CALLEGUAS CREEK
Watershed Management Plan

A COOPERATIVE STRATEGY FOR RESOURCE MANAGEMENT & PROTECTION

February 16, 2017

Electronic Submission: commentletters@waterboards.ca.gov

Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Delivered electronically: commentletters@waterboards.ca.gov

Subject: Comment Letter -- Beneficial Uses and Mercury Objectives

Dear Ms. Townsend,

The Stakeholders Implementing Total Maximum Daily Loads in the Calleguas Creek Watershed (Stakeholders) appreciate the opportunity to provide comments on the *Draft Staff Report, including substitute environmental documentation for Part 2 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California – Tribal Subsistence Fishing Beneficial Uses and Mercury Provisions* (referred to hereinafter as the Draft Staff Report) which was distributed for public review on January 4, 2017. The Stakeholders consist of agricultural, wastewater, and MS4s that are responsible parties to five effective Total Maximum Daily Loads (TMDLs) in the Calleguas Creek Watershed (CCW).

The Stakeholders understand that the State Water Resources Control Board (State Water Board) is proposing to establish (a) three new beneficial use definitions pertaining to tribal traditional and cultural use (CUL), tribal subsistence fishing use (T-SUB), and subsistence fishing use (SUB); (b) one narrative and four numeric mercury water quality objectives to protect numerous beneficial uses of water involving human health and aquatic dependent wildlife; and (c) a program of implementation to control mercury discharges. The Stakeholders developed and are currently implementing a metals TMDL which includes mercury within the CCW[1]. The Stakeholders have invested significant resources in developing and implementing this TMDL to ensure protection of human health, aquatic life, and wildlife beneficial uses in the watershed. The Stakeholders undertook the responsibility for developing the TMDL to allow incorporation of the extensive local knowledge of the watershed and we take great interest in ensuring the proposed mercury provisions and new beneficial uses allow protection of human health and wildlife based on local information. Herein we provide comments on the Draft Staff Report proposed beneficial uses and mercury provisions as they relate to the CCW and the existing metals TMDL.

1. Adjust the process and timeline for adoption of the proposed mercury objectives and beneficial uses to allow more time for public review

The Stakeholders understand that the State Water Board is proposing to align the adoption of the mercury objectives and beneficial uses with the timeline stipulated within the U.S. EPA Consent Decree[2] so that U.S. EPA's obligation to establish the mercury water quality criteria for aquatic life and aquatic-dependent wildlife would also be satisfied by the June 30, 2017 deadline. However, the beneficial uses and human health mercury water quality objectives were not included in the Consent Decree language and therefore there is nothing preventing the State Water Board from bifurcating those components of the Draft Staff Report to allow time for a robust public review process. As the schedule now stands, affected parties are allowed only 30 days and one *public hearing* to review and comment on the Draft Staff Report, a 700+ page document.

Considering the broad scope of the proposed action, including the adoption of multiple mercury numeric and narrative water quality objectives, the creation of new beneficial uses, the interplay with in-stream flow requirements (which was the subject of a February 1st workshop), and the actions within the implementation plan, the Stakeholders encourage the State Water Board to work with U.S. EPA to either:

(1) Allow an extension of the time for the U.S. EPA Consent Decree <u>and</u> additional steps to the public process for this rulemaking; or
(2) Bifurcate the U.S. EPA obligation to develop water quality criteria for wildlife (the proposed prey fish and California least tern prey fish objectives) by June 30, 2017, from the remaining portion of the proposal <u>and</u> add additional time and steps to the public process for the remaining portions of this rulemaking.

This alteration of the schedule will allow the Stakeholders and other affected groups to fully consider the effects of the proposed actions while still complying with the schedule outlined in the U.S. EPA Consent Decree.

Requested Action: Pursue Option 1 or 2 above and amend the schedule as follows:

- **Extend the public comment period by 60 additional days to mid-April 2017;**
- **Postpone the State Water Board's first hearing on this issue until May 2017;**

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[1] *Amendment to the Water Quality Control Plan for the Los Angeles Region to Incorporate a Total Maximum Daily Load for Metals for the Calleguas Creek, its Tributaries, and Mugu Lagoon.* Resolution No. R4-2006-012. June 8, 2006.

[2] *Our Children's Earth Foundation and Ecological Rights Foundation vs. U.S. EPA*, No. 3:13-cv-2857-JSW (2014).

