APPENDIX D
COMMENTS AND RESPONSES

Comments received by the Clerk to the Board by 12:00 pm March 15, 2011 are organized by subject/issue. Subjects are listed below followed by a table listing author and affiliation. The State Water Resources Control Board (Board) staff has prepared responses to the significant environmental issues raised concerning the substitute environmental documentation and amendments proposed for the Boards consideration.

- Chemical List – Attachment A
- Chemical Score Index
- Comment Period and Public Hearing
- Ecological Risk Assessment
- Economic Impacts
- Fish and Wildlife SQOs
- Implementation – General
- Responsiveness
- Supersession
- Comments Outside of Scope

AFFILIATION	PRIMARY AUTHOR	ABBREVIATION
California Sportfishing Protection Alliance	Bill Jennings	CSPA
City of Los Angeles Bureau of Sanitation	Shahram Kharaghani	LABS
City of San Diego, Transportation & Storm Water Department	Kris McFadden	SDSW
General Public	Joyce Dillard	Dillard
General Public	Jon Olson	Olson
General Public	G. Fred Lee (2 comments) Anna Jones-Lee	GFL2
Heal the Bay	Kirsten James Mark Gold	HTB
Latham & Watkins on behalf of: General Dynamics National Steel and Shipbuilding	Kelly Richardson	L&W1
Latham & Watkins on behalf of: American Council of Engineering Companies California Building Industry Legal Defense Foundation California Building Industry Association California Business Properties Association California Chamber of Commerce Construction Industry Coalition on Water Quality Southern California Contractors Association	Paul Singarella	L&W2
Orange County Sanitation District	James Colston	OCSD
San Francisco Baykeeper	Ian Wren	SFBKR

CHEMICAL LIST – ATTACHMENT A

Comment 1 - The proposed amendments also include substantive changes to the list of chemical analytes needed to characterize sediments, without any corresponding explanation as to why such changes are now proposed. Most notably, in the proposed amendments to Attachment A of the SQOs, there are substantive changes to the list of PCB congeners needed to characterize sediments. Three PCB congeners are proposed for deletion from the list

2,2',3,3',4,4'5-heptachlorobiphenyl, 2,2'3,3'4,4',5,5',6-nonachlorobiphenyl, and decachlorobiphenyl), while a single new PCB congener, 2,3,3'4',6-pentachlorobiphenol, is proposed to be added. These proposed changes represent a significant change in the list of PCN congeners and the resultant total PCB concentration that will be considered in an SQO assessment. Further, these changes in congeners are also being proposed with out any corresponding proposed changes to the total PCB category score concentration ranges presented in Table 6. As is the case for proposed amendments to the category score concentration ranges, the document presents no rational for these significant changes to the PCB congener list. Moreover, a review of the SQO backup materials posted on the SCCWRP website reveals no corresponding changes in the PCB congener list for SQO assessment. (L&W1)
Response – Staff is still evaluating this comment, and has therefore postponed Board consideration of this proposed amendment to a future date.

Comment 2 - Corrections to the chemical list described in Part 1, Attachment A are proposed in this amendment. Based upon review of U.S. Environmental Protection Agency's (EPA) document (EPA/600/P-96/001F) *PCBs: Cancer Dose - Response Assessment and Application to Environmental Mixtures, Table 3-3*, it appears that some congeners in Attachment A are not consistent. Six congeners listed in Attachment A were not listed in the EPA document; however, another six congeners listed in the EPA document only differed by one digit. For example 2,3,4,2',4',5'-hexachlorobiphenyl was not listed in the EPA document, but 2,3,4,3',4',5'-hexachlorobiphenyl was listed as Not Abundant in Environmental Samples, but Toxicologically Active category. To ensure consistent implementation, we recommend verifying the congeners between the SQOs, the EPA document, and the SCCWRP 2009 Draft Technical Support Manual. (SDSW)
Response – Staff is still evaluating this comment, and has therefore postponed Board consideration of this proposed amendment to a future date.

CHEMICAL SCORE INDEX

Comment 3 - The proposed changes to the chemical score index (CSI) metric in the chemical line of evidence in an effort to correct a blatant error underscores the lack of review given the chemical line of evidence before it was previously brought before the Board. More importantly, this change to the chemical line of evidence fails to address the primary flaws of the chemical line of evidence previously adopted. Not only does it ignore the fact that abstract statistical correlations, gradient analysis and co-occurrence based sediment quality approaches are scientifically unreliable; it fails to consider and indeed seems to preclude information on the presence of all but a very limited number of pollutants. This omission is especially glaring considering the fact that SCCWRPs own research is highlighting that currently used pesticides are an important toxicant in enclosed bays and estuaries. It also ignores the fact that ammonia and nutrient-caused low dissolved oxygen have been identified as among the most significant causes of sediment toxicity in the environment. These facts underscore the need for fundamental changes to the direct effects SQOs, as we stated in our comments on potential amendments to the 303(d) listing policy. (CSPA)
Response - Staff is still evaluating this comment, and has therefore postponed Board consideration of this proposed amendment to a future date.

Comment 4 - Another significant error in developing the current SQOs Plan is the use of the "Chemical Score Index" and the "California Logistic Regression Model" approaches that are simply mathematical manipulations of total concentrations of selected sediment-associated contaminants. While those approaches give the appearance of reliability in correlating the total

concentration of a chemical and sediment toxicity than the ERM/PEL approaches, they are in fact rooted in what is known to be an unfounded assumption, namely that there is a quantitative and causative relationship between the total concentration of a chemical and sediment toxicity. The Board staff has stated that it understands that such approaches can err in identifying impaired sediment and causes of sediment toxicity, but claims that such inherent unreliability in the approaches can be corrected by using the pollutant identification approaches listed in the SQO Part 1. That position is not technically defensible; perpetuation of the application of technically unreliable evaluation and management instruments will continue to result in unreliable and wasteful evaluation and "management" of sediments. As discussed in our comments on the then proposed SQOs Part 1, several of the proposed Pollutant Identifications approaches are also not technically valid for identification of the true cause of sediment toxicity. Because of their inherit unreliability for this purpose, total contaminant concentrations should be eliminated from the SQO protocols used to evaluate "sediment quality" and sediment toxicity. Instead, narrative SQOs based on direct measurement of toxicity should be used as the primary tool for assessing sediment quality with respect to toxicity to aquatic life. (GFL)
Response – Staff is still evaluating this comment, and has therefore postponed Board consideration of this proposed amendment to a future date.

Comment 5 - With regard to the CSI ranges presented in Table 6, it appears that some of the indicated changes may in fact represent corrections to previous typographical errors (e.g. revisions to the ranges for zinc and total high PAH). However, General Dynamics (GD) and National Steel and Shipbuilding Company (NASSCO) are concerned that the proposed amendments also include significant changes to the concentration ranges for DDDs, DDEs, and DDTs without providing any explanation of the rationale behind the proposed changes or the effects of the proposed changes on the SQO process. For example, the proposed reference concentration range for DDEs increases from $\leq$ 0.50 ug/kg to < 1.19 ug/kg. At the high category for DDEs, the range decreases from > 154 ug/kg to 45.84 ug/kg, a 70% reduction in the specified concentration range. Changes of similar magnitude are proposed for DDDs and DDTs. It is clear that these proposed changes are neither minor corrections nor are they simply corrections to typographical errors. In addition, the proposed weight factors (Table 6) for all three substances change from previous values, with the weight for DDTs increasing from 16 to 20, potentially producing a significant effect on the influence of DDTs on the resultant CSI score. Yet the proposed changes are presented in the subject document as "minor", "non-substantive" corrections to omissions and typographical errors," without any explanation of the rational behind the proposed changes or the effects of the proposed changes on the SQO process. (L&W1)
Response - Staff is still evaluating this comment, and has therefore postponed Board consideration of this proposed amendment to a future date.

Comment 6 - The proposed change to zinc renders the distinction between category 1("reference") and category 2 ("low") to be ambiguous to the extent that the revision results in an overlap between category 1 described as $\leq$ 113 ug/kg and category 2 (described as > 112 ug/kg). (L&W1)
Response - Staff is still evaluating this comment, and has therefore postponed Board consideration of this proposed amendment to a future date.

Comment 7 - Our organizations support and encourage the SWB' s efforts in developing sediment quality objectives and related implementation policies in the Bays and Estuaries Plan that are protective of benthic invertebrates, fish and wildlife, and human health. However, we believe the proposed amendments to the Bays and Estuaries Plan are not consistent with the Board's stated objectives, and, instead, propose excessively low concentrations for certain

compounds which have no rational basis in science and do not correspond to any identifiable decrease in risk (L&W2).
Response - Staff is still evaluating this comment, and has therefore postponed Board consideration of this proposed amendment to a future date.

Comment 8 - We have serious concerns with the Board's proposed amendments to the Chemical Score Index ("CSI") because these amendments are contrary to real-world, scientifically-observed conditions. The proposed amendments also increase the risk that Regional Water Quality Control Boards may misuse concentration ranges by extracting these values from the Bays and Estuaries Plan and using them in an inappropriate manner to establish cleanup levels, in contravention of the integrated, multi-step process set forth in the Bays and Estuaries Plan. Indeed, staff for one such Regional Board already has done just this, as demonstrated by the California Regional Water Quality Control Board, Los Angeles Region's ("RWB") recent draft Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters total maximum daily load for toxic pollutants ("the Draft TMDL"). Accordingly, we request that the SWB revise its proposed amendments to be consistent with good science (L&W2).
Response - Staff is still evaluating this comment, and has therefore postponed Board consideration of this proposed amendment to a future date.

