

ENCLOSURE B



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

March 4, 2019

MEMORANDUM

SUBJECT: Water Quality Control Plan for Enclosed Bays and Estuaries Plan. Part 1:
Sediment Quality

FROM: Terrence Fleming, Environmental Scientist
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THRU: David Smith, Section Chief
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TO: Administrative Record

Memorandum for the Record:

The Environmental Protection Agency (EPA) has reviewed the request for approval of the State Water Resources Control Board (State Water Board) Water Quality Control Plan for Enclosed Bays and Estuaries – Sediment Quality Provisions. The Sediment Quality Provisions were adopted by the State Water Board on June 5, 2018 under State Water Board Resolution No. 2018-0028. The California Office of Administrative Law approved the rulemaking file and regulatory action on November 14, 2018 (OAL #2018-1002-01). The State Water Board submitted the Sediment Quality Provisions to EPA for approval on January 11, 2019.

The Sediment Quality Provisions include narrative sediment quality objectives protecting 1) benthic communities from direct exposure to pollutants in sediments 2) human health risk from the consumption of fish and shellfish tissue that may pose a risk because of contaminants in sediment and 3) protecting wildlife and resident finfish from exposure to contaminants in sediment. The Sediment Quality Provisions also include a description of the applicable beneficial uses, a description of how the narrative objectives may be interpreted and how these narrative objectives shall be applied to existing water quality protection plans.

EPA is approving the narrative objectives wildlife and resident finfish (Section III.A.2.c), revisions to table 6 (Section IV.A.1.h) implementing the narrative aquatic life use as water quality standards, and the approach to interpret the fish consumption objectives for chlorinated pesticides and PCBs (Section IV.A.2.a). The rationale for EPA approval is described in this memo.

Statutory and Regulatory Background:

Section 303(c) of the Clean Water Act (CWA) requires EPA to approve or disapprove new or revised state-adopted Water Quality Standards (WQS). The State regulatory provisions that are subject to EPA's approval authority under Section 303(c) are those addressing beneficial uses, water quality criteria, antidegradation and policies generally affecting the application and implementation of WQS for surface waters.

CWA sections 303(a)-(c) direct states to establish WQS. 33 U.S.C. § 1313(a)-(c). These WQS describe the desired condition of a waterbody and consist of three principal elements: (1) the "designated uses" of the state's waters, such as public water supply, recreation, propagation of fish, or navigation; (2) "criteria" specifying the amounts of various pollutants, in either numeric or narrative form, that may be present in those waters without impairing the designated uses; and (3) antidegradation requirements, providing for protection of existing water uses and limitations on degradation of high quality waters.

EPA's regulations at 40 C.F.R. Part 131 describe the requirements and procedures for developing, reviewing, revising, and approving WQS. EPA staff find that Sections I through III, and parts of IV of the Sediment Quality Provision include new or revised WQS subject to EPA's section 303(c) approval authority. EPA staff finds that these sections of the Sediment Quality Provisions meet the criteria for approval under CWA Section 303(c)(1) and 40 CFR Part 131 and recommend that they be approved as WQS under 40 CFR Part 131.21. Staff's recommendation is based on our finding that the Sections are consistent with the requirements of the CWA and EPA's regulations at 40 CFR Part 131.5 and 131.6.

Summary and Analysis of Revisions Recommended for Approval:

The Sediment Quality Provisions apply only to subtidal surface sediments in enclosed bays and estuaries as defined in the Enclosed Bays and Estuaries Plan (Plan).

1. Beneficial Uses.

The Sediment Quality Provisions make no changes to the State's beneficial uses. Tribal Tradition and Culture, Tribal Subsistence Fishing and Subsistence fishing uses were previously established in the Plan as part of the State Water Boards' Mercury objectives approved by EPA on July 14, 2017. These beneficial uses are only applicable where the beneficial uses are adopted in basin plans.

Table 1. Beneficial Uses and Target Receptors

Beneficial Uses	Target Receptors
Estuarine Habitat	Benthic Community/Finfish/Wildlife
Marine Habitat	Benthic Community/Finfish/Wildlife
Commercial and Sport Fishing	Human Health
Aquaculture	Human Health
Shellfish Harvesting	Human Health
Tribal Tradition and Culture	Human Health
Tribal Subsistence Fishing	Human Health
Subsistence Fishing	Human Health
Rare, Threatened, or Endangered Species	Finfish/Wildlife
Preservation of Biological Habitats of Special Significance	Finfish/Wildlife
Wildlife Habitat	Wildlife
Spawning Reproduction and Early Development	Finfish

