthaler and Stein 2005). The San Gabriel River, located on the border between Los Angeles and Orange Counties in southern California, is an ideal example of the ways in which aquatic life may be impacted by potential pollutants. Sources of potential pollutants include treated sanitary wastewaters from five Water Reclamation Plants (WRPs) and untreated urban runoff from approximately 350 km^2 of developed land discharged into the river via a municipal separate storm sewer system, as well as once-through cooling waters from two power generating stations that is mixed with low volume industrial and sanitary wastes then discharged into the watershed's estuary.

To complicate the fate and transport of anthropogenic pollutants and their resultant effects on aquatic life, the hydrology of many urban watersheds is often highly modified. For example, three major dams were constructed in the upper undeveloped reaches of the San Gabriel River watershed in order to capture, retain, and utilize wet season runoff for potable water use during the dry season. While this provides much needed water for the citizens of Los Angeles, the upper watershed is now hydrologically disconnected from the urbanized lower watershed. The result is that natural waters are unavailable for mixing and dispersion when anthropogenic sources discharge to the river downstream. Even greater hydromodification exists in the urbanized lower San Gabriel River watershed. Many miles of the river in this portion of the watershed are lined with concrete in an effort to reduce flooding and property damage, but this modification also results in the maximum exposure of pollutants to aquatic life through the loss of natural stream and treatment processes. Where unlined channels exist in the lower watershed, temporary dams are inflated to enhance groundwater recharge.

In response to pollutant inputs and hydrologic modification, many urban watersheds have been the focus of water quality regulatory efforts. Urban Los Angeles once again provides a good example. More than 180 waterbodies in the Los Angeles region have been placed on the United States Environmental Protection Agency's (EPA's) list of impaired waters. This list, also referred to as the 303(d) list (referring to section 303d of the Clean Water Act), identifies locations impacted by specific pollutants that can result in toxicity to aquatic life and other impacts. The effect of the 303(d) list is the mandate for future regulation (termed a total maximum daily load or TMDL), which will require the mitigation of these pollutant inputs.

In the San Gabriel River watershed, managers have been implementing mitigation to negate the effects of these pollutant inputs. Over the past 10 years, WRPs in the San Gabriel River watershed have installed additional treatment processes, costing over $40 million, that have improved the water quality of their discharges. By contrast, little mitigation in terms of structural controls has occurred within the San Gabriel River watershed. Approximately $__ has been spent on structural best management practices to control pollutant inputs from urban runoff.

The objective of this study was to evaluate the impact of pollutants on aquatic life in the highly urban lower watershed of the San Gabriel River. Impact to aquatic life was assessed through the use of toxicity testing. Four specific goals were identified: 1) assess the magnitude of toxicity at selected locations throughout the San Gabriel River watershed; 2) determine whether or not this magnitude changes seasonally; 3) if toxicity exists, identify the responsible toxicants; and 4) compare the magnitude of toxicity in this study to studies conducted historically in the San Gabriel River watershed to evaluate the effectiveness of watershed management actions.

MATERIAL AND METHODS

Toxicity in the San Gabriel River watershed was evaluated by separating the study into wet weather and dry weather components (Figure 1). The wet weather component consisted of four sampling sites located at the downstream end of major reaches that receive urban runoff. Twenty-liter flow weighted composites were sampled during three storm events on December 29, 2004 (5.3 cm precipitation), April 22, 2005 (2.2 cm precipitation), and January 1, 2006 (3.7 cm precipitation). The dry weather component consisted of sampling a total of 10 sites that included the same four sites sampled during wet weather, plus an additional six sites strategically located in the immediate vicinity of WRP discharges or urban runoff inputs. Dry weather samples were collected at least three days after rain events. Twenty-liter samples were collected from each site during dry weather on a monthly basis from March 2005 to February 2006. Within seven months of this study's initiation, an additional six sites were added for dry weather sampling, all in a single tributary (North Coyote Creek), as a result of observed toxicity. All sites from the Coyote Creek subwatershed, including the additional sites in North Coyote Creek, were sampled until August 2006.

All samples were tested for toxicity using *Ceriodaphnia dubia* examining both acute (lethality) and chronic (reproductive success) endpoints. Testing was initiated within 36 hours of sample collection using undiluted sample and a negative control following standard EPA protocols (EPA 2003a;Table 1). Test organisms were obtained from in-house brood cultures and test duration/exposure lasted until 60% of the surviving females in the control had released three broods (typically between six and seven days). Test solutions were renewed daily.

Toxicity was defined as a 25%, or greater, organism response in the sample exposure relative to control organism response (i.e., <75% survival or reproduction in the 100% sample exposure). In addition, hypothesis testing was conducted following EPA guidelines (EPA 2003a). Hypothesis testing consisted of the nonparametric Fisher's Exact Test for the survival endpoint and an analysis of variance (ANOVA) followed by a multiple comparison procedure for the reproduction endpoint. The parametric Dunnet's Test was used to identify statistically significant differences from the control for reproduction data that were normally distributed with homogeneous variances. The nonparametric Steel's Many-One Test was employed when the data failed normal distribution or equality of variance assumptions.

If a sample was defined as toxic, a toxicity identification evaluation (TIE) was initiated (EPA 1991, 1993b). TIE testing used the remaining sample, stored at 4° C, within seven days of baseline test conclusion. For those samples in which only the reproductive endpoint elicited a toxic response, only 100% and control concentrations were evaluated in the TIE. In these cases, the TIE consisted of a full seven-day chronic test with each sample manipulation consisting of 10 replicates, with daily renewals. For those samples where the survival endpoint elicited a toxic response, three dilutions (25%, 50%, 100%) and a control were evaluated using four replicates containing five test organisms each. In the case of a TIE in response to survival, the exposure duration was 96 hours, with renewal after 48 hours.

The TIE manipulations focused on both characterization and identification phases (EPA 1991, 1993b). These manipulations included: 1) pH adjustment; 2) aeration; 3) Ethylenedinitrilo-

Tetraacetic Acid (EDTA); 4) Sodium thiosulfate (STS); 5) filtration; 6) piperonyl butoxide (PBO); 7) anion exchange column; 8) solid phase extraction (SPE); 9) SPE elution; and 10) no manipulation. By conducting each of these manipulations, the results, alone or in combination, can help to identify the responsible toxicant(s) (Table 2).

All quality assurance/quality control criteria were met for this study. These criteria included all of the test acceptability criteria (Table 1). In addition, positive control samples using reference toxicants (copper chloride) confirmed the relative sensitivity and stability of test organisms during the course of the study.

RESULTS

Wet Weather

None of the storms sampled during this study were acutely or chronically toxic to *Ceriodaphnia*. At all four sites, during all three storms, survival and reproduction were greater than 75% relative to controls.

Dry Weather

Eighteen of 194 (9%) total dry weather samples exhibited chronic toxicity during this study (Table 3). Twelve of 194 (6%) total dry weather samples exhibited acute toxicity during this study . All of the dry weather samples that exhibited chronic toxicity also exhibited acute toxicity. In only one case was statistically significant toxicity observed when the response was less than 25% relative to controls (Station 15, Jan 2006). Only once was toxicity greater than 25% relative to controls and not statistically significant (Station 15, Mar 2006).

All observed toxicity during this study was from Coyote Creek (Table 3). No toxicity was observed in Walnut Creek, San Jose Creek, or San Gabriel River Reaches 1 or 3. Widespread toxicity in Coyote Creek was observed in April 2005. As a result, an additional six stations upstream were added between July and October 2005. Widespread toxicity was observed again in August 2005. Widespread toxicity was not observed again for the remaining 12 months (September 2005 to August 2006).

In the two events for which widespread toxicity was observed in Coyote Creek (April and August 2005), the toxicity appeared to originate in the upper portions of the tributary (Figure 2). In April 2005, 100% reproductive impairment was observed at the site sampled furthest upstream (site 10) and reproductive success remained minimal moving downstream. *Ceriodaphnia* survival was also severely impacted at the furthest upstream station, then survival slowly increased downstream of the WRP discharge (Sites 7 and 6) indicating a potential dilution effect from the WRP effluent. In August 2005, severe reproductive impairment was again observed at the site sampled furthest upstream (site 14) and reproductive success remained minimal moving downstream. *Ceriodaphnia* survival was more sporadic moving downstream during this event. Seventy eight percent survival was measured at site 14 and decreased to 0% survival for downstream Sites 13 and 12. Survival increased to 100% at site 11, but fell back to 0% survival

for the remaining seven miles of Coyote Creek. The sudden increase in survival at Site 11 remains unexplained.

Dry Weather TIE Testing

Seven TIEs were initiated during the study on dry weather samples exhibiting a 25% or greater effect (Table 4). Toxicity was no longer present for three of the samples (sites 9 and 10 March 2005, site 15 March 2006);consequently, no toxicant was identified.

Organophosphorus pesticides, most likely diazinon, were identified as the causative agent in one sample (site 9 April 2005). This result was based on the exclusive removal of toxicity using SPE and the addition of PBO, which removes non-polar organic toxicants and inhibits toxicity due to diazinon, respectively (Figure 3). The SPE was sequentially eluted and these fractions were subsequently tested. Toxicity was recovered in the 80% methanol elution of the SPE column, a fraction associated with many organophosphorus pesticides including diazinon (Figure 4). Finally, 1,700 µg/L diazinon was quantified in the sample using Enzyme-Linked Immuno-Sorbant Assay (ELISA) techniques.

A non-polar organic toxicant(s), possibly a surfactant(s), was identified as the causative agent in the remaining three samples (site 10 April, June, and August 2005). This result was based on the removal of toxicity using SPE. Toxicity was recovered in the 75% methanol elution, a fraction commonly associated with organophosphorus pesticides with surfactant toxicity recovery also documented (Norberg-King et al. 2005). An anion exchange column was used on two samples, with complete removal of toxicity observed in one sample (June 2005) and partial removal in the other (August 2005). This may be indicative of anionic surfactants, but might also suggest the presence of some trace metals. Elution of the anion column would help to confirm anionic surfactant toxicity, but attempts to recover toxicity from the anion column were not successful. However, other treatments to identify trace metals did not reduce toxicity (i.e., EDTA), which helps to rule-out metals as a major source of toxicity. Aeration partially removed toxicity in the April 2005 sample. Some surfactants can be removed or partially removed through aeration. Finally, PBO did not reduce toxicity, and levels of diazinon in these three samples were low (<100 µg/L).

DISCUSSION

Toxicity was not widespread in the San Gabriel River watershed over the 18 months examined during this study. No toxicity was observed at any site during any of the storm events sampled. Similarly, no toxicity was observed in four of the five major reaches in the lower watershed during dry weather. In Coyote Creek where toxicity was observed, the toxicity was intermittent, and occurred only during six of the 18 sampling periods. This was despite an adaptive monitoring strategy, in which the number of sites sampled in Coyote Creek was doubled and the sampling period was extended by six months.

The lack of toxicity observed in this study was in direct contrast to historical studies in this watershed. While 9% of the samples were toxic in 2005/06, 55% of the samples collected for a

similar study in 1992/93 were toxic (UC Davis 1995). Moreover, toxicity was observed in only a single reach (Coyote Creek) in 2005/06, while UC Davis (1995) identified toxicity in all five major reaches in the lower San Gabriel River watershed.

The difference in toxicity from tests conducted 14 years ago is likely due to changes in water quality. UC Davis (1995) concluded that toxicity in the San Gabriel River watershed was likely due to non-polar organics and possibly ammonia. This is not unexpected as there are multiple WRPs discharging to the San Gabriel River; these treated effluent discharges comprise roughly 80% of flow during the dry season, contributing as much as 99% of the total ammonia input (Ackerman et al., 2005). In 1992/93, ammonia levels averaged over 10 mg/L. In 2003, however, the WRPs fully implemented nitrification and denitrification treatment (NDN) processes, which subsequently reduced discharged ammonia levels more than 80% to an average of less than 2 mg/L (Figure 5). Thus, a reduction in toxicity for reaches in the San Gabriel River watershed dominated by WRP effluents can be easily explained.