Comment 9 - Proposed CSI amendments for DDT are not scientifically based. Benthic organisms are not affected by DDT, even at levels hundreds of times higher than those in the current or proposed CSI. The proposed amendments to the Bays and Estuaries Plan would lower the category score concentration ranges for the CSI for DDE, DDT, and DDD. Under these amendments, the "high disturbance" thresholds for DDE, DDT, and DDD would be lowered from 154, 89.3, and 117 ug/kg, respectively, to 45.84, 34.27, and 26.37 ug/kg respectively. In addition, the DDE, DDT, and DDD values for the moderate, low, and reference disturbance categories would also change, as would the weighting factors. These proposed amendments to the DDE, DDT, and DDD thresholds in the Bays and Estuaries Plan are unnecessary because the current thresholds are far too low in the first place, and do not correspond to any level of disturbance to benthic organisms. To be consistent with relevant published thresholds regarding potential effects of DDT on benthic organisms, the current CSI thresholds would need to be increased significantly - not lowered as proposed. There is a published no-observed-effect concentration ("NOEC") for total DDTs in the Southern California Bight of 8.51 mg/kg, or parts per million ("ppm") (equivalent to 8,510 ug/kg, or parts per billion ("ppb,,)). A NOEC is the concentration below which there is no observed harm to the organisms at issue. This NOEC level indicates that DDT does not represent a threat to the benthic community at ambient levels prevalent throughout most of the water bodies to which the Bays and Estuaries Plan applies. It is based on samples collected in 1994, and, since that time, DDT in the Southern California Bight has further aged, weathered, and been subject to other processes that would tend to make it less bioavailable. Thus, the NOEC today reasonably can be expected to be significantly greater than 8,510 ppb. The published 8.51 mg/kg value corresponds to the concentration below which there were no observed effects on organisms in 1994, yet it is *hundreds of times greater* than the values currently in the CSI "disturbance" table and those proposed for the amended "disturbance" table. There is no scientific or evidentiary basis for SWB to conclude that sediment in bays and estuaries is in any way "disturbed" by DDT at levels below 8.51 mg/kg. We respectfully request that SWB set the threshold for "low disturbance" above 8.51 mg/kg, and that the moderate and high disturbance category scores are set even higher. (L&W2)
Response – Staff is still evaluating this comment, and has therefore postponed Board consideration of this proposed amendment to a future date.

Comment 10 - DDT is not a risk to people; any threshold concentration based on protecting human health should be raised, not lowered. The Board's legislative mandate to promulgate the Bays and Estuaries Plan states that the Bays and Estuaries Plan should be geared towards protecting against any health risk from the exposure of humans to pollutants through the food chain to edible fish, shell fish, or wildlife. As such, the threshold values for pollutants in the Bays and Estuaries Plan should be based on values that pose a health risk to humans. As relevant here, this has not been done for DDT, as DDT does not present a risk to human health. Numerous published studies have shown that DDT does not pose a risk to human health. In fact, discovery of DDT's insecticidal properties won Dr. Paul Mueller, the discoverer, the Nobel Prize in Physiology or Medicine in 1948.7 These insecticidal properties have been used to improve human health throughout the world by saving lives that would otherwise be lost to malaria. Multiple studies have demonstrated that there is a lack of connection between DDT and various cancers. Because DDT does not have adverse impacts on human health, any threshold value which is used in a process designed to protect human health should be raised from the current values, not lowered as contemplated by the proposed Bays and Estuaries Plan amendments to the CSI thresholds. (L&W2)
Response – Staff is still evaluating this comment, and has therefore postponed Board consideration of this proposed amendment to a future date.

Comment 11 - The following comments refer to typographical errors and omissions. The Draft Staff Report Substitute Environmental Document for Proposed Amendments to the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality for the Protection of Fish and Wildlife, Section 1.1 states that "corrections to PAHs, DDD, DDE, and DDT values applied to the Chemical Index Score contained in Table 7 of Part 1." The table referred to is actually Table 6 in Appendix A. Please update the text. Additionally, changes were also made to Zinc in the referenced table, which need to be updated accordingly. If this amendment is meant to rectify either typographical errors or omissions, it is not clear why changes to the Disturbance Categories were made. The existing Disturbance Categories matched the Southern California Coastal Water Research Project (SCCWRP) 2009 Report entitled "Sediment Quality Assessment Draft Technical Support Manual" (Draft Technical Support Manual). Please provide the rationale for revision of the Disturbance Categories, or provide a reference where the information explaining the revision can be found. (SDSW).
Response - Staff is still evaluating this comment, and has therefore postponed Board consideration of this proposed amendment to a future date.

Comment 12 - Part 1 provides a methodology for assessing benthic community structure health. It specifically states that the policy does not provide clean up numeric levels or recommended mitigation measures. "The chemistry LOE of Section V.H.2, including the threshold values (e.g. CSI and CALRM), shall not be used for setting cleanup levels or numeric values for technical TMDLs." If the SQO analysis has determined there to be an impairment for an area, the policy provides guidance on the necessary step of conducting a causation study to determine the chemical component/s creating that impairment. Once the specific chemical or suite of chemicals have been determined, then a waste load allocation can be assessed. The SQO policy has provided a clear set of tools and specific guidance on how to assess the chemical constituents of concern. Skipping this step and pulling numbers from the policy chemistry tables for waste load allocations is inappropriate and not helpful to protecting and cleaning up the environment that has been impacted (OCSD).
Response - Staff is still evaluating this comment, and has therefore postponed Board consideration of this proposed amendment to a future date.

Comment 13 - The proposed amendments to the CSI disturbance table increase the risk of misuse by Regional Boards. The Bays and Estuaries Plan is an integrated policy, where all steps are required to assess sediment quality. The Bays and Estuaries Plan makes it clear that no single line of evidence ("LOE") is a sufficient tool to assess sediment quality when used alone because no "individual LOE is sufficiently reliable when used alone to assess sediment quality impacts due to toxic pollutants. Additionally, the Bays and Estuaries Plan states that "the chemistry LOE ... shall not be used for setting cleanup levels or numeric values for technical TMDLs." It is clear that the Bays and Estuaries Plan requires the use of an integrated, multi-step process, including the use of the MLOE and step-wise processes, where each step is completed and all three of the LOEs are used concurrently to assess sediment quality. Unfortunately, this is not what is happening at the Regional Board level. (L&W2)
Response - Staff is still evaluating this comment, and has therefore postponed Board consideration of this proposed amendment to a future date.

COMMENT PERIOD AND PUBLIC HEARING

Comment 14 - Because the proposed changes to the chemical score index and the list of PCB congeners represent significant, substantive changes that require technical rational and justification, the Board should postpone the public hearing on these revisions until supporting information can be provided and extend the comment period at least thirty days from the date such backup materials are provided in order to allow GD and NASSCO and other interested parties sufficient time to review and comment knowledgeably on the same. (L&W1)
Response - Staff has decided to postpone Board consideration of this proposed amendment to a future date.

ECOLOGICAL RISK ASSESSMENT

Comment 15 - Specifying that the narrative fish and wildlife objective must be implemented through an ecological risk assessment is unnecessary, needlessly expensive and unreasonably burdensome. Such an approach will likely hinder timely protections being implemented. Laboratory testing confirming sediment toxicity is in itself sufficient to show sediments to be toxic and exceeding the narrative objective. The revised SQOs would in many cases be less protective than the existing narrative standards and implementation provisions (CPSA).
Response – The ecological risk assessment (ERA) has undergone extensive peer review by U.S. EPA, (EPA, 1996) and others (Suter, et al, 2003) and has been applied to a variety of situations including watershed management and evaluation of beneficial use protection (U.S. EPA 2008). Staff believes the use of ERA is a useful implementation tool because it is flexible and can be tailored to the specific site or waterbody conditions, receptors, and exposure pathways present at any site. will provide greater consistency and transparency among each regional board. Preliminary ERAs are performed with existing data and information coupled with conservative assumptions to address areas of uncertainty so in that regards significant expense is unlikely. The ERA process is also iterative; where an unacceptable risk is likely to be present but significant uncertainty remains, then additional data can be collected or alternative resources can be focused on addressing the problem directly. The commenter states that laboratory testing is sufficient to show sediment toxicity, and is also more protective. While laboratory toxicity testing can be used to inform the ERA process, laboratory testing has many limitations, such as what receptors and exposure types can be addressed via those tests. Other types of data such as chemical concentrations in prey tissue or egg shells can be much more informative when dietary exposure is suspected. In regards to the ERA process being less protective than toxicity testing, the ERA process is frequently applied by state and federal agencies — e.g. U.S EPA, NOAA, USFWS, DFG, DTSC — to ensure that threatened and

endangered species are not harmed. The statement that toxicity testing is more protective for all potential receptors and exposures exaggerates the utility of laboratory toxicity tests, and completely ignores the limitations associated with test organisms, type and duration of exposure. Section 2.2 of the 2011 draft Staff Report presents a summary of ERA and important references. Finally, staff believes that the use of ERA will provide greater consistency and transparency among each of the regional boards.

Comment 16 - Sections VI.A and VI.B do not provide a concise process for evaluating human health and wildlife risk. If the intent of these sections is to confirm that the established process for evaluating human health and wildlife resident finfish risk will remain unchanged, please clearly state. If the guidance provided in this section deviates from the current human and wildlife health evaluation guidance, please provide more detail on how a case-by-case assessment would be implemented. For example, Section VI.A states that the "narrative human health objective…shall be implemented on a case-by-case basis, based upon a human health risk assessment." It is unclear which agency decides that a human health risk assessment must be conducted, or what criteria are considered when determining if a risk assessment must be conducted. (SDSW)

Response Ecological risk assessment is a process to collect, organize, and analyze scientific information in order to evaluate the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to one or more stressors (U.S. EPA, 1998). The process is adaptable to a wide variety of sites and may be site specific. The process for evaluating the risk is conducted using specific frameworks that follow explicit guidelines. ERA beings with problem formation and development of a detailed conceptual model that identifies all potential receptors at risk, important exposure pathways, sources, impacted media and contaminants of concern. Selection of appropriate indicators such as chemical concentration in prey species and relevant and appropriate values used in comparison would also be identified in the planning process. Addressing uncertainty is a significant component of all risk assessments and is addressed in both the planning stage and risk characterization phase. The State and Regional Water Boards are responsible for making such risk assessment decisions on a case-by-case basis, and will incorporate the SQO and appropriate implementation provisions where necessary. For example, a Regional Board would look at evidence of contaminant-related toxicity from field studies, or exposure to contaminants in prey species, or simply concerns associated with a site or discharge.