- **Provide additional opportunity for the submission of written public comments on any revisions; and**
- **Hold a final hearing for consideration of adoption fall 2017.**

2. Clarify the description of CCW TMDL to demonstrate reevaluation is not necessary

The Stakeholders understand that the proposed mercury objectives are meant to protect wildlife and human health in areas that are not already protected by an existing TMDL as stated "*the implementation requirements in the Provisions do not supersede the mercury TMDLs and their programs of implementation because the site-specific water quality objectives are essentially the same as those in the Provisions*"[3]. The Draft Staff Report goes on to state that "*the implementation actions required by the Provision would not apply to dischargers that discharge to receiving waters for which a mercury or methylmercury TMDL has been adopted and the Provisions would not supersede any part of such TMDLs*[4]". Such TMDLs including CCW are listed in Table 3-3 of the Draft Staff Report. We agree with the State Water Board that existing TMDLs that include wildlife targets should already be protective of the water bodies and therefore should not be affected by the proposed mercury provisions. However, the CCW TMDL is later noted to be an exception and should be considered for reevaluation because "*Calleguas Creek TMDL ...has effluent limitations for point source discharges that are based on the California Toxics Rule criteria*[5]" and to adjust the human health fish tissue target to "*make the targets more consistent statewide*[5]" by using a higher fish consumption rate. In addition, there are several incorrect statements made about the CCW TMDL, including that "*the Calleguas Creek/Mugu Lagoon TMDL . . . does not include a quantitative source analysis.*[6]"

The Stakeholders would like to clarify the misrepresentation of the CCW TMDL and disagree with the need to reevaluate the TMDL based on the draft provisions. The CCW Metals TMDL was developed utilizing a HSPF model based on a dataset that included data from receiving water monitoring locations throughout the watershed as well as wastewater, urban, and agricultural dischargers. The model was utilized to develop a quantitative source analysis and develop TMDL allocations. The analysis described in the CCW Metals TMDL Technical Report[7] demonstrates that point source discharge effluent limitations are based on an extensive technical analysis designed to ensure that all TMDL targets would be met, including the fish tissue and bird egg targets designed to protect wildlife. The allocation process ensured that the most stringent target was achieved, which meant, in some cases, that the allocations were based on the CTR criteria because they were more stringent than the other targets. (See Attachment A, p. 157 for a full description of the allocation process). While the Draft Staff Report is correct that the CTR criteria were applied to some point source dischargers it is unclear why this

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[3] P. 34 Draft Staff Report
[4] P. 37 Draft Staff Report
[5] PP. 39-40 Draft Staff Report
[6] Appendix N, P. N-14 Draft Staff Report
[7] *Calleguas Creek Watershed Metals and Selenium TMDL.* Draft Final Technical Report. March 29, 2006. http://tinyurl.com/zdnodsx [CCW Technical Report]

warrants reconsideration when the CTR criteria were chosen based on a detailed source assessment and load allocation analysis.

Furthermore, an assessment of mercury loads spanning from 1993 to 2003 found that publicly owned treatment works (POTWs) represented only 2% of the estimated total mercury loading based on land use[8]. The modeled waste load allocations values for POTW and other point source dischargers were found to be *negligible under most circumstances*[9]. Therefore, utilizing resources to reevaluate a TMDL to modify allocations for insignificant discharges is unwarranted.

Finally, no evidence is provided in the Draft Staff Report to demonstrate that the fish consumption rate assumed in CCW is too low. Additionally, the Draft Staff Report notes that modifying the consumption rate would not modify the implementation provisions or allocations in the TMDL. Modifying a TMDL developed based on extensive local information is not warranted to provide "statewide consistency."

Given the extensive analysis and significant resources invested by the Stakeholders in the TMDL and a lack of evidence that modifying the TMDL would offer further protection of beneficial uses, nothing in the new provisions should necessitate a reevaluation of CCW waste load allocations as the TMDL is already "*expected to achieve an appropriate level of protection for humans and wildlife*[4]" and "*the site-specific water quality objectives are essentially the same as those in the Provisions*[3]".

Requested Action:

- **Remove the first paragraph under Table 3-3 on page 39 discussing the Calleguas Creek TMDL or at a minimum the last two sentences of the paragraph that discuss the reevaluation.**
- **Remove the last two sentences of the second paragraph on page 40 discussing the potential revisiting of the CCW TMDL fish consumption rate.**
- **Remove the following sentence from Appendix N, page N-14 in the first paragraph under section N.2.1: "*Of those three TMDLs, the Calleguas Creek/Mugu Lagoon TMDL (Los Angeles Water Board 2006) does not include a quantitative source analysis.*"**

3. Clarify application of implementation provisions when a TMDL exists

The Stakeholders request clarification regarding the implementation of the proposed mercury provision to *upstream water bodies* of an existing TMDL. Per the Draft Staff Report mercury implementation provisions do not apply to waters for which a mercury TMDL is established. However, the implementation provisions will apply to receiving waters upstream of a TMDL

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[8] Table 53, p. 95 of the Technical Report

[9] P. 162 CCW Technical Report

area "*even if the TMDL contains waste load allocation for the dischargers to the upstream water bodies to be implemented as effluent limitations to achieve the downstream water quality standard*"[10].