The lack of toxicity observed in the current study is consistent with other toxicity data collected in recent years. In 2005, a probability-based watershed survey was conducted in the entire San Gabriel River watershed, and 7% of the stream-miles were considered toxic to *Ceriodaphnia* (Stein and Bernstein, in prep). Even this toxicity, however, was eliminated after a TIE and subsequent follow-up investigations helped identify and eliminate the illicit discharge responsible (T. Fleming, personal communication).

A second example of reduced toxicity in recent years was observed in routine toxicity monitoring required in the vicinity of the WRPs as a part of their National Pollutant Discharge Elimination System (NPDES) permit requirements (Appendix B). Between June 2003 and June 2006, only 14% of the 269 total samples from 14 different sites exhibited toxicity (i.e., greater than 25% response relative to controls). For this period, toxicity was largely constrained to Coyote Creek (6% of total number of samples) and the uppermost portions of San Jose Creek (6% of total number of samples). Coyote Creek is the same tributary in which the current study found intermittent toxicity. The uppermost section of San Jose Creek was not monitored during the current study.

In contrast to the main stem of the San Gabriel River where significant resources have been expended to reduce pollutant inputs and minimize toxicity, much less effort has been spent on identifying and remediating sources of toxic pollutants in the Coyote Creek subwatershed. As a result, the toxicity in Coyote Creek has remained. The frequency of toxicity in Coyote Creek has remained similar between 1992/93 and 2004/05; roughly 12% to 22% of the samples were considered toxic. Pesticides available for application by homeowners continue to be one toxicant of concern. Diazinon was identified in 2004/05 (this study), as well as in the 1992/93 study (UC Davis 1995). The toxicity observed in urban runoff-dominated reaches during this study was intermittent, which is consistent with contributions by homeowner pesticide use (Schiff and Tiefenthaler 2003), illegal/illicit discharges, and observations in other dry weather runoff toxicity studies (Greenstein et al. 2004).

ACKNOWLEDGEMENTS

Toxicity testing was conducted by the Los Angeles County Sanitation Districts (Jay P. Bottomley and the staff of the San Jose Creek Water Quality Laboratory) and Nautilus Environmental, Inc. (Chris Stransky, Howard Bailey and staff). Wet weather sampling was conducted by Mactec Engineering, Inc. (Jay Shrake and staff). Dry weather sampling was conducted by the Los Angeles County Sanitation Districts (Misty Rogalski and Jeaneal Davis) and the Southern California Coastal Water Research Project (Dario Diehl, David Tsukada, Dawn Petschauer and Diana Young). Information management was provided by Southern California Coastal Water Research Project (Jeff Brown and Larry Cooper). This project was partially supported by the Los Angeles Regional Water Quality Control Board.

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UC Davis Study Terry – do you have the correct citation?

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Figure 1. Map of the lower San Gabriel River Watershed including dry and wet weather sampling locations.

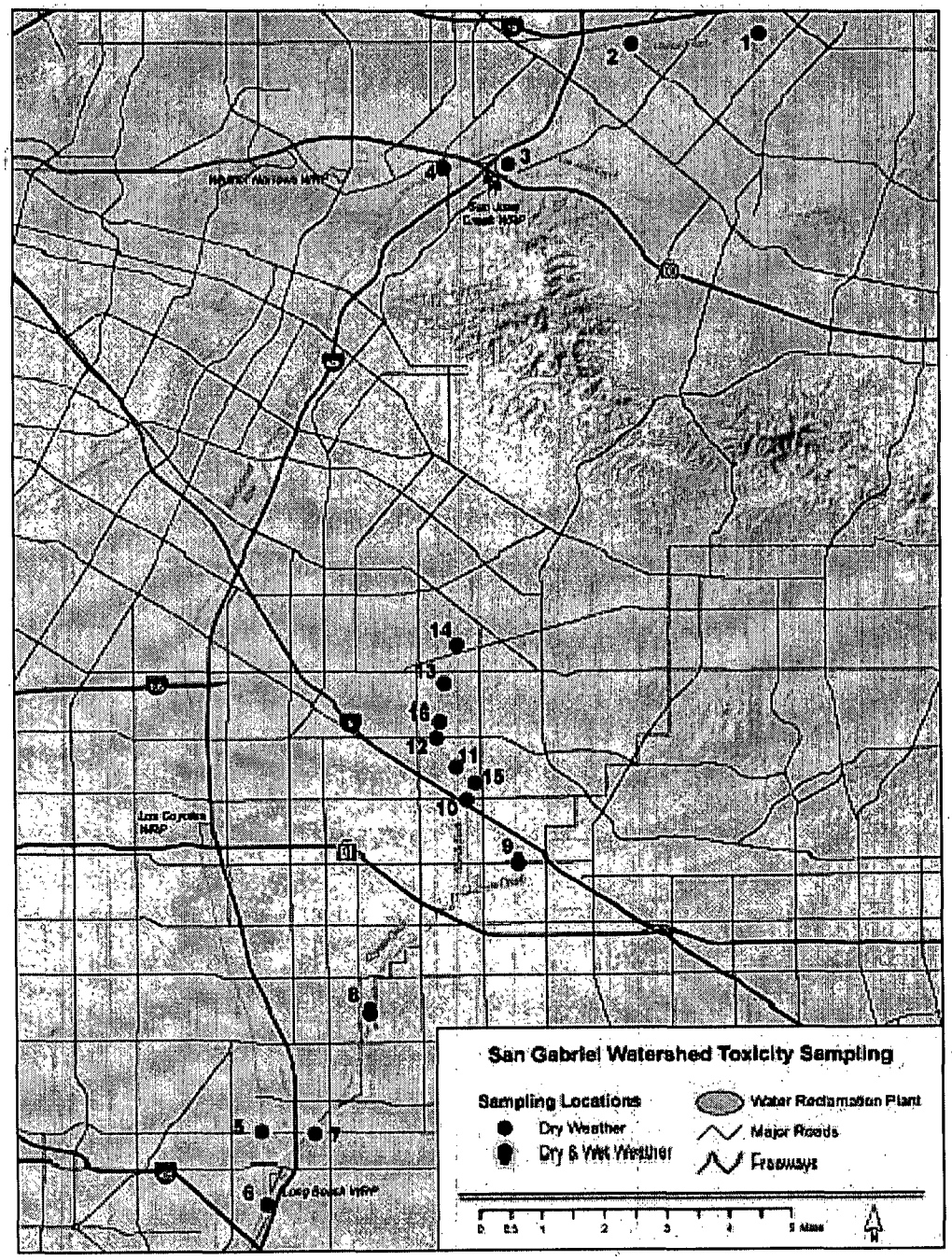
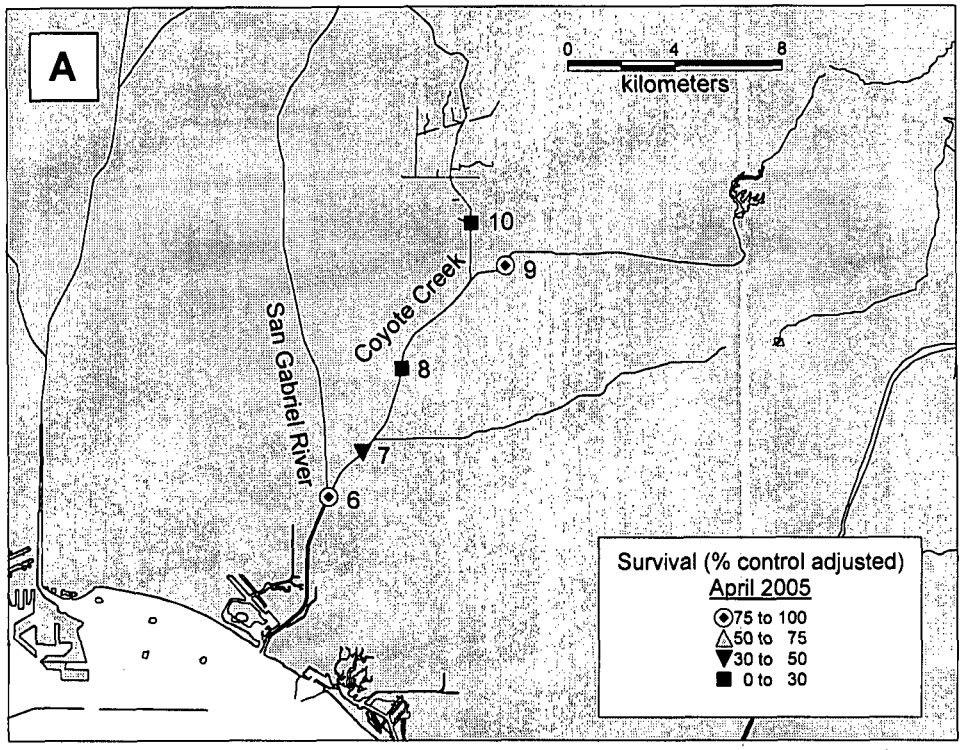


Figure 2. Survival in Coyote Creek on (A) April 2005 and (B) Augist 2005.



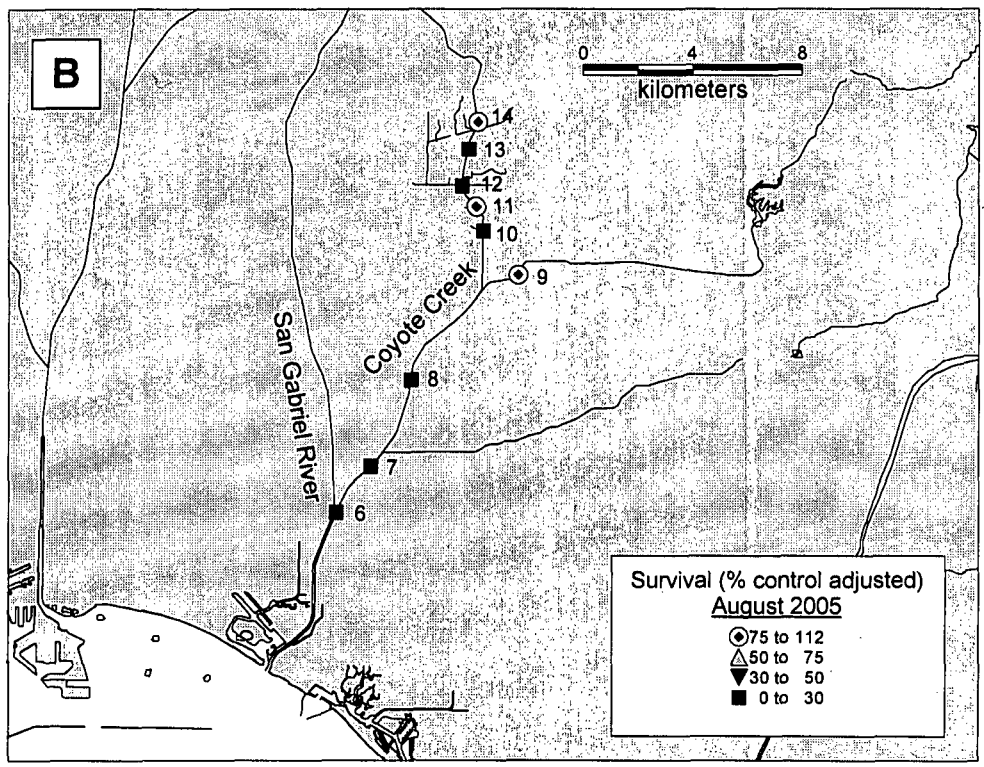


Figure 3. Acute Phase I TIE - site 9 sample collected on April 21, 2005.