Comment 17 - An actual implementation strategy should be one based on scientific information and numeric indicators. It is not sufficient to state that implementation shall be carried out on a case-by-case basis and be informed by a list of random agencies that may or may not hold relevant information or expertise. Through a lengthy scientific review and stakeholder engagement process the State Board has funded the development of science-based indicators and tools which are in no way reflected in the Proposed Amendment. In your response to comments please indicate whether the implementation plan identified within the Proposed Amendment is in fact the final plan intended to satisfy Phase II goals and maintain compliance with relevant statute. In addition, please indicate the status of the scientific review process and whether the information developed to date shall be used to inform SQO development. (SFBKR)

Response – The ecological risk assessment (ERA) is a scientifically valid and peer reviewed process. ERA is a well-respected method of implementation and plays a significant role in RCRA and CERCLA actions, as well as CWA permitting. The agencies charged with implementing ERA are not random; these state and federal agencies are responsible for protecting natural resources. Water Code section 13304.2 requires ERA to assess contamination in brownfields, so the comment that ERA is inappropriate for assessing contamination in sediments is unfounded. In addition, staff has not abandoned its scientific

efforts to continue refining Part 1. Staff's efforts were merely redirected because of the current litigation and the obligation to meet the demands under the Second Supplemental Agreement. Staff intends to continue its scientific efforts with the appropriate funding and resources. All water quality control plans are subject to periodic review and revision under Water Code section 13240. The fact that the Board will continue to pursue scientific efforts to better refine Part 1 does not mean that the current proposed SQO and ERA amendments are not final. When the Board adopts a plan or policy, that action is final. As such, when the Board adopts the proposed SQO and ERA, the amendments will be considered final, which means final for the purposes of the Second Supplemental Agreement.

Comment 18 - Completing an ecological risk assessment at each monitoring location, as is suggested in the Amendments, is impractical and calls into question the merit of the SQOs themselves. (HTB)
Response - The ecological risk assessment (ERA) is practical and implementable. ERA is a scientifically valid and peer reviewed process to collect, organize, and analyze scientific information in order to evaluate the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to one or more stressors (U.S. EPA, 1998). The process for evaluating the risk is conducted using specific frameworks that follow explicit guidelines, and is also adaptable to a wide variety of sites. ERA beings with problem formation and development of a detailed conceptual model that identifies all potential receptors at risk, important exposure pathways, sources, impacted media and contaminants of concern. Selection of appropriate indicators such as chemical concentration in prey species and relevant and appropriate values used in comparison would also be identified in the planning process. Addressing uncertainty is a significant component of all risk assessments and is addressed in both the planning stage and risk characterization phase. ERA is a well-respected method of implementation and plays a significant role in RCRA and CERCLA actions. ERAs have also been applied to habitat restoration efforts and NPDES permits.

Comment 19 - While implementation procedures for the proposed objectives are included, the requirement to conduct an ecological risk assessment is not as clearly defined or prescriptive as the implementation procedures developed for the other sediment quality objectives. This lack of specificity will result in inconsistencies in the implementation of these objectives throughout the State, counter to the intent of the proposed amendments as stated in the Draft Staff Report. (LABS)
Response - Staff believes the use of ecological risk assessment (ERA) will provide greater consistency and transparency amongst the regions. ERA is practical and implementable. ERA is a scientifically valid and peer reviewed process to collect, organize, and analyze scientific information in order to evaluate the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to one or more stressors (U.S. EPA, 1998). The process for evaluating the risk is conducted using specific frameworks that follow explicit guidelines, and is also adaptable to a wide variety of sites. ERA beings with problem formation and development of a detailed conceptual model that identifies all potential receptors at risk, important exposure pathways, sources, impacted media and contaminants of concern. Selection of appropriate indicators such as chemical concentration in prey species and relevant and appropriate values used in comparison would also be identified in the planning process. Addressing uncertainty is a significant component of all risk assessments and is addressed in both the planning stage and risk characterization phase. ERA is a well-respected method of implementation and plays a significant role in RCRA and CERCLA actions. ERAs have also been applied to habitat restoration efforts and NPDES permits.

ECONOMIC IMPACTS

Comment 20 - Please do not make any of the proposed changes to the SQOs via any amendment unless the changes are to repeal the objectives in total. The proposed changes regarding SQOs when compared to the eventual economic impacts cannot be justified. (Olson)
Response – First, it is important to note that the Board is required to adopt SQOs pursuant to Water Code section 13393. Second, staff believes that the environmental benefits outweigh any costs associated with implementing the SQOs because the SQOs address pollutants that accumulate in sediment within enclosed bays and estuaries, and protect aquatic life, human health, and fish and wildlife.

FISH AND WILDLIFE SEDIMENT QUALITY OBJECTIVES

Comment 21 - As proposed, the draft narrative SQO is inadequate. State Board staff has indicated the narrative objectives contained in the Proposed Amendment qualify as final SQOs. However, given their inability to reasonably afford an adequate margin of safety or protect beneficial uses, the proposed SQO fails to satisfy the definition and objectives under Porter Cologne. No objective criteria are proposed to enable any person or agency to determine whether "[p]ollutants [are] present in sediment at levels that alone or in combination are toxic to wildlife and resident finfish…." This narrative standard will be the subject of constant uncertainty and controversy and cannot be relied upon to give effect to the Water Code's SQO mandates or satisfy the terms of the Second Supplemental Agreement. Moreover, the Board has not shown that a more workable, numeric, standard would be infeasible. Instead, the Board has apparently ignored the valuable input of the SQO Scientific Steering Committee. The proposed policy must be revised to provide a clear, objective, enforceable, and most likely numeric, standard for protection of wildlife and finfish. Within your response to comments please explain how the narrative objectives of the Part 1 SQOs satisfy the definition and objectives of SQOs, as found in the California Water Code. (SFBKR)
Response – Staff wholly disagrees. The proposed SQO for resident finfish and wildlife, and the ecological risk assessment implementation do satisfy the Board's obligation to adopt final SQOs under the terms of the Second Supplemental Agreement. In addition, the proposed SQO is consistent with Water Code section 13393. The objective is not meaningless; it is based on scientific information and is fully intended to protect the fish and wildlife receptors from toxicity in sediment. Staff understands that the commenter would like to see a numeric, or more prescriptive SQO. However, Water Code section 13393 does not require that SQOs be numeric; an SQO can be numeric or narrative as long as it is based on scientific information and is protective of the intended receptors. The proposed SQO is protective because it prevents harm to fish and wildlife by limiting toxic pollutants in sediment. If even the slightest concentration of toxic pollutants would be harmful, then the objective would be violated. In addition, the ecological risk assessment is a peer-reviewed process that has practical implementation. For example, if a discharge has the reasonable potential to exceed the SQO, then the regional board can apply the SQO as a receiving water limit. Consistent with its obligations to conduct periodic review of water quality control plans, Staff will continue to refine the SQOs if necessary, and if appropriate resources are available.

Comment 22 - State Board staff has indicated the narrative objectives contained in the Proposed Amendments serve to satisfy final SQO requirements. Yet, it is unclear whether the Board intends to claim that the proposed amendments satisfy its obligation under the Second Supplemental Agreement and Further Order to adopt SQOs for indirect effects on fish and wildlife. (SFBKR).
Response – When the Board adopts the proposed amendments, the SQO for resident finfish and wildlife will be final, because the action of adopting amendments to a water quality control

plan is considered final agency action, and they will be effective once approved by the Office of Administrative Law. The Board's adoption of the proposed amendments will satisfy its obligation under the Second Supplemental Agreement, because the Second Supplemental Agreement requires that all final SQOs be adopted and submitted to OAL by April 29, 2011. The Board fully intends to accomplish this obligation. It is important to note that all water quality control plans are subject to periodic review and revision under Water Code section 13240. As such, staff will continue to review the final SQOs consistent with section 13240. The fact that the Board will conduct periodic review of Part 1 and possibly refine the objectives in the future does not mean that the current proposed amendments are not final. When the Board adopts a plan or policy, that action is final.

Comment 23 - While we welcome the expansion of the narrative Part I SQOs to include indirect effects on resident finfish and wildlife it is unclear why State Board staff determined at this point that greater benefit could be achieved through this addition. Since this amendment is being proposed with little justification or consideration for practical implementation at the Regional Board level, we are led to believe the State Board is proposing this amendment merely to satisfy the Supplemental Order, as attached. However, the Proposed Amendments fail to meet the objectives of Phase II SQOs as well as the terms of the Supplemental Order and relevant statute. (SFBKR)
Response – Staff does not understand the comment that questions why staff decided to amend Part 1 with a fish and wildlife SQO. The commenter is a petitioner in the litigation and signed the Second Supplemental Agreement requiring the Board to adopt a final fish and wildlife SQO and submit to OAL by April 29, 2011. Therefore, San Francisco Baykeeper is aware of the Board's obligation to adopt an SQO for fish and wildlife under the agreement. The Board intends to adopt a final fish and wildlife SQO on April 6, 2011, and will submit to OAL for approval on or before April 29, 2011. The scientific rational and justification for the SQO is provided in Section 1.3 of the 2011 draft staff report. The proposed amendments not only satisfy the obligation under the Second Supplemental Agreement, but they also constitute valid SQOs under Porter Cologne because they are based on scientific information, protective of the intended receptors, and can be implemented using ecological risk assessment.