The Stakeholders feel the discussion on upstream water bodies needs to be clarified. In the CCW TMDL, all waterbody reaches were evaluated, regardless of 303(d) listing status, and allocations were assigned based on where impairments were identified. In some reaches, the assessment resulted in a finding that impairments did not exist and allocations were only developed if necessary to protect downstream waterbodies. However, targets were assigned to all reaches in the CCW TMDL. In other TMDLs, the assessment was only conducted for a downstream reach and included waste load allocation to upstream receiving waters. In cases like the CCW TMDL where the upstream waters were thoroughly assessed, assigned targets, and found not to be in exceedance for mercury, the proposed mercury provisions should not apply. As it is currently defined in the Draft Staff Report, it is unclear if these waters would fall under the definition of the Draft Staff Report of *upstream water bodies* for which the proposed mercury provisions implementation requirements would apply.

Requested Action:

- **Clarify language discussing *upstream water bodies* in the Draft Staff Report and Appendix A (pp. 38 and A-8). Specifically modify footnote 17 on page A-8 as follows:**
  "Such "receiving waters" are defined as those that have been assessed as part of an approved mercury or methylmercury TMDL, including those for which impairments were not found in the analysis. If the TMDL includes allocations for upstream dischargers to waterbodies not assessed in the TMDL, the implementation provisions may apply if necessary to protect the waterbody to which the discharge occurs."

4. Clarify State Water Board ability to designate Elevated Mercury Areas

The Draft Staff Report includes a definition for an area with elevated mercury concentrations that drives required actions for municipal stormwater and agricultural dischargers. The definition includes five different categories (pp. A-15 and B-5). The first two definitions include threshold levels of mercury in the sediment and the second two categories are focused on identified high mercury sources. However, the fifth definition states "*Any other area(s) as determined by the Water Boards in the applicable order*". While we agree that there may be other localized areas that the Water Boards may need to designate to address mercury, the designation should be subject to the same thresholds of mercury as the first two definitions.

[10] P. A-8 Draft Staff Report

Requested Action:

- **Include a threshold concentration of 1mg/kg or higher in the definition on page A-15:**
  "5) Any other area(s) *with a total mercury concentration of 1mg/kg or higher* as determined by the PERMITTING AUTHORITY in the applicable order"
- **Include a threshold concentration of 1mg/kg or higher in the definition on page B-5:**
  "5) Any other area(s) *with a total mercury concentration of 1mg/kg or higher* as determined by the Water Boards in the applicable order"

5. Include more definition and guidance on the application of the new beneficial uses

The proposed amendments to the Inland Surface Waters Plan and the Draft Staff Report do not provide sufficient direction on the process for designating waterbodies with the new beneficial uses, the data and information needs necessary to make the designations, or guidance on the scope of water quality objectives that could be applied to protect the beneficial uses. While the Stakeholders support and understand the need to create these beneficial uses, we feel it is critical that the definitions and process for designating the uses be clear and that a clear linkage be made between the beneficial uses and the water quality objectives assigned to protect the beneficial uses. We also feel it is important that an evaluation of beneficial uses and the associated water quality objectives be done in consideration of all factors in California Water Code (Wat. Code) § 13241, including *"(c)the consideration of water quality conditions that could be reasonably attained through coordinated control of all factors affecting water quality"*. For example, the Tribal Tradition and Culture Use (CUL) are "*uses of water that support the cultural, spiritual, ceremonial, or traditional rights or lifeways of California Native American Tribes, including, but not limited to: navigation, ceremonies, or fishing, gathering, or consumption of natural aquatic resources, including fish, shellfish, vegetation, and materials.*[11]" Considering that many of California's waterbodies have been highly modified over the years, the Stakeholders struggle to see how this beneficial use could be protected, maintained, or attained in many circumstances.