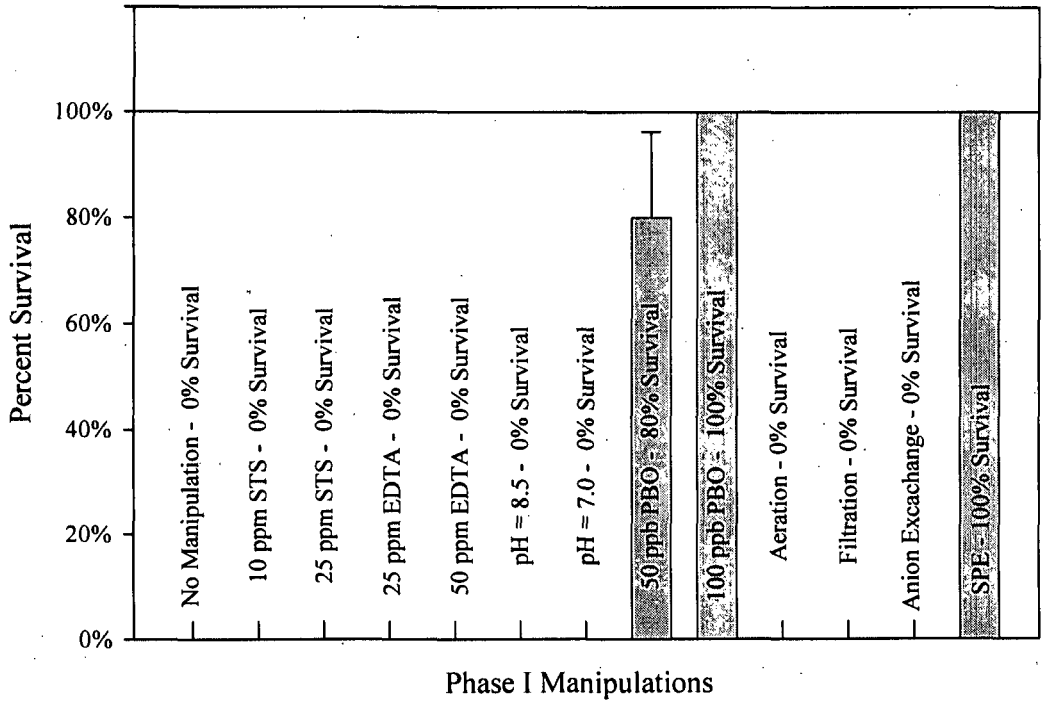


Figure 4. Acute Phase I TIE Solid Phase Extraction Elution Testing - Site 9 sample collected on April 21, 2005.

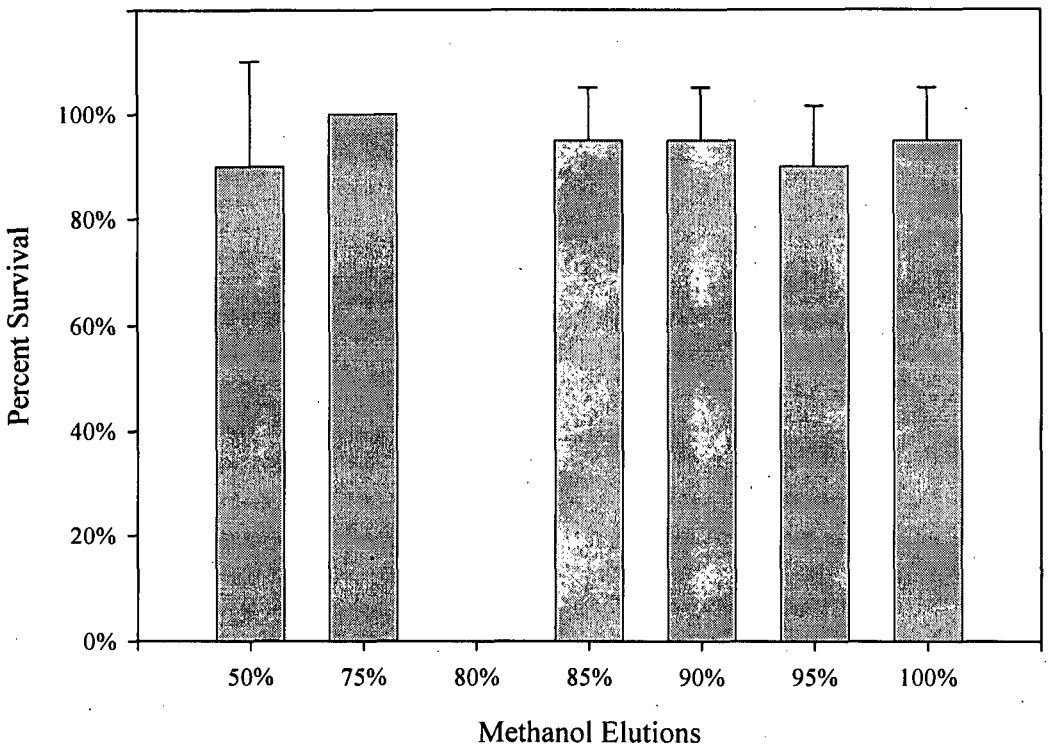


Figure 5. Time series plot of ammonia concentrations in final effluent and receiving water immediately downstream of the Los Coyotes WRP in the lower San Gabriel River Watershed. NDN plant upgrades were completed in June 2003.

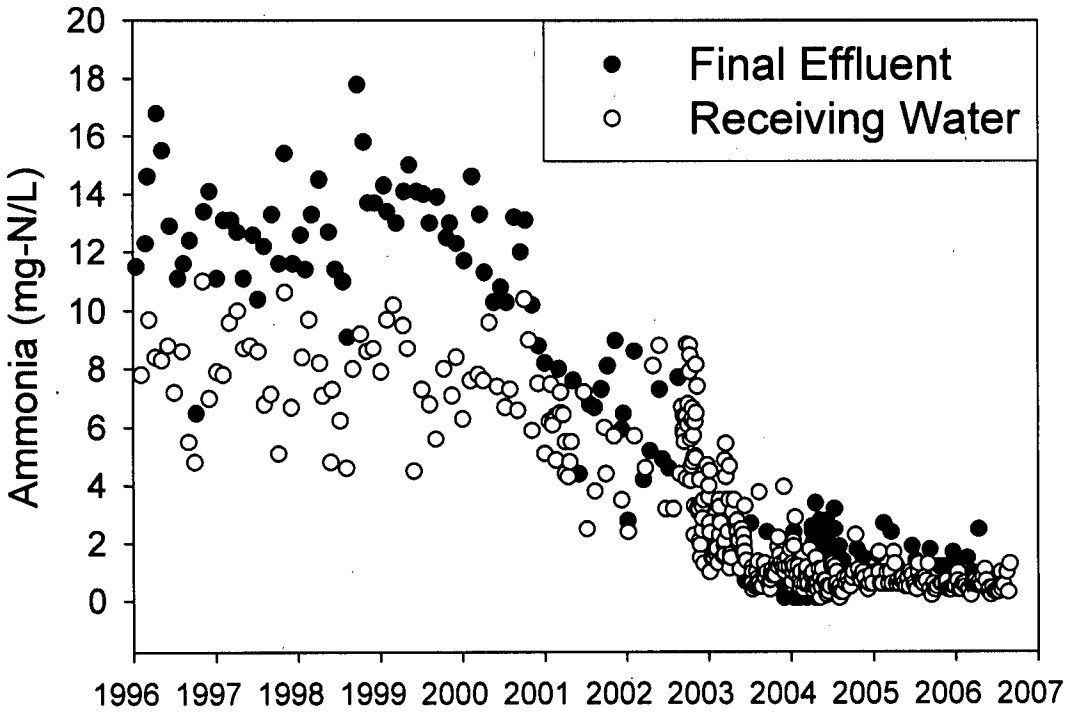


Table 1. Test conditions and requirements.

Test Organism:	*Ceriodaphnia dubia*
Organism Source:	In-house Cultures
Organism Age at Initiation:	<24 hours old and released within an eight hour period
Test Duration:	Until 60% or ore of the surviving females have three broods
Concentrations Tested:	0% and 100%
Solution Renewal:	Daily
Feeding:	0.1 ml YCT and 0.1 *Selenastrum* algal suspension daily
Test Chamber:	50 ml Disposable
Solution Volume:	15 ml
Control Water:	Either diluted mineral water (8 parts deionized water: 2 parts Perrier® water) or Reconstituted deionized water (hard)
Number of Replicates:	10
Organisms per Replicate:	1 assigned by blocking by known parentage
Photoperiod:	16 hours light (50-100 ft-c), 8 hours dark
Test Temperature:	25 $\pm$ 1° C.
Endpoints Measured:	Survival and Reproduction
Test Acceptability Criteria:	80% or greater survival with an average of 15 or more young per surviving female in the control organisms. 60% of surviving females in the controls must produce three broods within 8 days.

Table 2. Toxicity Identification Evaluation sample manipulations and their respective interpretations.

TIE Sample Manipulation	**Expected response**
pH Adjustment (pH 7 and 8.5)	Alters toxicity in pH sensitive compounds (i.e., ammonia and some trace metals)
Aeration	Reduces toxicity attributable to volatile, sublatable, and/or easily oxidizable compounds
Ethylenedinitrilo-Tetraacetic Acid (EDTA) Addition	Chelates trace metals, particularly divalent, cationic metals
Sodium thiosulfate (STS) Addition	Reduces toxicants attributable to oxidants (i.e., chlorine) and some trace metals
Filtration	Removes toxicity related to and/or associated with particulates
Solid Phase Extraction (SPE) with C_{18}	Removes toxicity associated with non-polar organics (i.e., pesticides, surfactants)
Sequential Solvent Extraction of with C_{18} Column	SPE extraction can be used to confirm toxicity due to nonpolar organic compounds. Sequential extraction using solvents of gradually decreasing polarity can separate these compounds into fractions providing further toxicant resolution and isolation for chemical analysis
Piperonyl Butoxide (PBO)	Removes toxicity caused by metabolically activated pesticides (i.e., organophosphorous pesticides). Increases toxicity attributable to pyrethroid pesticides
Anion Exchange	Removes toxicity associated with anionic compounds, including some trace metals and surfactants
No Manipulation	For comparing the relative effectiveness of other manipulations and quantifies the persistence of toxicity in the stored sample

Table 3. Summary of dry weather *Ceriodaphnia dubia* toxicity from San Gabriel River from March 2005 through August 2006.

	Month of Sample Collection																	
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.
Location	2005	2005	2005	2005	2005	2005	2005	2005	2005	2005	2006	2006	2006	2006	2006	2006	2006	2006
Walnut Creek																		
1	-	-	-	-	-	-	-	-	-	-	-	-						
2	-	-	-	-	-	-	-	-	-	-	-	-						
San Jose Creek Reach 1																		
3	-	-	-	-	-	-	-	-	-	-	-	-						
San Gabriel River Reach 3																		
4	-	-	-	-	-	-	-	-	-	-	-	-						
San Gabriel River Reach 1																		
5	-	-	-	-	-	-	-	-	-	-	-	-						
Coyote Creek																		
6	-	S[1]	-	-	-	L[1]S[1]	-	-	-	-	-	-						
7	-	L[1]S[1]	-	-	-	L[1]S[1]	-	-	-	-	-	-						
8	-	L[1]S[1]	-	S[1]	-	L[1]S[1]	-	-	-	-	-	-						
9	S[1]	-	-	-	-	-	L[1]S[1]	-	-	-	-	-	-	-	-	-	-	-
10	S[1]	L[1]S[1]	-	L[1]S[1]	-	L[1]S[1]	-	-	-	-	-	-	-	-	-	-	-	-
11					-	S[1]	-	-	-	-	-	-	-	-	-	-	-	-
12					-	L[1]S[1]	-	-	-	-	-	-	-	-	-	-	-	-
13					-	L[1]S[1]	-	-	-	-	-	-	-	-	-	-	-	-
14					-	L[1]S[1]	-	-	-	-	-	-	-	-	-	-	-	-
15								-	-	-	-[1]	-	S	-	-	-	-	-
16								-	-	-	-	-	-	-	-	-	-	-

Shaded = samples not collected

- Not Toxic – effects less than 25% relative to control.

L = Lethal effect; toxicity less than 75% relative to control

S = Sub-lethal effect; reproduction less than 75% relative to control

[1] – Statistically significant from control

Table 4. Summary of dry weather TIE results.