Comment 24 - We note that the State Board is obligated, pursuant to a court enforceable settlement agreement with Bill Jennings and San Francisco Baykeeper, to have adopted and submitted to OAL all Phase II SQOs and related implementation policies, including a final SQO for indirect effects on fish and wildlife in all bays and estuaries in the state, by 29 April 2011. While we appreciate staff's efforts to include a narrative objective addressing wildlife and resident finfish within the scope of Phase I, this fails to satisfy the requirement to have completed all Phase II SQOs and related implementations policies by the agreed upon date. (CSPA)
Response – Staff does not understand the comment that the fish and wildlife SQO fails to satisfy the Second Supplemental Agreement's requirement to adopt all final SQOs by April 29, 2011. CSPA is a petitioner in the litigation and signed the Second Supplemental Agreement requiring the Board to adopt a final fish and wildlife SQO and submit to OAL by April 29, 2011. Therefore, CSPA is aware of the Board's obligation to adopt a specific SQO for fish and wildlife under the agreement. The Board intends to adopt a final fish and wildlife SQO on April 6, 2011, and will submit to OAL for approval on or before April 29, 2011.

Comment 25 - The stated purpose of the SQO Amendments "…is to protect additional receptors not contemplated in Part 1." The California Water Code requires that SQOs be developed as part of a program to protect beneficial uses in bays and estuaries. After reviewing the SQO Amendments, it is clear that these goals have not been met due to the technical

approach taken by staff and the extremely limited application of the SQOs. In fact it is unclear what, if anything, the SQO Amendments will accomplish in terms of enhanced beneficial use protection. Thus we ask the State Board to postpone the adoption of these Amendments and ask staff to reevaluate the proposal entirely. (HTB).
Response – Staff disagrees. The proposed SQO and associated implementation will protect beneficial uses by protecting fish and wildlife using a process that has been applied successfully within many regulatory programs in the United States. The Board cannot postpone the adoption of these amendments because it is under a court order to adopt the amendments and send to OAL for approval by April 29, 2011.

Comment 26- The SQO Amendments attempt to include finfish and wildlife receptors by adding a narrative objective rather than a more objective numeric objective. Exploring these indirect receptors in the development of SQOs is critical, as biomagnification can occur throughout the food chain. However, the Amendments do little to address these receptors and appear completely non-implementable. In fact, it is unclear how and why the recommended alternative was chosen. Thus, the State Board must revisit these receptors and develop technically-sound SQOs that will actually protect beneficial uses. (HTB)
Response – Staff understands that the commenter would like to see a numeric, or more prescriptive SQO. However, Water Code section 13393 does not require that SQOs be numeric; an SQO can be numeric or narrative as long as it is based on scientific information and is protective of the intended receptors. The proposed SQO will protect beneficial uses by protecting fish and wildlife using a process that has been applied successfully within many regulatory programs in the United States. Staff will also conduct period review of Part 1 and will continue to refine the SQOs if necessary and if appropriate resources are available.

Comment 27 - The Phase I SQOs and Amendments will perpetuate the status quo of impaired waters and contaminated sediments that pose an ongoing threat to aquatic life and benthic communities. SQOs are extremely important to protect aquatic life and human health, streamline the regulatory process and standardize contaminated sediment regulation and management across all regions. The SQOs and SQO Amendments do not meet these goals. The approach taken is too complicated and is not fully protective of aquatic life. Further, the application of the SQOs is extremely limited. Also it is unclear if “Phase II” is ever going to be completed. Unfortunately, the Amendments are not adequate to protect beneficial uses and must be revisited by staff. We urge the State Board to take strong leadership on this critical issue and direct staff to reassess the proposal. (HTB)
Response - The proposed SQO is protective because it prevents harm to fish and wildlife by limiting toxic pollutants in sediment. If even the slightest concentration of toxic pollutants would be harmful, then the objective would be violated. In addition, the ecological risk assessment is a peer-reviewed process that has practical implementation. For example, if a discharge has the reasonable potential to exceed the SQO, then the regional board can apply the SQO as a receiving water limit. Consistent with its obligations to conduct periodic review of water quality control plans, Staff will continue to refine the SQOs if necessary, and if appropriate resources are available.

Comment 28- The objectives for resident finfish and wildlife should be based on the same rigorous development process as the aquatic life objectives originally established in the Part 1 SQOs and the indirect effects (human health) objectives currently under development.
Recognizing that efforts to develop additional sediment quality objectives were recently redirected to focus on objectives for resident finfish and wildlife, and that there is a court ordered deadline that the State Water Resources Control Board (State Board) must meet, these objectives have not undergone the same rigorous development process as the aquatic life

(direct effects) objectives and the human health (indirect effects) objectives currently under development. (LABS)
Response – Comment noted.

Comment 29 - In the Resolution adopting the proposed amendments to the Part 1 SQOs, include language that commits to the development of a more prescriptive framework for the implementation of these objectives. Suggested language below is based upon the language in Resolution 2008-0070:
"The State Water Board recognizes this effort is an iterative process. Staff additionally have initiated a second phase of the sediment quality objectives program (Phase 2), which includes extensive sediment sampling in the Delta; further development of the estuarine chemistry, sediment toxicity, and benthic community indicators; and completion of a more prescriptive framework to address human health and exposure to contaminants in fish tissue. The tools, indicators, and framework developed under Phase 2 will be adopted into the draft plan in 2011. Additionally, Staff will initiate development of a more prescriptive framework to address finfish and wildlife exposure to contaminants in sediment (Phase 3). The tools, indicators, and framework developed under Phase 3 will be adopted into the Plan in 2013." (LABS)
Response – Comment noted. The method proposed for implementing the finfish and wildlife SQO is robust, scientifically sound and would protect these resources and associated beneficial uses. All water quality control plans objectives and associated implementation policies are subject to periodic review and update.

Comment 30 - We are pleased to see the amended inclusion of wildlife and resident finfish protection added back to the Sediment Quality Objectives policy. The narrative objective proposed for these endpoints provides needed protection and we agree that this protection needs to be evaluated on a case-by-case basis, based on an ecological risk assessment. (OCSD)
Response – Comment noted

Comment 31 - The City supports the inclusion of narrative SQOs, Section IV.C, for wildlife and resident finfish. (SDSW)
Response - Comment noted

Comment 32 - The Staff Report for the Proposed Amendment states that, following review of scoping comments for Phase II SQOs in 2010, State Board "staff felt that greater benefit could be achieved by refocusing the program resources on receptors not previously considered in Part 1". As a result, this Proposed Amendment serves largely to consider both direct and indirect impacts to resident finfish and wildlife under Part 1. This represents a departure from prior SQO documentation, including the CEQA scoping document for Phase II SQOs, dated April 21, 2010. Baykeeper has been following the efforts by the State Board, San Francisco Estuary Institute (SFEI), Southern California Coastal Water Research Project (SCCWRP) and others to develop numeric indicators and other tools pursuant to Phase II. For several years the State Board has funded a scientific review and stakeholder engagement process presumably aimed at meeting these objectives. We are under the impression this process is on-going However, these efforts are not reflected in the Proposed Amendment, suggesting either the State Board intends to release a more thorough Part 2 SQO at a later date, which would supersede the proposed amendments to Part 1, or that the State Board intends to discard the work generated from years of scientific effort and abandon Phase II efforts. Within the response to comments, please indicate whether the State Board is still funding development of science-based SQOs. (SFBKR)

Response – State Water Board staff has not abandoned its previous efforts set forth in prior SQO documentation, including efforts detailed in the Phase II CEQA scoping document. State Board staff had to temporarily redirect its efforts to focus on the adoption of the fish and wildlife SQOs pursuant to the Second Supplemental Agreement. The litigation has simply affected the timing and development of staff's earlier efforts, and staff fully intends to resume these scientific efforts over time, given available funding and resources. In addition, staff will continue to conduct periodic review of Part 1, consistent with the requirements under Water Code section 13240. Meanwhile, adoption of the proposed amendments will constitute final SQOs and the final SQOs will become effective upon OAL approval.

Comment 33 - We appreciate how difficult it has been to develop Sediment Quality Objectives and applaud the State's efforts to produce scientifically based methods for assessing sediment impairment in California's enclosed bays and estuaries. (OCSD)
Response – Comment noted.

Comment 34 - A margin of safety acts as a "safety net" in the event that incorrect assumptions were made or unknowns exist in the development process. The California Water Code defines SQO as "that level of a constituent in sediment which is established with an adequate margin of safety, for the reasonable protection of the beneficial uses of water or the prevention of nuisance." Emphasis added. Despite this explicit statutory requirement, the technical shortcomings in the approach as described above are not adequately protective of beneficial uses. Further, the SQOs appear to include no measures (explicit or implicit) to incorporate a margin of safety. (HTB)
Response - Comment noted. The basis for establishing a margin of safety is uncertainty. Where uncertainty is high, environmental threshold or standard must be set proportionally lower to account for this uncertainty. Characterizing and quantifying uncertainty is a significant component of all risk assessments.

IMPLEMENTATION – GENERAL ISSUES

Comment 35 - The amendments should not contain any provisions that make water quality standards more difficult to implement. This is especially true given the lack of implementation of the SQOs thus far, which is likely due to the impracticability of implementing existing SQOs. Sediment toxicity testing has long been validated as an appropriate methodology for assessing sediment toxicity. Requiring additional concurrent chemical testing and an assessment of the overall conditions of the benthic community make it impracticable, in the real world, to assess protection of beneficial uses. Instead of superseding existing standards, the SQOs should set a consistent minimum level of protection and maintain and comply with existing narrative objectives (CSPA).
Response- Staff do not believe the proposed amendments will unnecessarily make standards more difficult to implement. Many of the problems that would likely be addressed by the draft proposed amendments are associated with receptors and exposure pathways that could not be effectively protected and assessed using chemical measures, toxicity testing, or bioaccumulation tests. Staff disagrees with the claim regarding sediment toxicity. None of the three MLOE indicators is consistently reliable when used alone or capable of mimicking actual exposure and biological effects to a community of organisms. However, staff has developed an approach to address the use of toxicity for specific situations. In the future, staff intends to amend the 303d Listing Policy, to, among other things, allow the use of toxicity alone when multiple lines of evidence are not available. See also response to comment #13.