To address these concerns, the Stakeholders request that the proposed amendments include a process for designating the beneficial uses that lists the multiple factors to be considered and the minimum data and information needed to make the designation. The process should include the requirement to conduct a Use Attainability Analysis (UAA) as described in 40 C.F.R., 131.10(g). A UAA is required when a state designates uses that do not include the uses specified in section 101(a)(2) of the Clean Water Act (CWA), typically called fishable and swimmable beneficial uses. None of the three new designated uses would fall under this designation and therefore a UAA should be required prior to making the designations. In addition, the Stakeholders suggest formalizing the process for gathering input from the California Native American Tribes to better support their involvement in the designation process. The Stakeholders request that the State Water Board include a two-step designation process for the CUL and T-SUB beneficial uses. The process would involve:

[11] P. 6 Draft Staff Report

(1) California Native American Tribes identifying the types of activities which would qualify a water body for a CUL or T-SUB designation and proposing a process for evaluating waterbodies for those uses. The types of activities and process would then be made available for public comment and input and approved by the applicable Water Board.
(2) Once the activities and processes have been approved, the applicable Water Board would utilize the approved input from the California Native American Tribes to select waterbodies to consider for designation and then conduct a UAA to determine which waterbodies to designate with the new uses.

This process would maximize the involvement of the tribes while also supporting a standardized definition and implementation of the new tribal beneficial uses.

The Stakeholders also request consideration of clarifying the definitions of the beneficial uses consistent with the definition of "Tribal cultural resources" included in CEQA Assembly Bill no. 52 (Gatto, 2014) passed on September 25, 2014. While the CEQA definition may not be fully applicable to beneficial use designations, the definition is much clearer and can be more directly linked to specific locations where protection is necessary.[12] As part of the clarification of the beneficial use definition, the Stakeholders also request a consistency change to the CUL beneficial use definition. Appendix A of the Draft Staff Report outlines the definitions of the three newly proposed beneficial uses and clarifies that the function of T-SUB and SUB beneficial uses "*is not to protect or enhance fish populations or aquatic habitats*[13]" since these uses would be protected under other designations. The Stakeholders appreciate this clarification and request that this language should also include the CUL beneficial use as the same rationale applies to the CUL beneficial use as to the T-SUB and SUB beneficial uses.

Requested Actions:

- **Revise the proposed Inland Surface Waters Plan language and the Draft Staff Report to identify minimum data and information requirements and the multiple factors that Water Boards need to consider prior to designating a waterbody with any of the newly proposed beneficial use designations.**
- **Include a description of the two-step process for defining Tribal (CUL and T-SUB) beneficial uses as described above, including a requirement to conduct a UAA as part of the designation process.**

[12] AB 52 Definition of Tribal cultural resources is as follows:
A Tribal Cultural Resource is (PRC 21074):

- A site feature, place, cultural landscape, sacred place or object, which is of cultural value to a Tribe
- AND is either: On or eligible for the CA Historic Register or a local historic register
- OR the lead agency, at its discretion, chooses to treat the resource as a tribal cultural resource

[13] P. A-3 Draft Staff Report

- **Consider clarifying the Tribal Tradition and Culture (CUL) beneficial use consistent with CEQA AB52 definition of *Tribal Cultural Resource* as described above.**
- **Change the language in Appendix A page A-3 to read as follows:**
  "The function of the Tribal Subsistence Fishing, Subsistence Fishing, *and Tribal Tradition and Culture* beneficial uses is not to protect or enhance fish populations or aquatic habitats."

The Stakeholders appreciate the opportunity to comment on the Draft Staff Report and look forward to continuing to work with the State Water Board on developing the new beneficial uses and mercury objectives. Thank you for your time and consideration of these comments. If you have questions, please contact me at (805) 388-5334.

Sincerely,

Lucia M. McGovern

Lucia McGovern
Chair of Stakeholders Implementing TMDLs in Calleguas Creek Watershed

cc: Stakeholders Implementing the TMDLs in Calleguas Creek Watershed

Attachment A: 2006 CCW Metals TMDL Technical Report Allocation Excerpt

M A R C H   2 9 , 2 0 0 6

Calleguas Creek Watershed Metals and Selenium TMDL

Draft Final Technical Report

Submitted to Los Angeles Regional Water Quality Control Board
and the United States Environmental Protection Agency

Prepared By

Larry Walker Associates

on Behalf of the Calleguas Creek Watershed Management Plan

10.1 Approach - Mercury TMDL & Allocations

The mercury TMDL is designated as a reduction in loading of mercury on suspended sediment, based upon percent reductions required to achieve numeric target concentrations for water and fish tissue. In order to translate required reductions in fish tissue and water column concentrations into suspended sediment mercury load reductions, it is assumed that a given percent reduction in water or fish tissue concentration results in a proportional percent reduction in suspended sediment mercury loads. The basis for this assumption is presented in the Linkage Analysis. The validity of this assumption will be evaluated by special studies included in the Implementation Plan and allocations adjusted if necessary to ensure compliance with numeric targets and achievement of beneficial uses.