Site	Sample Date	TIE RESULTS (Survival in 100%)										
		No Manipulation	STS[a]	EDTA[b]	pH 7.0	pH 8.5	PBO[c]	Aeration	Filtration	Centrifuge	SPE	Anion
#9	Mar 2005	Sample No longer Toxic										
#10	Mar 2005	Sample No longer Toxic										
#10	Apr 2005	0%	0%	0%	0%	0%	0%[d]	35%	0%	NT	87.5%[e]	NT
#10	Jun 2005	0%	0%	0%	0%	0%	0%	10%	10%	30%	100%[e]	100%
#10	Aug 2005	0%	0%	0%	0%	0%	0%	0%	0%	NT	100%[e]	0%[f]
#9	Sep 2005	0%	0%	0%	0%	0%	100%[g]	0%	0%	NT	100%[e]	0%
#15	Mar 2006	Sample No longer Toxic										

NT = Not tested

a – Sodium thiosulfate addition, two treatments of 10 and 25 ppm

b – Ethylenedinitrilo-tetraacetic acid addition, two treatments of 25 and 50 ppm

c – Piperonyl butoxide addition, two treatments of 50 and 100 ppb

d – 5% survival observed in the 50 ppb treatment with 0% survival in the 100 ppb treatment

e – Toxicity recovered in only the 75% methanol elution

f – Survival observed in lower concentrations of the sample indicating partial toxicity removal

g – 80% survival observed in 50 ppb treatment and 100% survival in 100 ppb treatment

Appendix A

Study Monitoring Results

Table A 1. Dry weather baseline chronic toxicity testing results for Sites #3 through #10 using grab samples collected on March 31, 2005.

Sample	Mean Survival (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)	Mean Reproduction (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)
Control	100% (0)	100% (0)	30.5 (3.2)	100% (10.4)
Site #3	100% (0)	100% (0)	29.2 (2.0)	95.7% (6.5)
Site #4	100% (0)	100% (0)	34.4 (6.1)	113% (20.0)
Control	100% (0)	100% (0)	31.9 (2.9)	100% (9.1)
Site #5	100% (0)	100% (0)	31.0 (2.4)	97.2% (7.5)
Site #6	100% (0)	100% (0)	30.2 (5.9)	94.7% (18.4)
Control	100% (0)	100% (0)	34.5 (1.9)	100% (5.5)
Site #7	100% (0)	100% (0)	34.7 (2.5)	101% (7.4)
Site #8	100% (0)	100% (0)	32.8 (8.1)	95.1% (23.4)
Control	100% (0)	100% (0)	33.6 (4.1)	100% (12.3)
Site #9	100% (0)	100% (0)	24.6[a] (3.6)	73.2%[a] (10.6)
Site #10	100% (0)	100% (0)	20.8[a] (3.5)	61.9%[a] (10.5)

a: response statistically significant from control.

Table A 2. Dry weather baseline chronic toxicity testing results for Sites #3 through #10 using grab samples collected on April 21, 2005.

Sample	Mean Survival (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)	Mean Reproduction (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)
Control	90% (30.8)	100% (34.2)	31.6 (10.1)	100% (32.0)
Site #3	80% (42.2)	88.9% (46.8)	26.2 (14.5)	82.9% (46.0)
Site #4	90% (31.6)	100% (35.1)	29.4 (11.1)	93.0% (35.0)
Site #5	90% (31.6)	100% (35.1)	26.2 (10.4)	82.9% (32.9)
Site #6	90% (31.6)	100% (35.1)	1.1[a] (3.5)	3.5%[a] (11.0)
Site #7	40%[a] (51.6)	44.4%[a] (57.4))	0[a] (0)	0%[a] (0)
Site #8	0%[a] (0)	0%[a] (0)	0[a] (0)	0%[a] (0)
Site #9	90% (31.6)	100% (35.1)	28.7 (12.7)	90.8% (40.3)
Site #10	0%[a] (0)	0%[a] (0)	0[a] (0)	0%[a] (0)

a: response statistically significant from control.

Table A 3. Dry weather baseline chronic toxicity testing results for Sites #3 through #10 using grab samples collected on May 20, 2005.

Sample	Mean Survival (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)	Mean Reproduction (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)
Control	95% (22.9)	100% (24.1)	34.35 (5.8)	100% (17.0)
Site #3	100% (0)	105% (0)	38.3 (2.5)	112% (7.3)
Site #4	100% (0)	105% (0)	39.4 (2.2)	115% (7.0)
Site #5	100% (0)	105% (0)	39.3 (2.9)	114% (8.6)
Site #6	100% (0)	105% (0)	38 (2.5)	111% (7.4)
Site #7	100% (0)	105% (0)	37.4 (3.0)	109% (8.6)
Site #8	100% (0)	105% (0)	36.9 (3.6)	107% (10.6)
Site #9	100% (0)	105% (0)	36.6 (2.9)	107% (8.5)
Site #10	100% (0)	105% (0)	34.2 (2.4)	99.6% (7.1)

Table A 4. Dry weather baseline chronic toxicity testing results for Sites #3 through #10 using grab samples collected on June 23, 2005.

Sample	Mean Survival (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)	Mean Reproduction (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)
Control	100% (0)	100% (0)	20.6 (6.6)	100% (32.2)
Site #3	100% (0)	100% (0)	20.4 (7.3)	99.3% (35.4)
Site #4	100% (0)	100% (0)	23.7 (5.7)	115% (27.8)
Site #5	100% (0)	100% (0)	21.2 (5.8)	103% (28.1)
Site #6	100% (0)	100% (0)	19 (7.3)	92.5% (35.4)
Site #7	100% (0)	100% (0)	16.8 (4.2)	81.8% (20.6)
Site #8	100% (0)	100% (0)	0.7[a] (1.1)	3.4%[a] (5.2)
Site #9	100% (0)	100% (0)	27.5 (6.5)	134% (31.8)
Site #10	0%[a] (0)	0%[a] (0)	0.5[a] (1.6)	2.4%[a] (7.7)

a: response statistically significant from control..

Table A 5. Dry weather baseline chronic toxicity testing results for Sites #3 through #14 using grab samples collected on July 28, 2005.

Sample	Mean Survival (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)	Mean Reproduction (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)
Control	100% (0)	100% (0)	25.4 (6.1)	100% (24.2%)
Site #3	100% (0)	100% (0)	33.5 (1.6)	132% (6.5%)
Site #4	90% (31.6%)	90% (31.6%)	26.2 (10.3)	103% (40.5%)
Site #5	80% (42.2%)	80% (42.2%)	21.2 (12.1)	83.5% (47.7%)
Site #6	100% (0)	100% (0)	31.2 (4.1)	123% (16.2%)
Site #7	100% (0)	100% (0)	35.4 (3.4)	139% (13.4%)
Site #8	90% (31.6%)	90% (31.6%)	35.5 (7.2)	140% (28.3%)
Site #9	100% (0)	100% (0)	34.3 (2.8)	135% (10.8%)
Site #10	100% (0)	100% (0)	35.6 (5.6)	140% (22.2%)
Site #11	90% (31.6%)	90% (31.6%)	29.5 (13.6)	116% (53.6%)
Site #12	100% (0)	100% (0)	32.2 (2.4)	127% (9.4%)
Site #13	100% (0)	100% (0)	32.6 (5.6)	128% (22.1%)
Site #14	100% (0)	100% (0)	31.9 (11.6)	126% (45.9%)

Table A 6. Dry weather baseline chronic toxicity testing results for Sites #3 through #14 using grab samples collected on August 18, 2005.

Sample	Mean Survival (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)	Mean Reproduction (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)
Control	90% (31.5)	100% (35.0)	18.2 (10.3)	100% (56.6)
Site #3	100% (0)	111.1% (0)	20.7 (7.5)	114% (41.0)
Site #4	90% (31.6)	100% (35.1)	22.6 (11.6)	124% (64.0)
Site #5	80% (42.2)	88.9% (46.8)	17.1 (9.6)	93.6% (52.7)
Site #6	0%[a] (0)	0%[a] (0)	0[a] (0)	0%[a] (0)
Site #7	0%[a] (0)	0%[a] (0)	0[a] (0)	0%[a] (0)
Site #8	0%[a] (0)	0%[a] (0)	0[a] (0)	0%[a] (0)
Site #9	100% (0)	111.1% (0)	24.1 (6.0)	132% (32.8)
Site #10	0%[a] (0)	0%[a] (0)	0[a] (0)	0%[a] (0)
Site #11	90% (31.6)	100% (35.1)	0.9[a] (1.7)	5.0%[a] (9.1)
Site #12	0%[a] (0)	0%[a] (0)	0[a] (0)	0%[a] (0)
Site #13	0%[a] (0)	0%[a] (0)	0[a] (0)	0%[a] (0)
Site #14	70%[a] (48.3)	77.8%[a] (53.7)	1.1[a] (2.6)	6.0%[a] (14.3)

a: response statistically significant from control.

Table A 7. Dry weather baseline chronic toxicity testing results for Sites #3 through #16 using grab samples collected on September 29, 2005. Sites #3 through #9 were initiated with the Control #1 set of neonates, and sites #10 through #16 were initiated with the Control #2 set of neonates, and statistics for each site were run relative to the control set.

Sample	**Mean Survival (Std. Dev.)**	Survival Response Relative to Control **(Std. Dev.)**	**Mean Reproduction (Std. Dev.)**	**Survival Response Relative to Control (Std. Dev.)**
Control	100% (0)	100% (0)	29.8 (2.7)	100% (8.9)
Site #3	100% (0)	100% (0)	38.4 (6.0)	129% (20.2)
Site #4	100% (0)	100% (0)	34.4 (3.9)	115% (13.2)
Site #5	100% (0)	100% (0)	31.0 (4.5)	104% (15.3)
Site #6	100% (0)	100% (0)	30.0 (4.4)	101% (14.8)
Site #7	90% (31.6)	90% (31.6)	33.0 (5.7)	111% (19.2)
Site #8	100% (0)	100% (0)	32.5 (7.7)	109% (26.0)
Site #9	0%[a] (0)	0%[a] (0)	0[a] (0)	0%[a] (0)
Control	90% (31.6)	100% (35.1)	22.3 (11.3)	100% (50.8)
Site #10	90% (31.6)	100% (35.1)	25.4 (13.5)	114% (60.7)
Site #11	100% (0)	111% (0)	31.7 (5.2)	142% (23.4)
Site #12	100% (0)	111% (0)	23.7 (7.3)	106% (32.8)
Site #13	100% (0)	111% (0)	22.2 (7.0)	99.6% (31.3)
Site #14	90% (31.6)	100% (35.1)	24.3 (9.1)	109% (41.0)
Site #15	90% (31.6)	100% (35.1)	26.8 (10.0)	120% (11.3)
Site #16	90% (31.6)	100% (35.1)	28.5 (11.3)	128% (50.8)

a: response statistically significant from control.

Table A 8. Dry weather baseline chronic toxicity testing results for Sites #3 through #16 (including the site designated "Site 11.5") using grab samples collected on October 27, 2005.

Sample	Mean Survival (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)	Mean Reproduction (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)
Control	100% (0)	100% (0)	20.8 (9.0)	100% (43.4)
Site #3	100% (0)	100% (0)	34.3 (4.9)	165% (23.8)
Site #4	100% (0)	100% (0)	42.5 (3.7)	205% (17.9)
Site #5	90% (31.6)	90% (31.6)	34.1 (12.9)	164% (62.1)
Site #6	90% (31.6)	90% (31.6)	28.2 (5.6)	136% (26.8)
Site #7	100% (0)	100% (0)	36.6 (5.2)	176% (24.9)
Site #8	100% (0)	100% (0)	36.1 (5.3)	174% (25.3)
Site #9	100% (0)	100% (0)	31.8 (5.7)	153% (27.4)
Site #10	100% (0)	100% (0)	35.5 (2.5)	171% (12.1)
Site #11	100% (0)	100% (0)	32.4 (5.3)	156% (25.4)
Site #11.5	100% (0)	100% (0)	10.6[a] (1.2)	51.1%[a] (5.7)
Site #12	100% (0)	100% (0)	34.0 (9.0)	164% (43.4)
Site #13	90% (31.6)	90% (31.6)	31.1 (11.4)	150% (54.9)
Site #14	100% (0)	100% (0)	35.6 (4.5)	172% (21.5)
Site #15	100% (0)	100% (0)	30.6 (4.7)	148% (22.5)
Site # 16	100% (0)	100% (0)	33.4 (5.6)	161% (26.8)

a: response statistically significant from control.