2. Narrative Objectives

The following aquatic life narrative objectives apply to Estuarine Habitat (EST) and Marine Habitat (MAR):

“Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities in bays and estuaries of California. This narrative objective shall be implemented using the integration of multiple lines of evidence (MLOE) as described in Chapter IV.A.1”

The following human health narrative objective applies to Commercial and Sportfishing (COMM), Aquaculture (AQUA), Tribal Tradition and Culture, Tribal Subsistence Fishing and Subsistence Fishing

“Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health in bays and estuaries of California. This narrative objective shall be implemented as described in Chapter IV.A.2”

The following wildlife and resident finfish narrative objective applies to Estuarine Habitat (EST) and Marine Habitat (MAR), Rare, Threatened, or Endangered Species (RARE), Preservation of Biological Habitats of Special Significance (BIOL), Wildlife Habitat (WILD) and Spawning Reproduction and Early Development (SPAWN):

“Pollutants shall not be present in sediment at levels that alone or in combination are toxic to wildlife and resident finfish by direct exposure or bioaccumulate in aquatic life at levels that are

harmful to wildlife or resident finfish by indirect exposure in bays and estuaries of California. This narrative objective shall be implemented as described in Chapter IV.A.3.”

EPA had previously approved the aquatic life narrative and human health narratives on 8/27/2009. EPA finds that the addition of the Wildlife and Resident Finfish narrative objectives (III.A.2.c) to the Enclosed Bays and Estuaries Plan will provide additional protection to these waters.

IV. Implementation Procedures

To assess whether items within the implementation procedures are WQS EPA uses the following 4-part test:

1. Is it a legally binding provision adopted or established pursuant to state or tribal law?
2. Does the provision address designated uses, water quality criteria (narrative or numeric) to protect designated uses, and/or antidegradation requirements for waters of the United States?
3. Does the provision express or establish the desired condition (e.g., uses, criteria) or instream level of protection (e.g., antidegradation requirements) for waters of the United States immediately or mandate how it will be expressed or established for such waters in the future?
4. Does the provision establish a new WQS or revise an existing WQS?

A. Implementation of narrative objective to protect Aquatic Life (Section IV.A. Benthic Community Protection).

EPA had previously approved the implementation of the narrative objective for aquatic life as a water quality standard on 8/27/2009. The State Water Board has made minor changes to the Chemical Score Index (CSI) which is one of two chemical indices used in the SQOs to assess chemical risk. The results for 12 chemical measurements are each binned into 4 categories based on empirical relationships between the chemical and benthic effects with Category 1 being reference and Category 4 being high. Each chemical is weighted based on the strength of the empirical relationships. The CSI is the weighted sum of the category scores.

The changes are to some of the category thresholds for 5 chemicals (See Table 2). The changes for Zinc and High molecular weight PAHs are minors (i.e., to the third sig figure). For total DDT, total DDE and Total DDD the thresholds for the High category were decreased substantially and the thresholds for Reference, Low and Moderate categories were increased. The weighting has also changed for all three DDT congeners.

Table 2. Category Score Concentration Ranges and Weighting Factors for the Chemical Score Index (recreated from Table 6 in SQO). Underline shows new thresholds and strikeout shows old thresholds.

Chemical	Units	Weight	Score (Disturbance Category)			
			1 Reference	2 Low	3 Moderate	4 High
Copper	mg/kg	100	≤52.8	> 52.8 to 96.5	> 96.5 to 406	> 406
Lead	mg/kg	88	≤ 26.4	> 26.4 to 60.8	> 60.8 to 154	> 154
Mercury	mg/kg	30	≤ 0.09	> 0.09 to 0.45	> 0.45 to 2.18	> 2.18
Zinc	mg/kg	98	≤ 11 <u>32</u>	> 11 <u>32</u> to 20 <u>10</u>	> 20 <u>10</u> to 629	> 629
PAHs, total high MW	µg/kg	16	≤ 31 <u>32</u>	> 31 <u>32</u> to 1325	> 1325 to 9320	>9320
PAHs, total low MW	µg/kg	5	≤ 85.4	> 85.4 to 312	> 312 to 2471	> 2471
Chlordane, alpha-	µg/kg	55	≤ 0.50	> 0.50 to 1.23	> 1.23 to 11.1	>11.1
Chlordane, gamma-	µg/kg	58	≤ 0.54	> 0.54 to 1.45	> 1.45 to 14.5	> 14.5
DDDs, total	µg/kg	<u>456</u>	≤ <u>0.7750</u>	> <u>0.7750</u> to <u>3.562.69</u>	> <u>3.562.69</u> to <u>26.37117</u>	> <u>26.37117</u>
DDEs, total	µg/kg	<u>334</u>	≤ <u>1.190.50</u>	> <u>1.190.50</u> to <u>6.014.15</u>	> <u>6.014.15</u> to <u>45.84154</u>	> <u>45.84154</u>
DDTs, total	µg/kg	<u>2046</u>	≤ <u>0.6150</u>	> <u>0.6150</u> to <u>2.791.52</u>	> <u>2.791.52</u> to <u>34.2789.3</u>	> <u>34.2789.3</u>
PCBs, total	µg/kg	55	≤11.9	> 11.9 to 24.7	> 24.7 to 288	> 288