The TMDL for mercury is developed according to the approach detailed below:

1. compare average mercury fish tissue concentrations in available data to numeric targets and calculate percent reduction required;
2. use HSPF model output to calculate percent reduction required for the annual maximum 30-day average mercury concentration in water to meet CTR, for each year of available data;
3. designate overall percent reduction representative of tissue concentrations and 30-day average water concentrations;
4. use HSPF model output to calculate current loads of mercury entering Mugu Lagoon on suspended sediment for each year of available data;
5. set allowable load equal to the current load * 1 - percent reduction (from step 3)
6. establish TMDL as allowable load of mercury on suspended sediment according to low, medium, and high annual flow scenarios.
7. allocate the allowable load to all sources based on proportional loading contributions.

Current and allowable loads are developed based on modeling of particulate-associated loading and the percent reduction required to meet numeric targets for water and fish tissue. Multiple allowable loads are defined according to low, medium, and high annual flow scenarios.

Alternatives Considered

Several alternative approaches were considered for developing the mercury TMDL and associated allocations, which are described briefly below.

Set TMDL and allocations as total mercury loads in water.

Deemed inappropriate because mercury in water is almost completely associated with particulate matter, and also because allocating loads in water is not practical for most sources in the watershed.

Include consideration of mercury loads in streambed sediment in addition to suspended sediment.

Reliable estimates of sediment transport in the CCW do not seem to exists, currently available estimates vary dramatically. Plus, the vast majority of sediment transport is captured in calculations of suspended sediment transport, and the high degree of interaction between suspended sediment and bottom sediment ensures comparable mercury concentrations exist.

10.2 Critical Conditions & Seasonal Variation - Mercury

The Clean Water Act stipulates a TMDL must appropriately consider and account for seasonal variations and critical conditions. Sediment concentrations generated by the Mugu Lagoon Metals and Selenium Model (MLMSLM) offer no indication that mercury contamination in the lagoon is consistently worse at any particular time of year. Since the potential effects of mercury are related to bioaccumulation in the food chain over long periods of time, any other short term variations in concentration which might occur are not likely to cause significant impacts upon beneficial uses. Therefore, concern about seasonal variability is not relevant for the CCW mercury TMDL. However, there is substantial variability in annual precipitation which directly affects the amount of sediment and water delivered into Mugu Lagoon across years. Given that allocations for this TMDL are expressed in terms of annual mercury loads in suspended sediment, the critical condition identified is total annual flow. The proposed load and waste load allocations represent long-term averages of annual loads based on varying annual precipitation and annual flow conditions. The implementation plan for mercury acknowledges and accommodates long-term inter-annual variability by evaluating whether sources are meeting allocations on a multi-year basis. Long-term averages help smooth out differences among high and low rainfall years.

10.3 Current Loads and Loading Capacity - Mercury

Since the mercury TMDL is designated according to a necessary percent reduction (PR), current loads are first developed then and categorized according to low, medium, and high annual flows. Figure 58 shows total annual loads of mercury in suspended sediment for each year from 1993-2003 (each year is calculated from October through September of the following year). The loads presented for Mugu Lagoon are based on concentrations in the lagoon itself, generated by the Mugu Lagoon Metals and Selenium Model (MLMSM); while the loads presented for Revolon Slough plus Calleguas Creek are based on concentrations discharged into Mugu Lagoon from the base of Revolon Slough and Calleguas Creek, generated by the HSPF model. Operation of each model is explained briefly in the Linkage Analysis section, and detailed in Appendix C, Appendix D, and Appendix E.