Table A 9. Dry weather baseline chronic toxicity testing results for Sites #3 through #16 using grab samples collected on November 15, 2005. Sites #3 through #9 were initiated with the Control #1 set of neonates, and sites #10 through #16 were initiated with the Control #2 set of neonates, and statistics for each site were run relative to the control set.

Sample	Mean Survival (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)	Mean Reproduction (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)
Control	100% (0)	100% (0)	32.5 (3.0)	100% (9.1)
Site #3	100% (0)	100% (0)	29.0 (5.6)	89.2% (17.2)
Site #4	100% (0)	100% (0)	37.4 (2.9)	115% (8.8)
Site #5	90% (31.6)	90% (31.6)	34.9 (5.9)	107% (18.2)
Site #6	90% (31.6)	90% (31.6)	26.4 (9.2)	81.2% (28.2)
Site #7	100% (0)	100% (0)	37.2 (4.0)	114% (12.5)
Site #8	90% (31.6)	90% (31.6)	31.5 (11.4)	97.0% (35.0)
Site #9	100% (0)	100% (0)	34.2 (5.9)	105% (18.1)
Control	100% (0)	100% (0)	27.5 (4.5)	100% (16.5)
Site #10	100% (0)	100% (0)	35.9 (6.6)	130% (24.0)
Site #11	100% (0)	100% (0)	39.5 (3.3)	144% (12.0)
Site #12	100% (0)	100% (0)	36.0 (4.2)	131% (15.3)
Site #13	100% (0)	100% (0)	34.8 (3.7)	126% (13.5)
Site #14	100% (0)	100% (0)	33.5 (4.7)	122% (17.1)
Site #15	100% (0)	100% (0)	32.2 (4.4)	117% (16.1)
Site #16	100% (0)	100% (0)	38.9 (2.9)	142% (10.5)

Table A 10. Dry weather baseline chronic toxicity testing results for Sites #3 through #16 using grab samples collected on December 8, 2005. Sites #3 through #9 were initiated with the Control #1 set of neonates, and sites #10 through #16 were initiated with the Control #2 set of neonates, and statistics for each site were run relative to the control set.

Sample	Mean Survival (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)	Mean Reproduction (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)
Control	100% (0)	100% (0)	32.4 (2.6)	100% (8.2)
Site #3	100% (0)	100% (0)	31.6 (4.0)	97.5% (12.3)
Site #4	100% (0)	100% (0)	30.1 (3.1)	92.9% (9.6)
Site #5	100% (0)	100% (0)	28.6 (2.8)	88.3% (8.6)
Site #6	100% (0)	100% (0)	29.9 (3.3)	92.3% (10.3)
Site #7	100% (0)	100% (0)	32.9 (2.9)	102% (9.0)
Site #8	100% (0)	100% (0)	32.0 (4.8)	98.8% (14.7)
Site #9	100% (0)	100% (0)	31.0 (3.6)	95.7% (11.1)
Control	100% (0)	100% (0)	32.1 (2.7)	100% (8.5)
Site #10	100% (0)	100% (0)	33.9 (3.3)	106% (10.3)
Site #11	90% (31.6)	90% (31.6)	31.2 (4.6)	87.5% (33.6)
Site #12	100% (0)	100% (0)	31.5 (2.4)	98.1% (7.4)
Site #13	100% (0)	100% (0)	27.6 (5.8)	85.8% (18.2)
Site #14	100% (0)	100% (0)	29.8 (6.6)	92.8% (20.5)
Site #15	90% (31.6)	90% (31.6)	26.2 (3.1)	81.7% (9.6)
Site #16	90% (31.6)	90% (31.6)	31.0 (3.9)	96.6% (12.3)

Table A 11. Dry weather baseline chronic toxicity testing results for Sites #3 through #16 using grab samples collected on January 20, 2006. Sites #3 through #9 were initiated with the Control #1 set of neonates, and sites #10 through #16 were initiated with the Control #2 set of neonates, and statistics for each site were run relative to the control set.

Sample	**Mean Survival (Std. Dev.)**	Survival Response Relative to Control **(Std. Dev.)**	**Mean Reproduction (Std. Dev.)**	**Survival Response Relative to Control (Std. Dev.)**
Control #1	100% (0)	100% (0)	33.7 (3.3)	100% (9.8)
Site #3	100% (0)	100% (0)	31.4 (5.9)	93.2% (17.4)
Site #4	100% (0)	100% (0)	34.4 (2.7)	102% (8.1)
Site #5	100% (0)	100% (0)	37.4 (2.7)	111% (7.9)
Site #6	90% (31.6)	90% (31.6)	30.4 (11.2)	90.2% (33.1)
Site #7	100% (0)	100% (0)	35.6 (3.5)	106% (10.4)
Site #8	100% (0)	100% (0)	35.4 (3.5)	105% (10.5)
Site #9	100% (0)	100% (0)	30.7 (5.1)	91.1% (15.0)
Control #2	100% (0)	100% (0)	33.5 (2.0)	100% (6.0)
Site #10	100% (0)	100% (0)	34.5 (3.2)	103% (9.5)
Site #11	100% (0)	100% (0)	30.3 (10.9)	90.4% (32.6)
Site #12	80% (42.2)	80% (42.2)	30.6 (12.1)	91.3% (36.2)
Site #13	100% (0)	100% (0)	30.2 (4.5)	90.1% (13.3)
Site #14	100% (0)	100% (0)	29.4 (4.1)	87.8% (12.4)
Site #15	100% (0)	100% (0)	26.5[a] (2.0)	79.1%[a] (5.8)
Site #16	100% (0)	100% (0)	29.4 (3.6)	87.8% (10.8)

a: response statistically significant from control.

Table A 12. Dry weather baseline chronic toxicity testing results for Sites #3 through #16 using grab samples collected on February 23, 2006. Sites #3 through #9 were initiated with the Control #1 set of neonates, and sites #10 through #16 were initiated with the Control #2 set of neonates, and statistics for each site were run relative to the control set.

Sample	Mean Survival (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)	Mean Reproduction (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)
Control #1	90% (31.6)	100% (35.1)	23.8 (10.4)	100% (43.9)
Site #3	100% (0)	111.1% (0)	31.4 (3.2)	132% (13.6)
Site #4	100% (0)	111.1% (0)	35.7 (3.1)	150% (12.8)
Site #5	90% (31.6)	100% (35.1)	30.6 (11.4)	129% (47.7)
Site #6	70% (48.3)	77.8% (31.6)	23.6 (16.4)	99.2% (68.8)
Site #7	100% (0)	111.1% (0)	28.5 (5.5)	120% (23.0)
Site #8	90% (31.6)	100% (35.1)	25.6 (11.1)	108% (46.7)
Site #9	100% (0)	111.1% (0)	30.1 (4.8)	126% (20.3)
Control #2	100% (0)	100% (0)	26.2 (6.4)	100% (24.4)
Site #10	90% (31.6)	90% (31.6)	31.0 (12.6)	118% (48.0)
Site #11	90% (31.6)	90% (31.6)	24.9 (11.3)	95.0% (43.1)
Site #12	90% (31.6)	90% (31.6)	27.6 (11.3)	105% (43.1)
Site #13	100% (0)	100% (0)	30.6 (7.8)	117% (29.8)
Site #14	100% (0)	100% (0)	29.6 (7.4)	113% (28.3)
Site #15	90% (31.6)	90% (31.6)	28.8 (11.9)	110% (45.6)
Site #16	80% (42.2)	80% (42.2)	26.3 (14.3)	100% (54.5)

Table A 13. Dry weather baseline chronic toxicity testing results for Sites #9 through #16 using grab samples collected on March 24, 2006.

Sample	Mean Survival (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)	Mean Reproduction (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)
Control	100% (0)	100% (0)	24.9 (8.0)	100% (43.9)
Site #9	100% (0)	100% (0)	20.4 (9.9)	81.9% (39.7)
Site #10	100% (0)	100% (0)	24.7 (13.8)	99.2% (55.3)
Site #11	100% (0)	100% (0)	21.6 (15.9)	86.7% (63.8)
Site #12	100% (0)	100% (0)	26.0 (12.1)	104% (48.5)
Site #13	100% (0)	100% (0)	23.5 (10.9)	95.1% (44.1)
Site #14	100% (0)	100% (0)	22.7 (14.1)	91.2% (56.6)
Site #15	100% (0)	100% (0)	17.2 (15.5)	72.3% (65.1)
Site #16	90% (31.6)	90% (31.6)	24.6 (12.0)	98.8% (48.3)

Table A 14. Dry weather baseline chronic toxicity testing results for Sites #9 through #16 using grab samples collected on April 27, 2006.

Sample	Mean Survival (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)	Mean Reproduction (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)
Control	100% (0)	100% (0)	28.4 (2.5)	100% (8.9)
Site #9	100% (0)	100% (0)	30.2 (6.1)	106% (21.6)
Site #10	100% (0)	100% (0)	36.4 (4.1)	128% (14.5)
Site #11	100% (0)	100% (0)	38.8 (4.5)	137% (15.9)
Site #12	90% (31.6)	90% (31.6)	38.4 (3.7)	135% (13.1)
Site #13	100% (0)	100% (0)	36.1 (8.5)	127% (29.9)
Site #14	100% (0)	100% (0)	30.2 (8.4)	106% (29.4)
Site #15	100% (0)	100% (0)	34.0 (4.1)	120% (14.6)
Site #16	100% (0)	100% (0)	30.7 (2.9)	108% (10.2)

Table A 15. Dry weather baseline chronic toxicity testing results for Sites #9 through #16 using grab samples collected on May 19, 2006.

Sample	Mean Survival (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)	Mean Reproduction (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)
Control	100% (0)	100% (0)	28.4 (4.4)	100% (15.6)
Site #9	90% (31.6)	90% (31.6)	23.6 (8.2)	83.1% (29.0)
Site #10	100% (0)	100% (0)	28.8 (5.4)	101% (19.0)
Site #11	100% (0)	100% (0)	29.2 (5.3)	103% (18.5)
Site #12	100% (0)	100% (0)	29.2 (5.3)	103% (18.5)
Site #13	100% (0)	100% (0)	34.2 (3.3)	120% (11.7)
Site #14	100% (0)	100% (0)	33.8 (3.2)	119% (11.1)
Site #15	100% (0)	100% (0)	34.1 (2.8)	120% (9.7)
Site #16	100% (0)	100% (0)	32.0 (3.9)	113% (13.7)

Table A 16. Dry weather baseline chronic toxicity testing results for Sites #9 through #16 using grab samples collected on June 20, 2006.

Sample	Mean Survival (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)	Mean Reproduction (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)
Control	90% (31.6)	100% (31.6)	27.5 (8.3)	100% (30.3)
Site #9	100% (0)	111% (0)	25.6 (3.9)	93.1% (14.3)
Site #10	100% (0)	111% (0)	31.8 (6.4)	116% (23.3)
Site #11	100% (0)	111% (0)	31.5 (10.6)	114% (38.7)
Site #12	100% (0)	111% (0)	34.7 (2.9)	126% (10.6)
Site #13	100% (0)	111% (0)	31.9 (4.6)	116% (16.7)
Site #14	100% (0)	111% (0)	36.2 (3.6)	132% (13.3)
Site #15	100% (0)	111% (0)	35.2 (3.6)	128% (13.0)
Site #16	90% (31.6)	100% (31.6)	347 (3.3)	126% (12.1)

Table A 17. Dry weather baseline chronic toxicity testing results for Sites #9 through #16 using grab samples collected on July 27, 2006.