To assess the effect of these changes EPA compared the chemical categorization to in published sediment guidelines (i.e., ERMs, PELs, SQGQ1 and Consensus Values). The use of the published sediment guidelines would place most sites in the SQO moderate to high exposure categories (coded orange and red in the table below). On a chemical per chemical comparison use of the individual CSI thresholds is as protective as existing guidelines from the literature.

Table 3. Summary of existing sediment guidelines from the literature. Colors indicate corresponding chemical disturbance categories using the Chemical Score Index (Diagonal Lines = Moderate, Horizontal Lines = High)

	units	ERM	PEL	SQGQ1	Consensus
Zinc	mg/kg	410	271	410	357.1
Total DDTs	ug/kg	46.1	51.7		25.4
HMW PAHs	ug/kg	9600	6676		

EPA finds that the changes to the category weighting and thresholds for the Chemical Score Index are protective of benthic communities.

2. Implementation of narrative objective to protect Human Health (Section VI.2.a)

EPA approved the following implementation language for the human health narrative objective in Section IV.A.2.a on 8/27/2009:

“The narrative human health objective in Section IV.B. of this part 1 shall be implemented on a case-by-case basis, based upon a human health risk assessment. In conducting a risk assessment, the Water Boards shall consider any applicable and relevant information, including California Environmental Protection Agency (Cal/EPA) Office of Environmental Health Hazard and Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA’s Department of Toxic Substance Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.”

In this new amendment the State Board has added the following implementation language for PCBs and chlorinated pesticides in Section IV.A.2.b:

“b. Approach to Interpret Objective for Chlorinated Pesticides and PCBs:

The methods and procedures described below shall be used to interpret the narrative objective described in Chapter III.A.2.b protecting human consumers of locally caught sportfish. These tools and associated assessment framework are intended to address the two components of the sediment quality objective protecting human consumers;

- Assess whether pollutant concentrations in sportfish pose unacceptable chemical exposure to human consumers and*
- Assess whether sediment contamination at a site is a significant contributor to the sportfish contamination.”*

These are assessed using a 3-tiered procedure. The first tier is an optional screening process where existing tissue and/or sediment data are screened using conservative thresholds. Fish tissue data concentrations of PCBs and chlorinated pesticides for a set of defined species are compared to tissue thresholds developed by the Office of Environmental Health Hazard Assessments (OEHHA). The data are pooled and the upper 95th confidence level concentration is compared to the Fish Contaminant Goal (FCG) which is the lowest OEHHA threshold (see Table 19). For sediment data the upper 95th confidence level sediment concentrations are compared to conservative sediment screen threshold based on default species-specific bio-sediment accumulation factors (BSAFs) from Table 17 (not reproduced here) and the FCG. A tier 2 evaluation is required if tissue exceeds the threshold and if tissue and sediment exceed the thresholds.

The second tier requires the collection of new data as specified in Table 18 (not reproduced here) of the sediment quality provisions. Tissue and lipid data are required from at least two species from different guilds and a minimum of three samples per species to estimate chemical exposure. The tissue concentrations are binned by comparing the average fish tissue concentration to the OEHHA FCGs and assessment threshold levels (ATLs) as describe in Table 19 and 20.