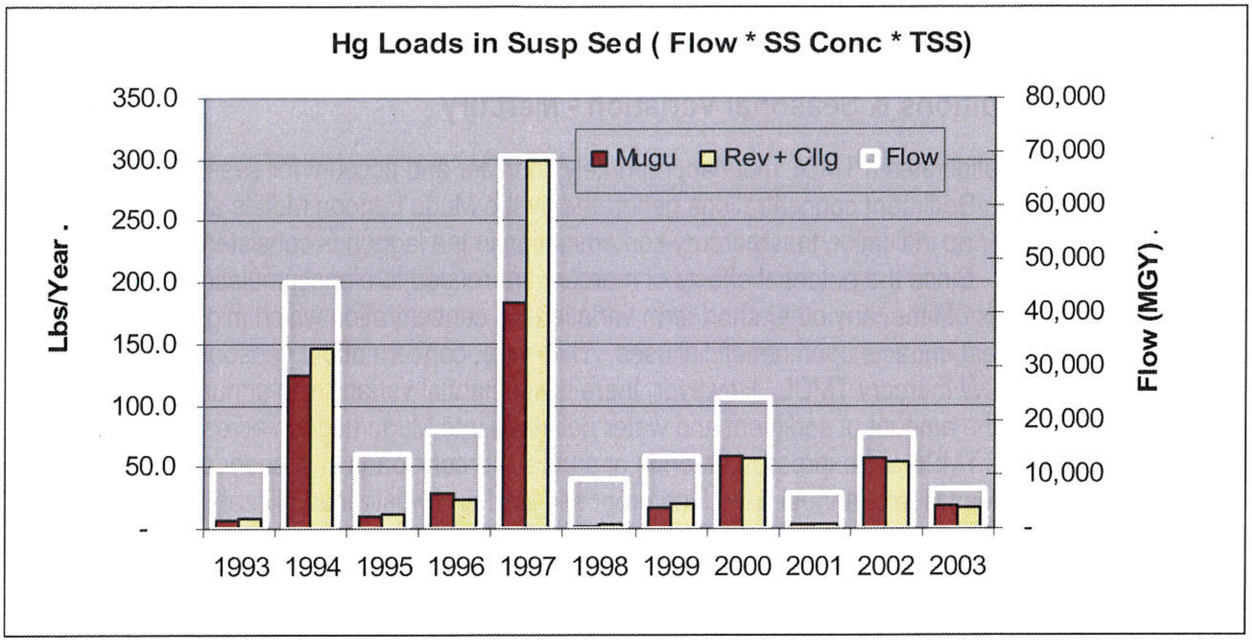

Figure 57. Annual loads of mercury in suspended sediment and associated annual flows in millions of gallons per year, for the years 1993 – 2003.

Figure 58 shows the same loadings shown above, sorted according to low, medium, and high annual flow categories. Low annual flow is defined as less than 15,000 million gallons per year (MGY), medium annual flow is defined as 15,000 – 25,000 MGY, and high flow defined as greater than 25,000 MGY.