Comment 36 - The development of narrative sediment quality objectives can be a major step toward effecting reliable evaluation and regulation of pollutants in aquatic sediments provided that the SQO implementation is grounded in reliable evaluation of sediment toxicity and excessive bioaccumulation of chemicals that are a threat to human health for those who use aquatic organisms as food. (GFL)
Response - Comment noted.

Comment 37 - The intended benefit of developing this policy by the State was to protect benthic community structure, human health, and wildlife health while providing a uniform scientifically based policy for the Regional Boards to implement in a standardized format. The policy provides a specific framework that is being enforced; however, it is not being done so in a uniform way by all Regional Boards creating some confusion for Stakeholders. (OCSD)
Response – Comment noted. Adoption of the proposed amendments will help to increase and streamline consistency among the Regional Boards.

Comment 38- Regional Boards were given flexibility in the policy to determine the site specific nature of each area being investigated. We ask that this flexibility be used to investigate the history of the site, the best methods of clean up action that would be sustainable long term, and to use the causation step to understand the chemical pollutants that are causing the problem. In this economic climate, it is important to spend clean up money in ways that will truly benefit the environment. (OCSD)
Response – Staff agrees, these factors are important when making management decisions.

Comment 39 - To help standardize and interpret the SQO policy systematically, we recommend that all Regional Boards receive multi-day training on the methods and policy actions. Using case studies in each regional area that staff are familiar with and incorporating hands on guidance through these case studies from the policy developers, would help standardize the implementation tremendously state wide. The State has already put good effort towards stakeholder training through SETAC workshops which we appreciate. Increased effort towards training Regional Board staff will help build bridges of understanding and cooperation between regulators and the regulated community towards the common goal of doing what is best for the environment. (OCSD)
Response – Comment noted.

Comment 40 - SWB should reemphasize to the Regional Boards that numeric values, and the individual lines of evidence (LOEs) are not to be extracted and used independently of the fully integrated Bays and Estuaries Plan process. Such statements are in the current Bays and Estuaries Plan, but as demonstrated by the Los Angeles Regional Board's Draft TMDL, Regional Boards may not appreciate the import of these statements. To prevent further misuse of the Bays and Estuaries Plan in the future, SWB should consider clarifying the Bays and Estuaries Plan to reiterate to the Regional Boards that the Bays and Estuaries Plan is an integrated process from which individual LOEs are not to be separated and used in isolation, risking a great expenditure of resources with no commensurate environmental benefit. (L&W2)
Response – Comment noted.

Comment 41 - Please note that we support and incorporate by reference comments to the Proposed Amendment submitted by Heal the Bay and Bill Jennings as well as Baykeeper's prior comments from 2006 to 2010 regarding SQO development and subsequent drafts to Part 1 of the SQOs, as attached. (SFBKR)
Response – Comment noted.

Comment 42 - The key to affording appropriate protection of the aquatic resources from pollutants in aquatic sediments rests with how the revised SQOs narrative objective is implemented into regulatory programs at the State Water Board and Regional Board levels. There are potential significant technical problems with the implementation guidance outlined in the draft report such as on page 19, *"4.4 Ambient and Receiving Water Monitoring* (GFL)
Response – Comment noted.

Comment 43 - The potential for aquatic sediments to be a major source of chemicals that bioaccumulate in aquatic organisms such that they are a threat to human health and wildlife should be based on first finding whether there is excessive bioaccumulation of hazardous chemicals in edible aquatic life. If there is a documentable problem of excessive bioaccumulation in aquatic organisms, it needs to be determined whether the sediments are a significant source of those chemicals. Some of the information being developed as part of the Board's current "indirect effects" assessment work for contaminants in sediments can be used to assess the significance of a sediment as a source of excessive bioaccumulatable chemicals in aquatic organisms. (GLF)
Response – Staff agrees that contaminant concentrations in edible tissue as well as contribution from sediments are important components in the assessment of excessive bioaccumulation. However, this issue is not under consideration at this time.

RESPONSIVENESS

Comment 44 - As stated previously, we have been disappointed by the lack of consideration for comments made by Baykeeper and others in the environmental and public health community. Many of our prior comments remain outstanding so we have chosen not to restate previous concerns but have addressed how the Proposed Amendment fails to satisfy the December 22, 2010 Second Supplemental Agreement and Further Order 99CS02722 ("Supplemental Order"). We sincerely hope that the State Board will carefully consider these as well as outstanding issues raised in previous comments in effort to ensure protection of California's bays and estuaries, pursuant to the Bay Protection and Toxic Cleanup Program and relevant statute. (SFBKR)
Response – Staff worked diligently to ensure that all comments submitted in accordance with requirements contained in each notice were addressed during the hearings and meetings associated with the adoption of Part 1 and/or included in the responses to comments. Staff reviewed Appendix E of the Final Staff Report for Part 1 dated September 16, 2008. In the responses to comments staff identified 29 written comments from San Francisco Baykeeper addressed by staff in Appendix E Responses to Comments. In regards to California Environmental Quality Act (CEQA) informational scoping document, staff does not prepare written responses, though many of these comments are addressed in subsequent staff reports. Also, please note that the CEQA staff informational document provided much greater detail then is typically provided during that stage of development. Staff believes that all substantive comments were addressed in the 2008 staff report supporting Part 1.

SUPERSESSION

Comment 45 - The proposed amendments to the Water Quality Control Plan for Enclosed Bays and Estuaries, Part 1 Sediment Quality Objectives would expand the SQOs to supersede narrative objectives related to protection of fish and wildlife and human consumers of fish. For

example, laboratory testing confirmation of sediment toxicity would no longer by itself be considered an exceedance of the narrative toxicity objective. These changes are not given adequate analysis in the Staff Report and are identified as merely a correction of an omission in the WQCP. These changes are substantive, backslide from previous standards and must be fully analyzed in terms of their impacts on the Water Boards ability to control pollution and related potential environmental impacts (CSPA).
Response – It is staff's intention for the fish and wildlife SQOs and the ERA to supersede all applicable narrative objectives and implementation in basin plans. The biggest reason is because currently, there are few if any sediment quality objectives specific to fish and wildlife in regional basin plans. However, in response to this comment, staff has proposed an additional amendment (see Change Sheet #1) that the fish and wildlife SQO supersede *unless* the State Board approves a basin plan amendment that incorporates a new, more stringent water quality objective and implementation provision.

Comment 46 - The wording of the proposed amendments also appears to expand the SQO to supersede protections for human consumers of contaminated fish. This change would be well beyond the stated scope of the project. (CSPA).
Response – Staff has removed the proposed amendment that would make the SQO for human health supersede all applicable narrative objectives in basin plans. As such, the status quo is preserved.

Comment 47 - The SQO Amendments state that "…all sediment quality objectives and related implementation policies adopted in Part 1 supersede all applicable narrative water quality objectives and related implementation provisions in water quality control plans." Staff Report at 1. The State Board should not make such a blanket statement in the Amendments. This direction is very open-ended, potentially harmful to aquatic life, and should be clarified. There are numerous water quality objectives that could be interpreted to apply to sediment that should not be "superseded" by the SQOs. For example, the Los Angeles Basin Plan Amendment has a water quality objective for pesticides that states, "No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in pesticide concentrations found in bottom sediments or aquatic life." Basin Plan at 3-15. This water quality objective should certainly not be eliminated. The Staff Report provides several examples of narrative objectives potentially applicable to sediment but it does not definite. (HTB)
Response - It is staff's intention for the fish and wildlife SQO and the ERA to supersede all applicable narrative objectives and implementation in basin plans. The biggest reason is because currently, there are few if any sediment quality objectives specific to fish and wildlife in regional basin plans. However, in response to this comment, staff has proposed an additional amendment (see Change Sheet #1) that the fish and wildlife SQO supersede *unless* the State Board approves a basin plan amendment that incorporates a new, more stringent water quality objective and implementation provision.

COMMENTS OUTSIDE THE SCOPE OF THE PROPOSED AMENDMENTS OR NOT ENOUGH INFORMATION TO RESPOND
This acts as a general response to the following comments. The following comments do not warrant any changes to the proposed amendments at this current time because they (1) are outside the scope of the proposed amendments by raising issues that are not under Board consideration at this time; (2) do not address the specific amendments proposed for the Board's

consideration; or (3) do not provide sufficient information for staff to respond. Staff is therefore unable to respond to these comments at this time. However, staff will consider and evaluate these comments when the Enclosed Bays and Estuaries Plan, Part 1: Sediment Quality is next reviewed.