Table 19. Tier 2 Tissue contaminant thresholds (from OEHHA 2008)

Parameter	Tier 2 Contaminant Threshold			
	FCG ¹ (ng/g ww)	ATL3 ² (ng/g ww)	ATL2 ³ (ng/g ww)	ATL1 ⁴ (ng/g ww)
Total Chlordanes	5.6	190	280	560
Total DDTs	21	520	1,000	2100
Dieldrin	0.46	15	23	46
Total PCBs	3.6	21	42	120

Table 20. Tier 2 Chemical exposure categories

Tissue Contaminant Concentration	Threshold	Outcome
Average	< FCG	1. Very Low
Average	< ATL3	2. Low
Average	< ATL2	3. Moderate
Average	< ATL1	4. High
Average	> ATL1	5. Very High

Sediment and water column data are needed to support a constrained Gobas-Arnot Model. The site-specific data and model defaults provided in Appendix 8 of the Sediment Quality Provisions are used to calculate BASF for each fish species. The BASFs are used with a user defined site-use factor to calculate a site-linkage factor. A Monte-Carlo simulation is used to generate a distribution of site-use factors and results are classified based on whether strength of the linkage is very low, low, moderate or high as described in Table 21.

Table 21. Site Sediment Linkage Categories for Tier 2 Evaluation

Cumulative % of sediment linkage distribution above threshold	Linkage threshold	Outcome
0-25%	<0.5	1. Very Low
26-50%	<0.5	2. Low
51-75%	<0.5	3. Moderate
76-100%	≥0.5	4. High

Finally, the categorization for chemical exposure (Table 20) and for site-linkage (Table 21) are combined to evaluate the likelihood that fish are getting contaminants from sediments using the framework in Table 22 for site assessment. Sediments categorized as Unimpacted and Likely

Unimpacted meet the SQO. Sediments categorized as Likely Impacted or Clearly Impacted do not meet the SQO.

For 303(d) assessments of the human health objective, sites categorized as Possible Impacted, Likely Impacted or Clearly Impacted will be listed as impaired. For sites characterized as Possibly Impacted, confirmation monitoring may be conducted to verify if the impact is present.

Table 22. Site assessment framework. Shaded cells are considered impacted.

		Chemical Exposure				
		Very Low	Low	Moderate	High	Very High
Site Sediment Linkage	Very Low	Unimpacted	Unimpacted	Likely Unimpacted	Likely Unimpacted	Likely Unimpacted
	Low	Unimpacted	Unimpacted	Likely Unimpacted	Possibly Impacted	Likely Impacted
	Mod	Unimpacted	Likely Unimpacted	Likely Impacted	Likely Impacted	Clearly Impacted
	High	Unimpacted	Likely Unimpacted	Likely Impacted	Clearly Impacted	Clearly Impacted

Tier 3 is designed to address unique situations or evaluate additional factors affecting the assessment not considered in Tier 2. *“Tier 3 may be performed at any time provided that Tier 2 is completed at the same time. A change in any parameter or model from that used in Tier 2 must be justified based on site conditions in comparison to Tier 2 assumptions and values and approved by the Regional Water Board prior to performing the analysis.”*

To determine whether the implementing provisions for the narrative human health objective are WQS, EPA applied the 4-part test. 1. All three tiers are legally binding provisions, 2. All three tiers are protective of the human health objective, 3. All three tiers address how the narrative water quality will be expressed now, and in the future, and 4. All three tiers revise an existing water quality standard. EPA finds that Tiers 1, 2 and 3 are WQS pursuant to EPA approval.

3. Implementation Procedures for Wildlife and Resident Finfish

The Language in Section IV.A.3 titled Implementation of Wildlife and Resident Finfish states that

“The narrative wildlife and resident finfish* objectives in Section III.A.2 shall be implemented on a case-by-case basis, based upon an ecological risk assessment. In conducting an ecological risk assessment, the Water Boards shall consider any applicable and relevant ecological risk information, including policies and guidance from the following source:*

- *California Environmental Protection Agency’s (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA)*

- *Cal/EPA's Department of Toxic Substances Control (DTSC)*
- *California Department of Fish and Game*
- *U.S. Environmental Protection Agency*
- *National Oceanographic Atmospheric Administration*
- *U.S. Fish and Wildlife Service*

When threatened or endangered species are present in enclosed bays and estuaries, the Water Boards shall consult with State and/or Federal Resource Trustee agencies to ensure that species are adequately protected”.

To determine if the implementation procedures for the wildlife and resident finfish narrative is a water quality standard, EPA used the 4-part test. 1. It is not legally binding pursuant to state law as it is only implemented on a case-by-case basis, 2. It provides protection of the narrative criteria, 3. It does not establish a desired condition or mandate how it will be expressed, 4. It does revise the existing sediment quality objectives.

EPA finds that the implementation procedures for the narrative wildlife and resident finfish objective is not a water quality standard, but rather a process for Regional Boards implementing the narrative to coordinate with State and Federal Services in the implementation of the narrative where appropriate.

4. Other implementation procedures.

EPA finds that the following provisions in Sections IV.A.4 of the Sediment Quality Objectives are not WQS and do not require approval under 303(c).