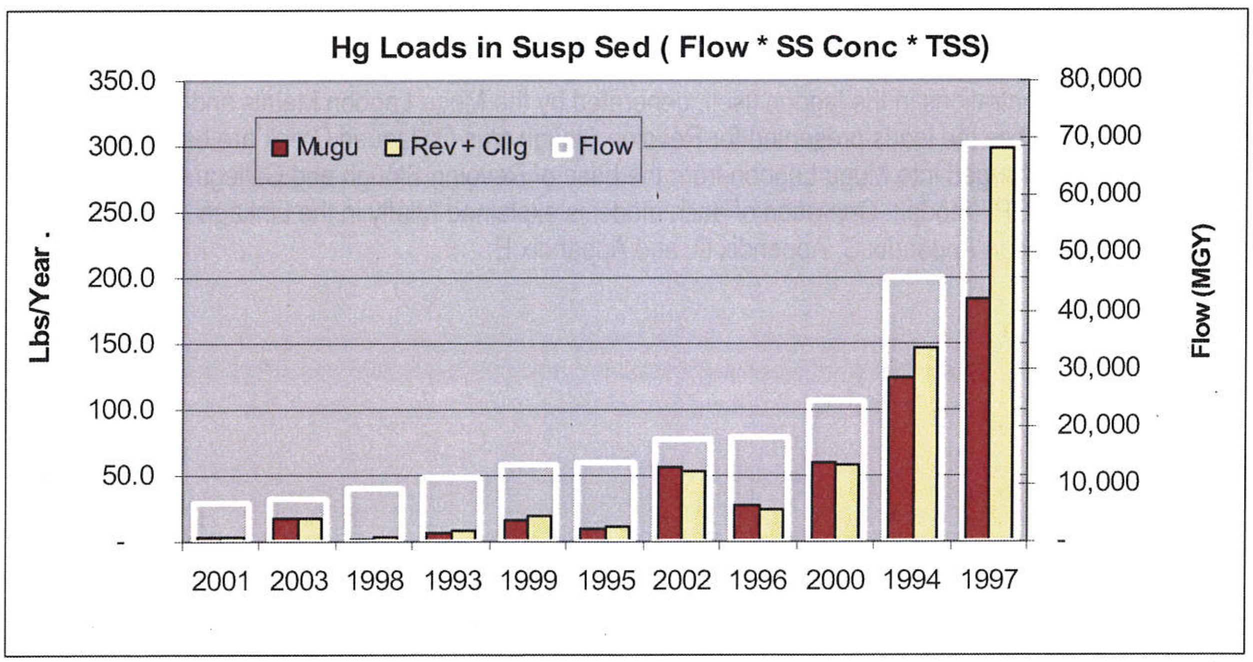

Figure 58. Total annual loads of mercury in suspended sediment (pounds per year), and associated annual flows in millions of gallons per year; sorted according to low, medium, and high annual flow years.

Loading capacity is calculated based on the 80% percent reduction necessary to achieve numeric target concentrations in the water column and fish tissue, as explained in the Linkage Analysis section. Loading capacities for mercury in suspended sediment for Revolon Slough and Calleguas Creek are presented below in Table 82, according to the annual flow categories described above. The loading capacity for each flow category is calculated as an 80% reduction from the average of all years occurring in each flow category.

Table 82. Current Loads and Loading Capacity for Mercury in Suspended Sediment for Mugu Lagoon, Revolon Slough, and Calleguas Creek; According to Annual Flow Category.

Waterbody / Reach	Flow Category [1]	Critical Condition Flow [2] (MGY)	Current Loading [3] (Lbs/Yr)	Loading Capacity [4] (Lbs/Yr)
Mugu Lagoon (sum of loads from Revolon and Calleguas)	Low	9,551	10.5	2.1
	Medium	17,863	44.8	9.0
	High	57,497	222.9	44.6
Revolon (at PCH)	Low	3,862	2.6	0.5
	Medium	6,669	13.6	2.7
	High	15,275	36.0	7.2
Calleguas (at PCH)	Low	5,687	7.9	1.6
	Medium	11,859	31.2	6.2
	High	38,489	186.9	37.4

[1] Flow categories, in millions of gallons per year (MGY): low (less than 15,000), medium (15,000 - 25,000), high (greater than 25,000).

[2] Mean annual flow for all years in each flow category, individual flows for Revolon and Calleguas not totaled here.

[3] Current mean annual load of mercury in suspended sediment for all years in each flow category.

[4] Average allowable annual load of mercury in suspended sediment for all years in each flow category, based on 80% reduction from current loads.

10.4 Allocations - Mercury

Allocations of mercury in suspended sediment to individual sources are assigned based on proportional loading contributions in water, for the following reasons: the load of total mercury in water is approximately equivalent to the suspended sediment load; and estimates of mercury concentrations on suspended sediment according to land use type are not available.

Background Load

As discussed in the Source Analysis section, the primary ambient sources of mercury are natural soil concentrations and atmospheric deposition. Although ambient sources of mercury are a component of the discharge from all land use types (including agricultural, urban, and open space runoff), only loads from undeveloped open space and natural groundwater seepage are unaffected by anthropogenic influences (because human activity on agricultural and urban lands can affect the mobilization of ambient mercury sources). Thus, calculation of the background load for the mercury TMDL includes only the contribution of mercury from open space ambient sources.

Loading of mercury from erosion and transport of natural soils [from all land use types] was estimated in the Source Analysis section to contribute about **54** pounds of mercury per year to receiving waters of the CCW (based on GIS analysis, using long term average annual precipitation and flow data). Estimates of the background load [from open space only] generated separately using the HSPF model are presented below in Table 83. Since about half of the CCW is open space, these two different methods yield comparable estimates of the background load during average/medium annual flow conditions (from text above, 54 * 0.5 = 27 lbs/yr; from the table below, 19.2 lbs/yr). The background loads shown in Table 83 represent about 40-50% of the total mercury loading to Mugu Lagoon, with Calleguas Creek contributing a greater share of the total than Revolon Slough.

Table 83. Background Load of Mercury for Each Flow Category, estimated by HSPF model.

Reach	Annual Flow	Current Loading [1] (Lbs/Yr)	Background Load (Lbs/Year)	Percent of Current Load
Mugu Lagoon (sum of loads from Revolon and Calleguas)	Low	10.5	4.7	45%
	Medium	44.8	**19.2**	43%
	High	222.9	99.7	45%
Revolon (at PCH)	Low	2.6	1.1	42%
	Medium	13.6	5.5	40%
	High	36.0	10.2	28%
Calleguas (at PCH)	Low	7.9	3.3	46%
	Medium	31.2	13.7	44%
	High	186.9	89.5	48%

1 See Table 82, above.

Waste Load and Load Allocations

The total allowable load for mercury is allocated to agricultural runoff, urban runoff, POTWs, and the background load. Allocations for agricultural and urban runoff are based on proportional contributions estimated by the HSPF model. POTW allocations are based on the design flow and 90th percentile concentration observed in effluent discharge, and apply to all flow conditions. Background load allocations are based on the HSPF estimates presented above.