Comment 1 - Uniform reporting would be a plus for CEQA and for Regional reporting. (Dillard)

Comment 2 - The EPA has noticed its intention to disallow PM 2.5 and NOX in the 2007 South Coast Air Quality Management Air Quality Plan. This would be a time to address sources in this area. Climate Change Action Plans CCAP needs to incorporate this data. Those CCAP are being considered to be integral to the General Plans and the CEQA monitoring. Please refer to the State Attorney General's office in this matter. (Dillard)

Comment 3 - Is the basin adjudicated, so responsibility is delineated. The Santa Monica Basin is not adjudicated for groundwater rights and that issue becomes one of individual property owners' responsibility. (Dillard)

Comment 4 - Landfills and there procedures need to be reviewed. (Dillard)

Comment 5 - Have faults been identified which would play into sediment capture. Funding has been a problem in identifying in geological surveys. (Dillard)

Comment 6 - Sediment in the environment is a dynamic and natural feature of the world all around us. Braided streams would not exist if sediments did not build up over time causing the stream or river to periodically change course. Estuaries by their very definition rely on the deposition of sediment to protect them from the oceans constant attacks on our shorelines; if fresh sediment is not deposited, the estuaries will cease to exist. Likewise wetlands exist due to silt and sediment deposition not in spite of them. The State Board may pursue additional restrictions on sediments but the proposed regulations/laws will not stop nature and its laws of equilibrium. Soils at the top of mountains are eroded over time and deposited in lower regions. Please do not make any proposed changes to the sediment quality objectives via any amendment unless the changes are to repeal the objectives in total. (Olsen)

Comment 7 - The statement that the sediment quality objective document adopted in 2008 "*protects benthic invertebrates from direct exposure to toxic pollutants in sediment and human consumers of resident fish and shellfish from contaminants in fish tissue that were transferred through the food web from sediments into finfish and shellfish."* is not technically reliable as discussed in our previous writings on the subject that are available on our website [www.gfredlee.com] in the Contaminated Sediment section. As noted further below, there is need to update and correct the 2008 SQOs Plan to more reliably protect the beneficial uses of the waterbodies in which the contaminated sediments are located. As discussed in comments we made to the Board at the time of the SQO Plan adoption, there are technical deficiencies in the 2008 SQOs Plan that will cause public and private interests to spend large amounts of funds in the name of sediment "remediation" – "remediation" that is not based in sound technical evaluation and that cannot be relied upon to address real causes of sediment toxicity (GFL)

Comment 8 - The 2008 SQOs Plan needs to be updated to more reliably protect the beneficial uses of the waterbodies in which the contaminated sediments are located. As discussed in comments we made to the Board at the time of the SQO Plan adoption, there are technical deficiencies in the 2008 SQOs Plan that will cause public and private interests to spend large amounts of funds in the name of sediment "remediation" – "remediation" that is not based in

sound technical evaluation and that cannot be relied upon to address real causes of sediment toxicity. (GFL)

Comment 9 - Studies by the Board's own contractors demonstrate that there is little or no relationship between total concentration of chemicals in sediments and resultant toxicity and bioaccumulation. Co-occurrence based approaches and methods using total contaminant concentrations as the basis for evaluating sediment quality and toxicity or employing statistical correlations as a means of identifying causes of sediment toxicity are unreliable and should be abandoned. Toxicity testing followed by Toxicity Identification Evaluations (TIEs) and bioaccumulation testing is more scientifically defensible and offers a relatively simple, economical and effective approach to evaluating sediment toxicity and excessive bioaccumulation of chemicals that are a hazard to the health of those who use aquatic life as food. (CSPA)

Comment 10 - The list of pollutants addressed in the current SQOs should be expanded to include other constituents that have been extensively identified as causing sediment toxicity. (CSPA)

Comment 11 - It has already been noted in these comments, and discussed at length by us and in the broader technical literature, there is no cause-and-effect coupling between total concentrations of contaminants in sediment and adverse impact or "risk" of impact associated with those chemicals that is essential for meaningful and technical valid evaluation and management. Further, the term "sediment chemistry" is misused in that passage as it refers to chemical composition and concentration rather than "chemistry." Chemistry should refer to reactions and rates of reactions that lead to chemical composition of a sediment. As discussed in our original comments on the then-proposed SQOs (cited below), sediment chemical composition is not a reliable approach for site assessment and cleanup goals. (GFL)

Comment 12 - One of the most significant deficiencies in the current SQOs is their limited scope of pollutant types that are addressed. The deliberate exclusion of ammonia, low-DO conditions caused by nutrient discharges to a waterbody, pyrethroid-based pesticides, and others and the inclusion of only a few of the well-known, and even less concerning, pollutants in aquatic sediments represents a very significant shortcoming in the current SQOs Plan that should be immediately corrected. Ammonia, pyrethroid-based pesticides, and low-DO conditions are among the most significant causes of real sediment toxicity. Large amounts of money will be spent in "remediating" sediments targeted because of their heavy metal content that may or may not be causing water quality problems, while ignoring known, more important causes of sediment toxicity is contrary to the public interests. (GFL)

Comment 13 - The Part 1 SQO Plan should be immediately amended to eliminate the grandfathering of previously adopted, unreliable TMDL remediation goals based on co-occurrence-based approaches. (GFL)

Comment 14 - Chemical concentration-based approaches should not be used in the estimation of sediment toxicity. Properly developed, technically sound TIEs are essential to the reliable identification of the cause of the sediment toxicity. (GFL)

Comment 15 - The chemical concentration-based so-called "chemistry" component of the current SQOs should be abandoned for use in evaluating sediment quality since it has been

well-established that there is no relationship between the total concentration of a chemical in sediments and aquatic life toxicity. (GFL)

Comment 16 - The list of focus chemicals that can cause sediment toxicity needs to be expanded to include ammonia, nutrient-caused low-DO situations, and pyrethroid pesticides; those parameters in particular, should be given high priority for attention. (GFL)

Comment 17 - There is no relationship between the total concentration of a chemical in sediments and its toxicity to or bioaccumulation within aquatic life. The wording in this Draft Report needs to state emphatically in that such approaches are not to be used in association with screening, evaluation, or management of sediments. (GFL)

Comment 18 - One of the most significant deficiencies in the current SQOs is their limited scope of pollutant types that are addressed. The deliberate exclusion of ammonia, low-DO conditions caused by nutrient discharges to a waterbody, pyrethroid-based pesticides, and others and the inclusion of only a few of the well-known, and even less concerning, pollutants in aquatic sediments represents a very significant shortcoming in the current SQOs Plan that should be immediately corrected. Ammonia, pyrethroid-based pesticides, and low-DO conditions are among the most significant causes of real sediment toxicity. Large amounts of money will be spent in "remediating" sediments targeted because of their heavy metal content that may or may not be causing water quality problems, while ignoring known, more important causes of sediment toxicity is contrary to the public interests. (GFL)

Comment 19 - Because of their inherit unreliability for this purpose, total contaminant concentrations should be eliminated from the SQO protocols used to evaluate "sediment quality" and sediment toxicity. Instead, narrative SQOs based on direct measurement of toxicity should be used as the primary tool for assessing sediment quality with respect to toxicity to aquatic life. (GFL)

Comment 20 - The SQO Plan relies on the integration of three lines of evidence to determine sediment impairment. The multiple lines of evidence approach is an ineffective way to determine if sediments are contaminated and impaired. Multiple lines of evidence are not always needed to identify that there is a problem that requires a response. This is especially true for toxicity. Toxicity tests act as the "safety net" for water quality and sediment quality monitoring because monitoring programs do not test for all constituents that can cause receiving water or sediment toxicity. The goal should be that all three tests are "clean." Further, the steps proposed to integrate the lines of evidence and determine impairment is extremely complex and subjective. The individual lines of evidence should be considered on their own merit. (HTB)

Comment 21 - If monitoring data for all three tests are unavailable, the SQOs should still allow for a sediment assessment. Consider the hypothetical situation where multiple bioassays demonstrate toxicity, but there is no chemistry and limited community data. Under the multiple lines of evidence approach no assessment could be conducted, yet a negative impact is likely. Of note, benthic community monitoring is rarely performed in potential hotspot areas except where there is a POTW NPDES Permit. (HTB)

Comment 22 - The Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (State Listing Policy) must be revised in order to be consistent with the Part 1 SQOs. There are inconsistencies between the State Listing Policy and the existing sediment quality objectives in Part 1 as well as the proposed amendments to Part 1. Such inconsistencies include, but are not limited to, Sections 3.6, 3.8, 3.9, 6.1.3, 6.1.5.8 of the Listing

Policy. These inconsistencies create confusion in the regulatory framework, particularly in 303(d) listing and delisting decisions and the development and establishment of TMDLs. The importance of amending the 303(d) listing policy was noted by the State Board in the Resolution that adopted the Part 1 SQOs (Resolution 2008-0070) which states:
"The State Water Board's Clean Water Act section 303(d) listing policy was adopted prior to the development of SQOs and without the benefit of the scientific evidence supporting their development. The State Water Board recognizes the need to ensure that the listing policy and this plan are consistent. The State Water Board will, therefore, consider amending the 303(d) listing policy in the future to ensure consistency with this plan."
The Part 1 SQOs (both the existing and proposed objectives) establish objectives that address sediment chemistry, sediment toxicity, benthic community health, wildlife, and finfish. The State Listing Policy approach to these issues is now outdated. Per the Clean Water Act, identifying waters as impaired and thus requiring the development of TMDLs is predicated upon a determination that waters do not meet applicable *water quality standards*, as noted in the Resolution that adopted the State Listing Policy (Resolution No. 2004-0063):
"Section 303(d)(1) of the federal Clean Water Act (CWA) requires states to identify waters that do not meet applicable water quality standards with technology-based controls alone and prioritize such waters for the purposes of developing Total Maximum Daily Loads (TMDLs) [40 Code of Federal Regulations (CFR) 130.7(b)]"
Resolution 2008-0070 also directed State Board staff to initiate appropriate proceedings to amend the State Listing Policy by February 2009. The amendments to the Listing Policy are therefore two years past due. As these inconsistencies continue in the regulatory framework, it will become increasingly more difficult for regulators and the regulated community to identify the State's intent on defining what constitutes the protection of beneficial uses. As there are numerous TMDLs currently being reevaluated and developed that address sediment quality issues, time is of the essence for the State Board to consider the necessary amendments to the Listing Policy. The Bureau is available willing to assist State Board staff in this effort.
Requested Action: In the Resolution adopting the proposed amendments to the Part 1 SQOs, include language that commits to the development of amendments of the State Listing Policy to ensure consistency between the Listing Policy and the Part 1 SQOs. Suggested language is based upon Resolution 2008-0070: As stated in Resolution 2008-0070, the State Water Board's Clean Water Act section 303(d) listing policy was adopted prior to the development of SQOs and without the benefit of the scientific evidence supporting their development. The State Water Board recognizes the need to ensure that the listing policy and this plan are consistent. The State Water Board will, therefore, initiate development of amendments to the 303(d) listing policy to ensure consistency with this plan. Amendments to the 303(d) listing policy will be considered for adoption in 2011. (LABS)