Sample	Mean Survival (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)	Mean Reproduction (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)
Control	100% (0)	100% (0)	27.2 (4.3)	100% (15.8)
Site #9	90% (31.6)	90% (31.6)	33.7 (2.3)	124% (8.3)
Site #10	100% (0)	100% (0)	33.9 (3.3)	125% (12.3)
Site #11	100% (0)	100% (0)	36.1 (3.0)	133% (10.9)
Site #12	90% (31.6)	90% (31.6)	29.4 (10.2)	108% (37.5)
Site #13	100% (0)	100% (0)	31.7 (4.8)	117% (17.8)
Site #14	100% (0)	100% (0)	32.5 (4.1)	119% (15.2)
Site #15	100% (0)	100% (0)	32.4 (3.9)	119% (14.4)
Site #16	100% (0)	100% (0)	29.6 (7.7)	108% (28.4)

Table A 18. Dry weather baseline chronic toxicity testing results for Sites #9 through #16 using grab samples collected on August , 2006.

Sample	Mean Survival (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)	Mean Reproduction (Std. Dev.)	Survival Response Relative to Control (Std. Dev.)
Control				
Site #9				
Site #10				
Site #11				
Site #12				
Site #13				
Site #14				
Site #15				
Site #16				

Appendix B

NPDES Monitoring Results

Appendix A: NPDES Chronic Toxicity Monitoring Conducted from June 2003 through June 2006 in the San Gabriel River Watershed

INTRODUCTION

The Sanitation Districts of Los Angeles County own and operate five Water Reclamation Plants (WRPs) that discharge in the San Gabriel River Watershed. Each WRP operates under an individual NPDES permit. These permits require toxicity tests be conducted at a number of receiving water stations within the watershed at defined frequencies. Results of recent chronic toxicity monitoring conducted as part of the NPDES monitoring program are presented in this appendix.

Toxicity results for receiving waters before June 2003 are not presented; the WRPs in the watershed added nitrification and denitrification (NDN) to their respective facilities in the first half of 2003. Before NDN, the effluent from the plants often had ammonia concentrations above 10 mg/L. After the addition of NDN, the ammonia effluent concentration from each plant averages less than 2 mg/L. Since ammonia concentrations at pre-NDN levels can cause toxicity and that potential source of toxicity has been greatly lessened (ammonia concentrations of 2 mg/L or less are not expected to cause chronic toxicity), only results from after the initiation of NDN is presented herein. In that way, it is known the ammonia contribution to toxicity has been minimized and other potential causes of toxicity can be investigated.

MATERIALS AND METHODS

Chronic toxicity test results are presented for four reaches within the San Gabriel River Watershed. Three different species were used at various times for the chronic toxicity tests during the June 2003 to June 2006 testing period. The test conditions and requirements followed for all these tests are contained in Table B.1, B.2, and B.3.

The locations of receiving water stations in the San Gabriel River Watershed are shown on Figure A.1. The tests conducted as part of NPDES chronic toxicity monitoring are listed in Table B.4. This data set consisted of 269 chronic toxicity tests using receiving water samples collected from San Gabriel River Reach 3 (27 tests), San Jose Creek Reach 1 (55 tests), San Gabriel River Reach 1 (121 tests), and Coyote Creek (66 tests).

All receiving water was monitored in dry weather conditions with no samples collected within 48 hours of any significant rain event. Testing was conducted by a California Department of Heath Services-certified laboratory using USEPA Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving waters to Freshwater Organisms, 3rd or 4th Edition. Concurrent positive control reference toxicant testing meeting all required test acceptability criteria were conducted with each test. Acute (lethality) and chronic (reproduction or growth) endpoints were evaluated in the *Ceriodaphnia dubia* and *Pimephales promelas* tests. The green algae test (*Pseudokirchneriella subcapitata*) only consisted of a single chronic (cell density) endpoint.

One to three receiving water grab samples of 4 to 12 liters were collected depending on the species being tested. For the green algae test, a single grab consisting of 4 liters were collected and used for the entire test. For *Ceriodaphnia dubia* and *Pimephales promelas* testing, a minimum of three grab samples (with volumes ranging from 4 to 12 liters) were collected and used during the seven-day test. In all instances, each sample was first used within 36 hours of collection and used for subsequent renewals for no longer than 72 hours after collection. The number of receiving water locations and minimum frequency of testing was specified in the NPDES permits and ranged from monthly to quarterly depending on the permit.

The NPDES permits define chronic toxicity as a TUc (toxicity unit) of >1.0 with the TUc calculated as 100/NOEC (the no observable effect concentration (or NOEC) is the highest concentration not

statistically significant from the control). NPDES permits require the initiation of weekly accelerated testing for six weeks if the monthly median exceeds 1.0 TUc at the location immediately downstream from a WRP discharge. If two of six weekly accelerated tests exceed 1.0 TUc, the appropriate plant-specific Toxicity Reduction Evaluation workplan is initiated which most often includes the initiation of phase I toxicity identification evaluation (TIE) testing. This protocol was followed in all cases when the monthly median TUc exceeded 1.0.

To be consistent with other results included in this study, an effect of greater than 25% in 100% receiving water was identified as "toxicity". However, statistically significant differences using EPA protocol outlined hypothesis testing methods are also noted.

Table B.1. Test conditions and requirements followed for all *Ceriodaphnia dubia* tests.

Test Organism:	*Ceriodaphnia dubia*
Organism Source:	In-house Cultures
Organism Age at Initiation:	<24 hours old and released within an eight hour period
Test Duration:	Until 60% or ore of the surviving females have three broods
Concentrations Tested:	At least 0% and 100%, in some instances intermediate concentrations were also tested
Solution Renewal:	Daily
Feeding:	0.1 ml YCT and 0.1 *Selenastrum* algal suspension daily
Test Chamber:	50 ml Disposable
Solution Volume:	15 ml
Control Water:	Reconstituted deionized water (hard or moderately hard)
Number of Replicates:	10
Organisms per Replicate:	1 assigned by blocking by known parentage
Photoperiod:	16 hours light (50-100 ft-c), 8 hours dark
Test Temperature:	25 $\pm 1^{\circ}$ C.
Endpoints Measured:	Survival and Reproduction
Reference Toxicant Testing	Concurrent reference toxicant test conducted meeting all test acceptability requirements
Test Acceptability Criteria:	80% or greater survival with an average of 15 or more young per surviving female in the control organisms. 60% of surviving females in the controls must produce three broods within 8 days.

Table B.2. Test conditions and requirements followed for all *Pimephales promelas tests.*

Test Organism:	*Pimephales promelas*
Organism Source:	Commercial supplier
Organism Age at Initiation:	<24 hours old
Test Duration:	Seven days
Concentrations Tested:	At least 0% and 100%, in some instances intermediate concentrations were also tested
Solution Renewal:	Daily
Feeding:	1500 newly hatched *artemia* per beaker, twice daily
Test Chamber:	400 ml glass beakers
Solution Volume:	250 ml
Control Water:	Reconstituted deionized water (hard and moderately hard)
Number of Replicates:	4
Organisms per Replicate:	10
Photoperiod:	16 hours light (50-100 ft-c), 8 hours dark
Test Temperature:	25 ±1° C.
Endpoints Measured:	Survival and Growth (biomass)
Reference Toxicant Testing	Concurrent reference toxicant test conducted meeting all test acceptability requirements
Test Acceptability Criteria:	80% or greater survival with an average of 0.25 mg/surviving larvae in the control organisms.

Table B.3. Test conditions and requirements followed for all ***Pseudokirchneriella subcapitata*** tests.

Test Organism:	*Pseudokirchneriella subcapitata*
Organism Source:	In-house Cultures and commercial suppliers
Organism Age at Initiation:	4 to 7 day-old cultures
Test Duration:	96 hours
Concentrations Tested:	At least 0% and 100%, in some instances intermediate concentrations were also tested
Solution Renewal:	None
Feeding:	None
Test Chamber:	50 ml Disposable
Solution Volume:	15 ml
Control Water:	Algal stock medium with EDTA prepared using deionized water
Number of Replicates:	4
Organisms per Replicate:	10,000 cells per ml
Photoperiod:	Continuous (360 - 440-c)
Test Temperature:	25 ±1° C.
Endpoints Measured:	Growth (chlorophyll fluorescence)
Reference Toxicant Testing	Concurrent reference toxicant test conducted meeting all test acceptability requirements
Test Acceptability Criteria:	Mean cell density of 1 X 10^6 cells per ml in the controls and control CV equal to or less than 20%

Table B.4. NPDES receiving water chronic toxicity testing from June 2003 through June 2006

REACH	SITE	VALID NPDES CHRONIC TESTS CONDUCTED			
		Pimephales promelas	*Ceriodaphnia dubia*	*Pseudokirchneriella subcapitata*	TOTAL
San Gabriel River Reach 3	R11	12	3	1	16
	WN-RA	11	0	0	11
San Jose Creek Reach 1	POM-RA	1	16	0	17
	POM-RC	1	7	0	8
	POM-RD	1	7	0	8
	C1	8	0	1	9
	C2	8	4	1	13
San Gabriel River Reach 1	R2	7	0	1	8
	R3-1	21	16	0	37
	R4	21	18	0	39
	R9W	21	16	0	37
Coyote Creek	RA1	6	20	0	26
	RA	6	22	0	28
	R9E	6	6	0	12

RESULTS

Toxicity monitoring results are presented below for the four reaches in the San Gabriel River Watershed for which there are monitoring results. To be consistent with the toxicity results reported in the main report, results in this appendix are reported as not toxic if less than a 25% effect is observed in the site sample relative to the control. However, statistically significant differences are also noted.

San Gabriel River Reach 3

A total of 27 valid chronic toxicity tests have been conducted since June 2003 with samples collected at two receiving water stations in Reach 3 of the San Gabriel River (see Figure A.1). Both receiving water stations are located downstream of two discharge points of the San Jose Creek WRP. Effects greater than 25% were observed in only two tests. Statistically significant effects were observed in three of the 29 tests. A summary of these results is contained in Table B.5. No consistent toxicity was observed in this reach.

San Jose Creek Reach 1

A total of 55 valid chronic toxicity tests were conducted with samples collected from five receiving water stations in San Jose Creek Reach 1. Effects greater than 25% were observed in 17 of the 55 tests with statistically significant effects observed in 22 of the 55 tests. Most of the observed effects were in the samples from stations POM-RA, POM-RC, and POM-RD and not from stations C1 or C2 (14 tests and 3 tests, respectively). The Pomona WRP discharges upstream of station POM-RA and the San Jose Creek WRP has a discharge downstream of station C1 (and upstream of C2). A summary of the toxicity results is contained in A.6. As shown in the table, the majority of the observed toxicity in this reach has been confined to the upstream area of San Jose Creek.

The toxicity testing for stations POM-RA, POM-RC and POM-RD are governed by the NPDES requirements for the Pomona WRP. Accelerated receiving water monitoring and Toxicity Reduction Evaluation workplan initiation has been triggered on a few occasions at POM-RA as the result of observed toxicity but specific causes of the sporadic toxicity has not been identified. However, diazinon quantification conducted (using both enzyme-linked immuno-sorbent assays (ELISA) and EPA method 8141) revealed elevated levels of diazinon in the receiving water but not in the Pomona WRP effluent on at least one occasion.

San Gabriel River Reach 1

A total of 121 valid chronic toxicity tests were conducted with samples collected from four receiving water stations in Reach 1 of the San Gabriel River. Receiving water stations R2 and R3-1 are located downstream of a discharge point for the San Jose Creek WRP and upstream of the discharge point for the Los Coyotes WRP. Stations R4 and R9W are located downstream of the discharge point for the Los Coyotes WRP. Effects greater than 25% were observed in only three tests with statistically significant effects observed in six of the 121 tests. A summary of these results is contained in Table B.7. No consistent toxicity was observed in this reach.