- a) Implementation of Sediment Quality Objectives. This section states that each sediment quality objective is evaluated independently.
- b) Dredged Materials. This section clarifies that the Sediment Quality Objectives do not apply to dredging or dredge material disposal
- c) NPDES. This section identifies procedures for developing receiving water limits and effluent limits. This section also provides guidance on the exceedance frequency of receiving water limits and guidance on receiving water monitoring frequency
- d) Sediment monitoring and Assessment.
- e) Evaluating Waters for Placement of the Section 303(d) List. This section provides guidance for listing sediments under the Sediment Quality Objectives for Aquatic Life and Human Health

5. Non-Substantive provisions.

EPA considers non-substantive edits to existing WQS to constitute new or revised WQS that EPA has the authority and duty to approve or disapprove under CWA section 303(c)(3).¹ EPA believes that it is reasonable to treat such non-substantive changes in this manner to ensure public transparency as to which provisions are effective for purposes of the CWA. These include non-substantive edits to text, changes to figure and table numbering, and changes to the table of contents. EPA is approving these revisions under CWA 303(c) authorities. EPA is not taking action on any changes to implementation provisions under Section IV.A.4 as these are not water quality standards.

V. Summary

EPA staff find that the narrative objectives for Human Health and for Wildlife and Resident Finfish are WQS subject to EPA approval. EPA also finds that the three-tiered implementation process for the Human Health narrative is also a water quality standard subject to EPA approval. Finally, EPA finds that the implementing provisions for the Wildlife and Resident Finfish narrative are not WQS subject to EPA approval.

Public Participation

EPA compliments the State on its efforts to include the public in the development and review of new and revised WQS. Public involvement is an integral component of a successful water quality program. Based upon our review, the public review procedures followed by the State in the development of State Board Resolution No. 2018-0028 were consistent with the procedural requirements for public participation in triennial reviews, adoption, and revision of state WQS.

ESA Consultation with the Services on EPA's Action

FOR HUMAN HEALTH STANDARDS: Section 7(a)(2) of the ESA states that each federal agency shall ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened (listed) species or result in the destruction or adverse modification of critical habitat. EPA's "Recommended Approaches to Improve Endangered Species Act (ESA) Consultation on Approvals of State and Tribal Water Quality Standards," dated January 16, 2009, states that ESA consultation requirements do not apply to actions where EPA lacks discretion to protect species, or where an EPA action has no effect on listed species or critical habitat. For ESA section 7(a) to apply, EPA must be taking an action in which it has sufficient discretionary federal involvement or control to protect listed species. EPA has concluded that it lacks sufficient discretionary federal involvement or control to protect listed species when it approves state WQS actions to protect human health; human health standards are designed to protect humans, not plants or other animals. EPA's discretion to act on a state submission concerning human health is limited to determining whether the

¹ What Is a New or Revised Water Quality Standard Under CWA 303(C)(3)? Frequently Asked Questions October 2012
<https://www.epa.gov/sites/production/files/2014-11/documents/cwa303faq.pdf>

submission protects human health. EPA has no discretion to revise an otherwise approvable human health standard to benefit listed species.

This amendment provides implementation provisions for the human health narrative. The use is meant to protect people from pollutants in fish that might accumulate at concentrations that affect fish consumption in California's Bays and Estuaries. Since the Basin Plan amendment to remove the use concerns human health, EPA lacks sufficient discretionary involvement or control to protect listed species. Therefore, compliance with the ESA is not applicable.

FOR NARRATIVE AQUATIC LIFE STANDARD: The narrative objective for wildlife and resident finfish will have no effect on threatened or endangered species. The new narrative prohibits the accumulation of toxics in sediments that would either be directly toxic to or bioaccumulate in resident finfish or wildlife. This narrative does not replace or supplant any existing narrative, but rather clarifies that existing narratives prohibiting toxics in toxic amounts also apply to sediments and explicitly includes negative bioaccumulative effects in the definition. Where endangered species are present, the Regional Water Boards are required to consult with both state and federal resource agencies.

The implementation procedures provide clear guidance to the Regional Water Boards that both state and federal resource agencies must be involved in any actions implementing the narrative when threatened or endangered species are present. EPA staff has informally discussed our ESA obligations on this narrative and both the National Marine Fisheries Service and the US Fish and Wildlife Services suggested that a no effect determination would be reasonable. Therefore, EPA has determined that our action will have no effect on any federally listed threatened or endangered species, or on any listed critical habitat, under the ESA.

REFERENCES

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