Comment 23 - An additional area of concern that currently undermines the scientific validity of the State adopted SQO methods is the 303(d) policy language. Waterbodies that show impairment through the SQO process should be listed as impaired. As currently written, the 303(d) policy allows Regional Boards to break the SQO process into individual lines and list on only one line of evidence. The SQO policy states clearly that single lines of evidence do not accurately portray the impairment of a waterbody and that all three lines must be measured and evaluated together. This has also been published and accepted in the scientific literature. Listing based on one line of evidence is not scientifically defensible and undermines the proper implementation of Sediment Quality Objectives. This practice leads to an over-abundance of false positives of impaired waterbodies in an economic climate where funding is limited. Effort should be put into properly classifying waterbodies and putting funding where it is most needed for clean-up and abatement work (OCSD)

Comment 24 - Has the source points of Total Daily Maximum Loads been identified. We find not enough monitoring upstream. The recent US Ninth Circuit Court of Appeals Opinion No. 10-56017 Natural Resources Defense Council Inc., Santa Monica Baykeeper v. County of Los Angeles, Los Angeles Flood Control District ETAL weighs into the issue in Los Angeles County Watershed Management Areas (Dillard)

Comment 25 - There is need to immediately correct the technical shortcomings and errors reflected in the Part 1 SQOs, including the elimination of the grandfathering of previously adopted sediment TMDL goals developed through co-occurrence-based sediment quality guidelines. (GFL)

Comment 26 - The Draft report fails to address several significant deficiencies in the September 16, 2008 SQO Plan that undermine the Plan's technical validity. For example, use of co-occurrence-based sediment quality objectives is allowed by the September 16, 2008 SQO Plan if the Regional Board had incorporated them into TMDL goals adopted prior to February 19, 2008. Co-occurrence-based objectives and regulatory instruments should not be allowed. As discussed below there is immediate need to amend the Part1 SQO plan to correct this significant error. (GFL)

Comment 27- The Part 1 SQO Plan should be immediately amended to eliminate the grandfathering of previously adopted, unreliable TMDL remediation goals based on co-occurrence-based approaches. (GFL)

Comment 28 - On November 16, 2010 the Board approved a TMDL developed by the LARWQCB that is said to eliminate "toxicity" in the Colorado Lagoon sediments. That TMDL has as a goal of achieving "Effects Range Low" (ERL) concentrations of organochlorine legacy pesticides, PCBs, and several heavy metals in the lagoon's sediments. It stipulates that the responsible parties for the targeted chemicals in stormwater runoff (city of Long Beach, Caltrans, and Los Angeles County Flood Control District) are to remediate the lagoon sediments and control the sources to eliminate the exceedances of the ERLs for the target chemicals in the Colorado Lagoon. The Boards' actions notwithstanding, that TMDL and associated requirements are technically invalid and indefensible; they are not based on technically valid concepts, principles, or findings. Not only are the TMDL approach and requirements unreliable for addressing sediment quality issues in the Colorado Lagoon, but also they provide misleading precedent for sediment quality evaluation and management elsewhere. Failure to develop and implement technically valid TMDL goals for controlling appropriately targeted chemicals will lead to the expenditure of large amounts of public funds by parties responsible for stormwater runoff to the Colorado Lagoon, without the justified expectation of their elimination of the real, significant water quality impairments caused by lagoon waters/sediments. The BOARD also considered a TMDL for control of so called sediment toxicity due to PCBs and organochlorine legacy pesticides in sediment of McGrath Lake in Ventura County. That TMDL, whose goal is the achievement of ERLs, is similarly technically invalid. The Colorado Lagoon TMDL and the McGrath Lake TMDL, both directed toward controlling aquatic sediment toxicity for PCBs and organochlorine legacy pesticides using technically invalid ERL based approaches adopted by the LARWQCB several years ago, need to be revised to focus on the real, significant water quality problems in those waterbodies. Ed Long of Long and Morgan has stated that the ERM/ERL should not be used for bioaccumulatable chemicals such as PCBs. (GFL)

Comment 29 - The Board/State of California needs to take aggressive action to prevent the US EPA Region 9 from further imposition of technically invalid co-occurrence-based TMDLs and

remediation goals on California stormwater management agencies and other California dischargers. (GFL)

Comment 30 - Although we disengaged with the stakeholder group, Heal the Bay acknowledges the importance of developing technically-sound SQOs to differentiate between clean and impacted sediments. Thus, we have been involved in the process by attending and commenting at the State Board workshops and submitting written comments on draft reports. Despite critical flaws with the SQOs Phase I that were described in our comment letter to the State Board dated November 30, 2007, the SQOs were adopted without modification by the State Board on September 16, 2008. These flaws have become all the more evident with the issuance of a Draft TMDL for the Toxic Pollutants in Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters. Thus, many of the same concerns are reiterated below. (HTB)

Comment 31 – The RWB impermissibly uses portions of the Bays and Estuaries Plan in isolation, and fails to complete the required multi-step process. In December 2010, the RWB released the Draft TMDL to address alleged impairments from toxic pollutants in waterbodies in the Dominguez Channel and Greater Los Angeles and Long Beach Harbor waters (collectively, "the Harbor Waters"). As part of the Draft TMDL, the RWB proposed "sediment targets" for several pollutants, including DDT. The Draft TMDL ignores the integrated, multi-step process set forth in the Bays and Estuaries Plan. Instead, the Draft TMDL improperly excerpts portions of the Bays and Estuaries Plan and uses these provisions in isolation as targets for the individual LOEs. For example, the Draft TMDL Staff Report states that the target for the benthic community effects LOE is either "reference" or "low" disturbance. The Draft TMDL Staff Report also sets the target for the toxicity LOE as "nontoxic." For the sediment chemistry LOE, the Draft TMDL improperly utilizes the "Effect Range Low" ("ERL") screening values, which are not even a part of the Bays and Estuaries Plan, and uses these values in isolation to try to support sediment cleanup levels in the Harbor Waters. (L&W2)

Comment 32 - The Draft TMDL uses these targets and screening values to develop TMDL standards without completing the mandatory steps set forth in the Bays and Estuaries Plan, including the MLOE process, stressor identification, studies on the chemical linkage to impairment, identification of pollutant chemicals or classes of chemicals, source identification, and development of Sediment Management Guidelines ("SMGs") consistent with the course of action. The RWB's use of the ERL screening values is especially concerning because the ERL screening values were not developed through, or endorsed by, the Bays and Estuaries Plan process or any similar MLOE approach. Rather, the ERLs are screening values, which are relevant only to the sediment chemistry LOE, as they do not predict sediment toxicity or benthic community effects. The study, which developed the ERL screening values, explicitly stated that the ERLs were not meant as indicators of toxicity or biologic effects. 19 This is especially true for mercury, nickel, total PCBs, total DDT, and DDE which were all identified in the ERL study as chemicals for which "there were relatively weak relationships between their concentrations and the incidence of effects. Two years after the ERLs first were published, government scientists from the United States Environmental Protection Agency ("EPA") and the National Oceanic and Atmospheric Administration ("NOAA") recognized the lack of utility for using the ERLs and the "effects range median" ("ERM") a higher, related screening value for purposes of setting sediment targets, stating: *"The lack of even ER-L exceedance does mean that toxic effects are unlikely, but ER-M exceedances should only be taken to indicate that further analysis is in order. They should never be taken, by themselves, to mean that sediment is exerting a toxic effect upon the environment or that there would be any benefit to decreasing its chemical content."* Neither the ERLs nor the disturbance levels set out in the Bays and Estuaries Plan

were intended to be directly used to develop TMDL standards or establish sediment cleanup levels, outside of the integrated process required by the Bays and Estuaries Plan. It is clear that the RWB's extraction of individual provisions of the Bays and Estuaries Plan in the Draft TMDL not only did not comply with the many requirements of the Bays and Estuaries Plan, including the MLOE and step-wise processes, but is also not related to the stated objectives of the Bays and Estuaries Plan to protect the benthic community and human health? (L&W2)

Comment 33 - Use of numeric thresholds separate from the fully integrated process risks a misallocation of resources, as demonstrated in the Draft TMDL. Achieving compliance with the Draft TMDL would require implementation costs, which RWB has estimated to exceed $900 million, including a dredging program with a cost estimated at nearly $700 million. This estimate, however, is based on the low end of the sediment volume the Draft TMDL predicts will need to be dredged, and an unrealistically low value per cubic yard for the cost of remedial dredging. Applying the R WB' s higher range for dredged material and a mid-range unit dredging cost, the actual cost of complying with the Draft TMDL could likely approach $7.0 billion. Because the Draft TMDL has many flaws, some of which are pointed out in this comment letter, the cleanup program proposed by RWB is unwarranted, but this enormous estimated cost demonstrates the profound consequences which may occur if Regional Boards are allowed to improperly isolate numeric values out of studies and policies like the Bays and Estuaries Plan without completing the required integrated process. (L&W2)

Comment 34 - Identifying Cause of Toxicity/Bioaccumulation
There are no documented cause-and-effect *"Correlations between individual chemicals and biological endpoints"* of toxicity and bioaccumulation; based on total chemical composition and toxicology, no simple usable correlation would be expected. "Statistical methods" outlined in item (a) should not be applied unless and until their foundation in "cause-and-effect" has been documented and their predictive capability have been demonstrated with "before and after" data. The application of "statistical correlations" as a substitute for cause-and-effect-based TIEs/biological response studies can be expected to lead to incorrect labeling of problem sediments, "identification" of causes of "impacts" (e.g., heavy metals, organic chlorine legacy pesticides, PCBs), and anticipated "benefits" associated with any given "remediation" since that approach ignores the aquatic chemistry of these chemicals in sediments. The fact that a "statistical relationships" can be developed between parameters does not mean that the "relationships" have any capability to reliably predict changes in sediment toxicity/water quality characteristics that would result from changes in chemical concentrations in sediments. Such a demonstration of cause-and-effect is essential for the development of reliable sediment cleanup objectives. Any statistical relationship between chemical concentrations in sediments and sediment toxicity must be solidly grounded in fundamental mechanisms (cause-effect) that influence how a chemical in sediments could impact sediment toxicity. Without such a foundation, the statistical relationship is simply game-playing. (GLF)