Coyote Creek

A total of 66 valid chronic toxicity tests were conducted with samples collected from three receiving water stations in the lower portion of Coyote Creek. Receiving water station RA1 is located upstream of the discharge from Long Beach WRP and stations RA and R9E are located downstream of the discharge. Effects greater than 25% were observed in 15 of the 66 tests with statistically significant effects observed in 19 of the tests. Toxicity in the lower portion of Coyote Creek was observed much more frequently prior to January 2005 with only two of the 27 tests conducted in or after January 2005 exhibiting effects greater than 25%. Most of the toxicity observed at these stations has been attributed to sources upstream of the Long Beach WRP. A summary of these results is contained in Table B.8.

Monthly median and weekly accelerated testing was conducted at station RA on several occasions. Since the source of toxicity appeared to be coming from above the Long Beach WRP discharge (as evidenced

by the observed toxicity at the upstream station RA1), concurrent testing was also conducted at RA1. In most cases, the concurrent upstream testing confirmed that the source of toxicity was originating above the WRP discharge. The nature of the toxicity has not been determined.

Table B.5. Summary of NPDES chronic tests for Reach 3 of San Gabriel River.[2]

Month/Year Tested	Location	
	R11	WN-RA
August 2003	- -	ns
October 2003	S[1]	ns
November 2003	-	-
February 2004	L[1]	ns
March 2004	ns	-
May 2004	- -	ns
August 2004	- -	-
November 2004	-	ns
March 2005	-	-
May 2005	-[1]	- -
August 2005	-	-
November 2005	-	-
February 2006	-	-
March 2006	ns	-
May 2006	-	-

- not toxic; effect less than 25%.
S = sub-lethal (reproduction or growth) effect greater than 25%.
L = lethal/survival effect of greater than 25%.
ns = not sampled.
[1] Statistically significant from control.
[2] More than one test was conducted in certain months; all resulted are reflected.

Table B.6. Summary of NPDES chronic tests for San Jose Creek Reach 1. [2]

Month/Year Tested	Location					
	POM-RA	POM-RC	POM-RD	C1	C2	
August 2003	ns	ns	ns	ns	-	
October 2003	ns	ns	ns	ns	-	
February 2004	ns	ns	ns	ns	-	
May 2004	ns	ns	ns	ns	-	
August 2004	-	-	-	-	-	
November 2004	L^1S^1	-	-	-	-	-
February 2005	S^1	$-^1$	S^1	S^1	-	-
March 2005	-	S^1	ns	ns	-	-
May 2005	ns		$-^1$	S^1	L^1S^1	-
August 2005	ns		$-^1$	-	-	-
November 2005	S^1	S^1	L^1S^1	L^1S^1	-	S^1
December 2005	L^1S^1	S^1	ns	ns	ns	ns
February 2006	-		-	L^1S^1	$-^1$	-
May 2006	-		-	-	L^1S^1	S^1 -

- not toxic; effect less than 25%.

S = sub-lethal (reproduction or growth) effect greater than 25%.

L = lethal/survival effect of greater than 25%.

ns = not sampled.

[1] Statistically significant from control.

[2] More than one test was conducted in certain months; all resulted are reflected.

Table B.7. Summary of NPDES chronic tests for Reach 1 of San Gabriel River.[2]

Month/Year Tested	R2	R3-1	R4	R9W
June 2003	ns	-	-	-
July 2003	ns	-	-	-
August 2003	ns	-	-	-
September 2003	ns	-	-	-
October 2003	ns	-	-	-
November 2003	ns	-	-	-
December 2003	ns	-	-	-
January 2004	ns	-	-	-
February 2004	ns	-	-	-
March 2004	ns	-	-	-
April 2004	ns	-	-	-
May 2004	ns	-	-	-
June 2004	ns	-	-	-
July 2004	ns	S[1]	-	-
August 2004	-	-	-	-
September 2004	ns	-	-	-
October 2004	ns	-	-	-
November 2004	-	-	-	-
December 2004	ns	-	-	-
January 2005	ns	-	-	-
February 2005	ns	-	ns	-
March 2005	-	-	- | -	-
April 2005	ns	-	-	-
May 2005	-	-	-	-
June 2005	ns	-	-	-
July 2005	ns	-	-	-
August 2005	-	-	-	-
September 2005	ns	-	-	-
October 2005	ns	-[1]	-	L[1]S[1]
November 2005	-	-[1]	-	-
December 2005	ns	-	-	-
January 2006	ns	-	-	-
February 2006	-	-	-	-
March 2006	ns	-	-	-
April 2006	ns	-	-[1] | - | -	-
May 2006	-	-	-	-
June 2006	ns	-	-	S[1]

- not toxic; effect less than 25%.
S = sub-lethal (reproduction or growth) effect greater than 25%.
L = lethal/survival effect of greater than 25%.
ns = not sampled.
[1] Statistically significant from control.
[2] More than one test was conducted in certain months; all resulted are reflected.

Table B.8. Summary of NPDES chronic tests for Coyote Creek.[2]

Month/Year Tested	Location											
	RA1				RA						R9E	
July 2003	L[1]S[1]				L[1]S[1]						L[1]S[1]	
October 2003	-				-						-	
January 2004	-				-						-	
April 2004	-				-						-	
July 2004	L[1]S[1]				-[1]		-		L[1]S[1]		S[1]	
August 2004	L[1]S[1]		L[1]S[1]		L[1]S[1]		S[1]		-		S[1]	ns
October 2004	-				-[1]						-	
November 2004	L[1]S[1]		-		-		-		-		-	ns
December 2004	-	-	-	-[1]	-	-	L[1]S[1]		-		ns	
January 2005	S[1]		-		-		-				-	
February 2005	-	-[1]		-	-		-		-		ns	
April 2005	-				-						-	
July 2005	ns				Ns						-	
August 2005	L[1]				-						ns	
October 2005	-				-						ns	
November 2005	ns				Ns						-	
January 2006	-				-						-	
April 2006	-				-						-	

- not toxic; effect less than 25%.

S = sub-lethal (reproduction or growth) effect greater than 25%.

L = lethal/survival effect of greater than 25%.

ns = not sampled.

[1] Statistically significant from control.

[2] More than one test was conducted in certain months; all resulted are reflected.

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Governor

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TO: Tam Doduc, Chair
State Water Resources Control Board

FROM: Pamela C. Creedon
Executive Officer

DATE: 19 October 2006

SIGNATURE: Pamela C Creedon

SUBJECT: 2006 CLEAN WATER ACT SECTION 303(D) LIST

Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff appreciates the opportunity to comment on the State Water Resources Control Board's (State Water Board) "Proposed 2006 Clean Water Act Section 303(d) List of Water Quality Limited Segments".

We have been working with your staff for more than a year and a half during preparation of the 303(d) list and provided comments on the public draft released last year. We appreciate the changes your staff has made in response to a number of our comments. However, three fundamental policy issues have not been adequately addressed – 1) listing of exotic species; 2) temperature listings; and 3) delisting waters that are not attaining standards.

With respect to these issues, we believe the Central Valley Water Board should be given deference in interpretation of its water quality objectives. State Water Board staff is proposing listing decisions based on interpretations of water quality objectives that the Central Valley Water Board has never applied. We believe the Central Valley Water Board should first be given an opportunity to consider this information as part of its own deliberations, followed by State Water Board review, if necessary.

The potential impact of the State Water Board staff's approach to interpreting our objectives extends far beyond the 303(d) list. Interpretation of our objectives is central to how we establish waste discharge requirements and conditions in waivers and to how we evaluate compliance. A new approach to interpreting our surface water quality objectives, which appears to conflict with our past practices, can have a profound effect on many of our programs.

Since the data solicitation process for the next 303(d) list update is starting within weeks, we believe there is no harm in deferring judgment on these listings decisions until the next update. Such deference will allow the Central Valley Water Board to consider approaches to addressing exotic species, temperature, and delisting that are compatible with the listing policy and the Central Valley Water Board's other programs. However, if the State Water Board does not believe such deference is possible, we believe there are sound technical and policy

reasons not to move forward with the proposed temperature and exotic species listings and to list waters that are not attaining standards.

Exotic Species

The issue of greatest immediate concern is the proposed listing of "exotic" species in the Delta, San Joaquin River, and Cosumnes River, which are based on the presence of established non-native aquatic species and decline of native species. A State Water Board determination that established non-native species are pollutants does not have a clear legal foundation and could have a number of significant, unintended policy ramifications.

Established non-native species are not being maintained or propagated due to a discharge of waste. The legal basis for the Boards to regulate or limit the populations of established species is, therefore, unclear. The State Water Board's and Central Valley Water Board's water quality plans do not distinguish between protection of non-native versus native aquatic species (e.g. our water quality objectives protect aquatic life, not just native aquatic life). In fact, the Central Valley Water Board's Basin Plan explicitly defines the "WARM" migration and spawning beneficial uses by referring to two non-native fish species – striped bass and shad.

State Water Board staff has listed "exotic" or non-native species based on violation of the narrative toxicity objective. Staff's assertion that non-native species are a "toxic substance" causing violation of our toxicity objective suggests that non-native species need not be protected from pollutant discharges. The precedent established is significant and would put both the Central Valley Water Board and State Water Board in conflict with our promulgated policies that either implicitly or explicitly protect non-native species.

Additionally, a number of unintended consequences are suggested by a listing of "exotic" species. Mosquito control districts may now be required to have WDRs or a waiver in order to plant or "discharge" mosquito fish – a non-native species that provides important biological control of mosquitoes. NPDES dischargers (treatment plants and storm water) may be required to conduct extensive monitoring programs to evaluate their "reasonable potential" for discharging exotic species. The lack of a clear definition of what constitutes an exotic species and the lack of a State policy to address exotic species will lead to a great deal of confusion and wasted resources in trying to determine how to incorporate regulation of exotic species into many of our programs. We suggest that the State Water Board defer listing exotic species until a clear basis for doing so is established in a State-wide or regional policy.

Temperature

In addition to the exotic species issue, Central Valley Water Board staff would like the State Water Board to reconsider listing temperature based on exceedance of an annual maximum temperature and comparison to fishery conditions that existed fifty to one hundred years ago (the listings are for the North Fork of the Feather River and Willow Creek in Madera County). Given our hot summers, it is not clear that the annual maximum temperature criterion used by State Water Board staff was met historically in our lower elevation waters. The scientific basis for using an annual maximum temperature criterion based on conditions in Washington state streams has not been established. Temperature criteria that are relevant for California conditions and account for natural seasonal and diurnal variations should be developed prior to listing.

Elevated temperature may contribute to declines in cold-water fish species. However, as your staff acknowledges, hydromodification, flow changes, and habitat alteration could be primary or contributing causes of the observed declines.

The challenge in evaluating temperature on a watershed scale is the lack of a clear water quality objective. Our temperature objective states "The *natural* receiving water temperature...shall not be altered unless it can be demonstrated to the satisfaction of the *Regional Water Board* that such alteration in temperature does not adversely affect beneficial uses" [emphasis added]. The objective goes on to state "...appropriate averaging periods may be applied provided that beneficial uses will be fully protected. The key issues are: 1) identifying the baseline that defines "natural" – pre-Basin Plan, pre-dams and hydropower; 2) the Central Valley Water Board's role in determining whether beneficial uses have been adversely affected by temperature alteration; and 3) defining the appropriate averaging period.

Use of an annual maximum temperature value, in which no averaging is considered, and use of a fishery resource baseline of 50-100 years ago sets a precedent for listing hundreds of Central Valley waters. Absent clear definition by the Central Valley Water Board of the appropriate temperature criteria, averaging period, and fishery baseline, such listings are premature.

<u>De-listing Waters not Attaining Standards</u>

We are also concerned that the State Water Board is proposing to de-list waters that have not yet attained water quality standards. Although the binomial method in the Listing Policy suggests de-listing, the "weight of evidence" from a review of the data and the applicable criteria suggests continued exceedances in a number of our water bodies. Specifically, data that have been determined to be of high quality indicate that applicable criteria are exceeded at a frequency of greater than once every three years (the allowable frequency for toxic pollutants).

In their response to comments, State Water Board staff stated that the one in three year exceedance rate was considered as part of the Listing Policy and the binomial method provides a "fair determination of when standards are met or not." Since the data clearly indicate the standard is not yet attained in several cases, the waters and associated pollutants should remain on the 303(d) list. The Listing Policy allows use of the binomial method or using the "weight of evidence" to evaluate data. In these cases, the binomial method provides a false conclusion regarding attainment of standards.