Comment 35 - Gradient analysis is not reliable for identifying the cause of sediment toxicity. As discussed above, this would require that an undemonstrated cause-and-effect reflect relationship be presumed. Further, it would be quite unexpected for the concentrations of only the unique identifiable responsible chemical to change with distance from a "hotspot." It presumes also that the cause of an impact is not only a known chemical but also one that is included in the limited suite of chemicals measured. Even with a known cause of toxicity, the manifestation of toxicity may not be seen to decrease with decreasing concentration if the contaminant bioavailability is not properly taken into account or if the available concentration remains above a toxic threshold. (GLF)

Comment 36 - Unreliable approaches for sediment toxicity identification, including the statistical correlations and gradient analysis, should be removed from the toxicity identification procedures suggested in the current SQOs. (GFL)

Comment 37 - The SQOs target the surficial sediments "…representing recent depositional materials and containing the majority of the benthic community." Specifically, this appears to be designated as 5 cm. However, the Staff Report does not provide sufficient justification for limiting the scope to the top 5 cm of sediment. In fact, this decision appears extremely arbitrary and greatly limits the scope of the SQOs. (HTB)

Comment 38 - While it is true that the surficial sediments are the primary exposure pathway, limiting the scope to sediments in the top 5 cm is completely inappropriate. Examining just the very top layer of sediment does not give sufficient insight on the ecological health of the waterbody. Species such as ghost shrimp and spoon worms go down a meter or more into the sediments. Burrows of Thassaladian mud-shrimps have been reported to reach down to 2.5-meter sediment depths.1 According to the Monterey Bay Aquarium ghost shrimp tunnel almost constantly, reworking the sediment to a depth of as much as 30 inches (76 cm), and these burrows provide shelter for other invertebrates.2 Thus, buried sediments can impact the benthic community and beneficial uses. USEPA's work on the DDT and PCB contaminated sediments off of Palos Verdes supports a thicker active layer. The final remediation plan includes a cap of 45 centimeters to prevent significant bioturbation for benthic infauna. USEPA and the Los Angeles Regional Board have been involved with contaminated sediments issues in the Port of Los Angeles and Long Beach area where sediment caps for contaminated sediments of 1 meter or greater have been required. Also sediments can be dynamic and can move and be buried due to a single storm event and legacy contaminated sediment may be buried. Clearly, the USEPA and Regional Board should consider deeper sediments in order to understand the health of the water body and ensure that beneficial uses are protected for all species. (HTB).

Comment 39- Limiting the scope to the top 5 cm also creates an implementation problem. If the SQOs indicated that the top 5 cm are impaired, will a remediation effort only dredge the top 5 cm? Then will another monitoring event be conducted right away to make sure the next 5 cm meets the SQOs? Will the process go on and on? As a point of comparison, maintenance dredging projects typically remove at least the top meter of sediments and some of them remove 5 meters or more. Thus, the 5 cm designation is a huge logistical issue. (HTB)

Comment 40 - Concentrations of chemicals in sediment or "criteria" based on, or indexed to, sediment concentrations should not be included among "multiple indicators" of the health of beneficial uses. Such measures are unrelated to impacts of sediment associated chemicals and serve only to skew assessments of sediment quality in an arbitrary manner. The foundation of the implementation of the proposed narrative SQOs is the reliable measurement of

- toxicity within sediments and resulting from suspension of bedded sediments, and
- excessive bioaccumulation of pollutants in edible aquatic life which poses a threat to health of those who eat the aquatic organisms and wildlife.

There have been and continue to be attempts made by the State and Regional Boards to try to use concentrations of sediment-associated chemicals together with some correlative factor to "estimate" toxicity and the potential for excessive bioaccumulation. However, it has been well established in the technical literature and in practice that the concentration of a contaminant or group of contaminants in aquatic sediment is not a reliable predictor of sediment toxicity or bioaccumulation. It has also been well-established that "co-occurrence"-based "sediment quality guidelines" such as those developed by Long and Morgan and subsequently by MacDonald are technically invalid for use as screening or regulatory limits to establish "impairment" of

sediments or as TMDL sediment remediation goals. Such chemical concentration-based approaches are trapping the public, commerce, and industry into costly sediment "remediation" programs that fail to address the real cause and sources of aquatic toxicity in the sediments. (GFL)

Comment 41 - That section does not sufficiently describe the serious technical deficiency of incorporating co-occurrence-based approaches, including ERM, PEL, AET, for estimating sediment toxicity. The co-occurrence-based approaches that serve as the foundation of ERMs, ERLs, PEL, among other such surrogates, are technically invalid and should not be used for any evaluation or management purpose. The studies conducted by BOARD contractors in developing the Part 1 SQOs Plan clearly demonstrated what had been demonstrated in the 1970 by Lee and his associates: there is no relationship between the total concentration of a chemical in sediments and its toxicity to or bioaccumulation within aquatic life. The wording in this Draft Report needs to state emphatically in that such approaches are not to be used in association with screening, evaluation, or management of sediments. (GFL)

Comment 42 - A properly designed and conducted TIE is a valid approach for identification of the cause of sediment toxicity.
d. "Bioavailability—Chemical pollutants may be present in the sediment but not biologically available to cause toxicity or degradation of the benthic community. There are several measures of bioavailability that can be made. Chemical and toxicological measurements can be made on pore water to determine the availability of sediment pollutants. Metal compounds may be naturally bound up in the sediment and rendered unavailable by the presence of sulfides. Measurement of acid volatile sulfides and simultaneously extracted metals analysis can be conducted to determine if sufficient sulfides are present to bind the observed metals. Similarly, organic compounds can be tightly bound to sediments. Measurements of sediment organic carbon and other binding phases can be conducted to determine the bioavailable fraction of organic compounds. Solid phase microextraction (SPME) or laboratory desorption experiments can also be used to identify which organics are bioavailable to benthic organisms."*
These approaches if correctly implemented can be a useful tool to identify the potential bioavailability of a chemical in sediments. However caution should be exercised in relating bioavailability of a particular chemical to the cause of sediment toxicity as measured in toxicity tests.
e "Verification—After specific chemicals are identified as likely causes of impairment, analysis should be performed to verify the results. Sediments can be spiked with the suspected chemicals to verify that they are indeed toxic at the concentrations observed in the field. Alternately, animals can be transplanted to suspected sites for in situ toxicity and bioaccumulation testing."
If properly conducted, the "verification" step identified in item (e) is a potentially powerful tool to help reliably identify the cause of sediment toxicity. While not named as such in the discussion, that approach is basically the "standard additions" approach widely used in analytical chemistry to estimate the concentration of a chemical that cannot be measured directly. Description of the standard additions approach is available in such internet sources as http://en.wikipedia.org/wiki/Standard_addition and http://www.asi-sensors.com/ASI/learning/standard_addition.pdf. Basically it involves adding the suspected toxicant (in appropriate chemical form) in small increments and measuring the resultant toxicity response. If the chemical of potential concern is responsible for the initially observed toxicity, an increase in toxicity somewhat proportional to the addition would be expected. Critical to appropriate use of this approach for "verification" is the understanding that the behavior of a chemical as a toxicant may change with time after the addition due to chemical transformations that can take place in the sediments. As a result, it is important to conduct the standard

additions over aging time to see if the toxic response is also related to incubation time. Care must also be exercised in over-reading or over-extrapolating the results of such "verification." (GLF)

Comment 43 - Based on findings in similar situations, to the extent that there is aquatic life toxicity in Colorado Lagoon sediments, it is most likely due to pyrethroid based pesticides derived from the use of such pesticides in residential properties in the Colorado Lagoon watershed. Lee has had extensive experience in water quality impacts of pyrethroid pesticides; his work was the first to find that these types of pesticides were a cause of part of the aquatic life toxicity in the tributaries of Upper Newport Bay, CA. On behalf of the Santa Ana Regional Water Quality Control Board he and his colleagues conducted a major study of aquatic life toxicity in those tributaries during stormwater runoff events and developed several reports discussing the findings, including: Lee, G. F. and Taylor, S., "Results of Aquatic Toxicity Testing Conducted During 1997-2000 within the Upper Newport Bay Orange County, CA Watershed," Report of G. Fred Lee & Associates, El Macero, CA (2001). Since completing the original studies in the 1990s he and others have found that pyrethroid pesticides are a common cause of aquatic life toxicity in water and sediments of urban waterbodies. They are likely to be the cause of aquatic life toxicity in Colorado Lagoon sediments, as well, and this toxicity will likely continue for many years to come since the pesticide regulatory agencies have indicated that it will likely be a number of years before the pyrethroid based pesticides are regulated to control aquatic life toxicity in urban stormwater runoff and waterbody sediments. Since the PCBs in the sediments of Colorado Lagoon are unlikely to be contributing to toxicity of those sediments, and since pyrethroid pesticides and other real potential causes of toxicity are not being addressed in a reliable manner, in this TMDL the dredging of the lagoon sediments to remove PCBs will not address, much less remedy, the toxicity problem. Information on the role of PCBs and other bioaccumulatable chemicals in aquatic sediments in impacting a waterbodies water quality is available in, Lee, G. F., and Jones Lee, A., "PCBs as an Unlikely Cause of Urban Aquatic Sediment Toxicity: Colorado Lagoon Sediment TMDL," Report of G. Fred Lee & Associates, El Macero, CA, December 3 (2010). http://www.gfredlee.com/Sediment/PCBs□SedToxicity.pdf.

Comment 44 - Causation and waste load allocations are outside of the SQO policy and if stakeholders/Regional Board staff would like more tool sets developed for TMDL efforts, then money should be set aside by the State to fund that as a new policy effort rather than diminish the utility and function of the SQO policy. (OCSD)

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