In addition, when diazinon and chlorpyrifos co-occur, the joint toxicity of those chemicals must be considered. However, the proposed 303(d) list does not consider additive toxicity. In previous comments, we provided staff with the analysis and data demonstrating co-occurrence of these chemicals and exceedance of our toxicity objective.

De-listing waters that are not attaining our water quality objectives would confuse the public as to what the 303(d) list represents. Based on our evaluation of the high quality data available, additive toxicity concerns, and the relevant criteria, the following water bodies should remain on the 303(d) list as not meeting standards for diazinon: Sacramento River, Feather River, and Morrison Creek for diazinon.

If the State Water Board moves forward with the exotic species and temperature listings, we request that the attached language be added to the resolution. We believe this language is necessary to clarify the basis for the listings.

I appreciate your attention to our concerns and look forward to discussing them with the Board at your upcoming hearing. I can be reached at (916) 464-4839.

Attachments – Proposed Resolution Language
Additional Comments on the 303(d) List and Response to Comments

cc: Celeste Cantu, SWRCB
Tom Howard, SWRCB
Craig Wilson, SWRCB
Song Her, SWRCB
Central Valley Water Board members

Attachment 1 - Proposed Resolution Language for the adoption of the 2006 Clean Water Act Section 303(d) List

As discussed in the main body of the comment letter, Central Valley Water Board staff recommends that the State Water Board not move forward with the proposed temperature and exotic species listings. However, should the State Water Board adopt the listings, we recommend the following findings be included in the adoption resolution.

Whereas,

1. The listing of "exotic" species in the Delta, Cosumnes River, and San Joaquin River is based on the presence "non-native" aquatic species, which are specifically identified in the record. The basis for the listings does not include any evidence that the presence of these non-native species is due to on-going discharges of waste.
2. Although non-native species can impact the diversity and abundance of native species, other factors that may be the primary or secondary cause of native species decline include habitat alteration, flow changes, or hydromodification.
3. The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan) does not establish different levels of protection for native versus non-native aquatic species. Both native and non-native aquatic species are part of the freshwater habitat ecosystem beneficial use definitions. The Basin Plan does not include water quality objectives that prohibit or limit the presence of established non-native aquatic species.
4. The Central Valley Water Board may need to protect non-native species from pollutant impacts to comply with federal and State laws.
5. The State Water Board's Listing Policy does not identify procedures for the listing of "exotic" species.
6. The listings for "temperature" as impairing the North Fork of the Feather River and Willow Creek (Madera County) are based on an evaluation of changes in cold-water fish populations over a period of approximately fifty to one hundred years. During that time, the State has developed or approved projects that have significantly altered the hydrologic characteristics of those waterways. The basis for these listings does not include any evidence that temperature increases are due to an ongoing discharge of waste.
7. The State Water Board has the authority to address elevated temperatures due to hydropower and reservoir operations.
8. Although temperature increases can impact the diversity and abundance of cold-water fish species, other factors that may be the primary or secondary cause of the decline in cold-water fish species include habitat alteration, flow changes, sedimentation, hydromodification or the introduction of non-native species.
9. The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan) does not include a specific temperature objective for the waters proposed for listing nor does the Basin Plan define the baseline for identifying the natural receiving temperature (e.g., pre-European settlement, pre-Basin Plan).

Therefore be it resolved,

1. The State Water Board does not expect the Central Valley Water Board to develop control programs to address the presence of established non-native species.
2. The State Water Board expects the Central Valley Water Board to continue to protect non-native aquatic species to the extent required by State and federal law.

3. The State Water Board directs staff to propose changes to the Listing Policy to identify the beneficial uses, water quality objectives, and evaluation procedures that should be used to list and de-list waters impaired by "exotic" species. The proposed changes should be presented for State Water Board consideration prior to the 2010 update of the Clean Water Act 303(d) list.
4. The State Water Board does not expect the Central Valley Water Board to develop control programs to address temperature listings in the North Fork of the Feather River and Willow Creek (Madera County).
5. The State Water Board directs staff to work with Central Valley Water Board staff to develop a work plan and identify the resources needed to review and potentially revise the temperature provisions of the Central Valley Water Board's Water Quality Control Plans.

Central Valley Water Board staff have reviewed the State Water Board Response to Comments (SWRCB, 2006a) (Response) and the Proposed 2006 CWA Section 303(d) List of Water Quality Limited Segments (SWRCB, 2006b) (Proposed 303(d) List). We have noted several instances in which the stated change in the State Water Board's response is not reflected in the Proposed 303(d) List. The Comments and State Water Board's Responses are presented in the same table format that the State Water Board used for their Responses to Comments. The Central Valley Water Board staff's review and recommendations follow each Comment/Response pair in plain text format.

Comment Nos. 14.114.3, 14.2,26.1, 26.3, 26.5,26.6, 26.2, 37.1,37.2, 78.1,222.1, 222.5 (Page 107)

Central Valley Water Board staff appreciates the response indicating that the stressor and source information would be changed. The recommendations for the Fall River listings included removing "agricultural grazing" and "Highway/Road/Bridge construction" from the "Potential Sources" in the Proposed 303(d) List. These two Potential Sources are still included in the Proposed 303(d) List and should be removed. In addition, the "Potential Sources" description should replace ",and natural catastrophic events" with "(i.e., logging, grazing, channelization, roads, and railroads) and natural catastrophic events (i.e., fire)." (see attachment letter in Landau, 2006, from J.C. Pedri to J. Karkoski dated 23 November 2005). This reference also recommends that the "Pollutant/Stressor" be changed from "Sedimentation/Siltation" to "Sedimentation (i.e., accumulated sand size sediment in upper Fall River)."

Comment Nos. 131.29, 131.46, 131.47, 131.55 (Pages 118, 120, 121)

Central Valley Water Board staff appreciates the response indicating that the specific pyrethroids would be identified on the 303(d) list. However, the State Water Board did not add a notation to the Proposed 303(d) List listing bifenthrin, lambda cyhalothrin, esfenvalerate/fenvalerate, and permethrin as "Pollutants of Concern". We request that this oversight be corrected prior to submittal of the list to the U.S. EPA.

Comment Number 131.59 (Page 122)

The State Water Board did not respond to what is identified as the second part of the comment. The Central Valley Water Board made the following comment: "Note that we are not suggesting that non-native species should not be addressed. Rather than a 303(d) listing, we suggest that the State Water Board embark on a more deliberative process to identify: 1) the potential scope of the problem; 2) the regulatory authorities and agencies that are or could be involved in the regulation of non-native species populations; 3) the water quality policies that would need to be developed for the Water Boards to regulate non-native species; 4) the potential consequences, impacts, and benefits of regulating the populations of established non-native species."

We ask that the State Water Board consider the recommendation to evaluate the non-native species issue outside of the 303(d) listing process.

Comment Nos. 131.12, 216.3, 216.4; 131.7 (Pages 116, 123)
The State Water Board states in their response "None of the exotic species listings are based on the species mentioned in the comment letter." This statement is not accurate. The fact sheet names "American shad" as a planted fish species and "striped bass" as an introduced fish species under one "Line of Evidence" in the "Data Used to Assess Water Quality" sections of its eight Fact Sheets (for eight portions of the Delta Waterways) that propose listing these waterbodies for "exotic species". These two fish species are also named in the comment letter as being non-native fish that are specifically associated in the Regional Water Board's Basin Plan with the definition of the WARM migration and spawning beneficial uses.

Similarly, "mosquitofish" were named (with at least seven other fish species) as "non-native" species under one "Line of Evidence" in the "Data Used to Assess Water Quality" section of the Fact Sheets for the "San Joaquin River (Friant Dam to Mendota Pool)" that propose listing this waterbody for "exotic species". Mosquitofish are also named in the comment letter as being non-native fish that are specifically associated in the Regional Water Board's Basin Plan with the definition of the WARM migration and spawning beneficial uses.

Central Valley Water Board staff request that the inaccurate statement be deleted from the response to comments.

Additional Recommended Changes/Corrections to the 303(d) List
Exotic Species Listings – Should the State Water Board move forward with the recommended listing, we request that the species causing the impairment be identified in the remarks associated with the listing. We also request that "Sources Unknown" be changed to "Established non-native species – no known 'discharge'."

North Fork Feather River, Temperature – Should the State Water Board move forward with the recommended listing, we request that "Sources Unknown" be changed under Potential Sources be changed to "Hydromodification/Flow Changes". We believe this change would accurately represent the understanding of the State Water Board's Division of Water Rights with respect to the cause of elevated temperatures.

Orestimba Creek, Azinphos Methyl – We recommend that the word "Guthion" be removed from the azinphos methyl listing. "Guthion" is the brand name of a specific pesticide product containing azinphos methyl. There may be other pesticide products with different brand names containing azinphos methyl.

Main Drainage Canal, Wadsworth Canal, Diazinon – We recommend that the potential source be changed from "Sources Unknown" to "Agriculture". The Main Drainage Canal and Wadsworth canal is surrounded by agriculture and diazinon is currently only being sold for agricultural uses.

Water Quality Limited Segments being addressed by USEPA approved TMDLs
There are a number of water bodies identified as being addressed by USEPA approved TMDLs that have not yet been approved by USEPA. Most of the waters have TMDLs that have been at least approved by the Central Valley Water Board and two of the listings have no TMDLs yet.

TMDLs in the approval process – Cache Creek, mercury (includes Bear Creek, Cache Creek, and Harley Gulch); Delta Waterways, diazinon/chlorpyrifos (includes all Delta waterways segments plus lower Calaveras River, Five Mile Slough, Mosher Slough, Smith Canal); San Joaquin River, diazinon/chlorpyrifos.

No TMDL yet adopted by the Central Valley Water Board – San Joaquin River (Mud Slough to Merced River), selenium; Sulphur Creek, mercury.

Corrections to Fact Sheets

Sacramento River/Feather River, Diazinon – the diazinon evaluation criteria used by the State Water Board staff were the corrected Department of Fish and Game criteria (0.160 ug/L as a one-hour average and 0.100 ug/L as a 4-day average). The Central Valley Water Board has adopted and the U.S. EPA has approved diazinon water quality objectives for the Sacramento and Feather Rivers. Those objectives are 0.080 ug/L as a one-hour average and 0.050 ug/L as a 4-day average and should be used to evaluate attainment of standards.

References

Landau, K.D. 2006. *Comments On The Proposed Revision To Federal Clean Water Act Section 303(D) List Of Water Quality Limited Segments For California (303(D) List).* Letter to Selica Potter, Acting Clerk of the [State Water] Board from Ken Landau, Acting Executive Officer of the Regional Water Board. 24 January 2006. Sacramento, CA.

SWRCB (State Water Resources Control Board, Division of Water Quality). 2006a. *Revision of the Clean Water Act Section 303(d) List of Water Quality Limited Segments, Responses to Comments.* Staff Report Volume IV, Table 2 (Staff Report, Volume III, Central Valley Region Fact Sheets). September 2006. Sacramento, CA.

SWRCB (State Water Resources Control Board). 2006b. *Proposed 2006 CWA Section 303(d) List Of Water Quality Limited Segments, Central Valley Regional Board.* SWRCB Draft 303(d) List release date: September 15, 2006.

SWRCB (State Water Resources Control Board). 2006c. *Proposed 2006 CWA Section 303(d) List Of Water Quality Limited Segments.* SWRCB Draft 303(d) List release date: September 15, 2006. Sacramento, CA.

SWRCB (State Water Resources Control Board, Division of Water Quality). 2006d. *Revision of the Clean Water Act Section 303(d) List of Water Quality Limited Segments, Water Body Fact Sheets Supporting the Listing and Delisting Recommendations.* Staff Report Volume III, New or Revised Fact Sheets. September 2006. Sacramento, CA.

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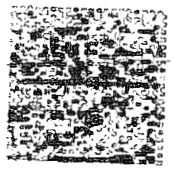

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