Table 84 shows current average annual loads for each source in Calleguas Creek and Revolon Slough, according to annual flow category. Final and interim WLAs and LAs for mercury in suspended sediment are presented in Table 85, and the model output for individual years used to determine interim WLAs and LAs is presented in Table 86. Significant reductions in background loading, although likely impracticable, are necessary for achievement of WLAs and LAs. Thus, the percent reduction for mercury loads in the CCW (explained in the Linkage Analysis section) is applied to the background load as well as to agricultural and urban sources.

Table 84. Current Mercury Loads for Sources Discharging to Calleguas Creek and Revolon Slough (Lbs/Yr).

Reach	Source	Annual Flow Condition		
		Low	Medium	High
Calleguas Creek	Agricultural Runoff [2]	2.4	9.4	56.1
	Urban Runoff [2]	2.0	7.8	46.7
	Background (Open Space) [2]	3.3	13.7	89.5
	Hill Canyon WQCP[1]	0.26 - 2.76 lbs/year		
	Camarillo WRP[1]	0.18 - 0.36 lbs/year		
	Simi Valley WWTP[1]	0.37 - 2.16 lbs/year		
Revolon Slough	Agricultural Runoff [2]	0.8	4.1	10.8
	Urban Runoff [2]	0.7	3.4	9.0
	Background (Open Space) [2]	1.1	5.5	10.2
Total Loading to Mugu Lagoon [3]		10.3	43.9	222.3

1 Current loads for the POTWs are based on the design flow and the range of values from the median concentration to the 90th percentile concentration observed in the effluent discharge. Design flows for POTWs in the CCW are as follows: Hill Canyon 10.2 MGD (expanding to 14 MGD by approximately 2018), Camarillo 6.75 MGD, Moorpark 3 MGD, Simi Valley 12.5 MGD (expanding to 17.5 MGD by 2012), Camrosa 1.5 MGD.

2 Loads attributed to sources according to HSPF estimates.

3 Not including POTWs, since a range of loading values are presented above for POTWs; and because POTW loads are negligible under most circumstances.

Table 85. Final and Interim Annual WLAs and LAs for Mercury in Suspended Sediment (Lbs/Yr).

Reach	Source	Final WLAs and LAs, According to Annual Flow Categories			Interim WLAs and LAs, According to Annual Flow Categories		
		Low	Medium	High	Low	Medium	High
Calleguas Creek	Agricultural Runoff [2]	0.5	1.9	11.2	3.9	12.6	77.5
	Urban Runoff [2]	0.4	1.6	9.3	3.3	10.5	64.6
	Background (Open Space) [2]	0.7	2.7	17.9	5.5	17.6	108.4
	Hill Canyon WQCP[1]	0.022 lbs/month (0.26 lbs/year)			0.23 lbs/month (2.76 lbs/year)		
	Camarillo WRP[1]	0.015 lbs/month (0.18 lbs/year)			0.03 lbs/month (0.36 lbs/year)		
	Simi Valley WWTP[1, 3]	0.031 lbs/month (0.37 lbs/year)			0.18 lbs/month (2.16 lbs/year)		
Revolon Slough	Agricultural Runoff [2]	0.2	0.8	2.2	2.0	4.8	12.2
	Urban Runoff [2]	0.1	0.7	1.8	1.7	4.0	10.2
	Background (Open Space) [2]	0.2	1.1	2.0	2.9	6.7	17.1
Total Load Discharged to Mugu [4]		2.1	8.7	44.4	19.3	56.2	290.0

1 Waste load allocations for POTWs are based on the median monthly mercury effluent concentrations multiplied by the design flow, where the total load in water is assumed equal to the suspended sediment load. Interim allocations are based on the design flow and the 90th percentile concentration observed in the effluent discharge and apply to all flow conditions. Design flows for POTWs in the CCW are as follows: Hill Canyon 10.2 MGD (expanding to 14 MGD by approximately 2018), Camarillo 6.75 MGD, Moorpark 3 MGD, Simi Valley 12.5 MGD (expanding to 17.5 MGD by 2012), Camrosa 1.5 MGD.

2 Final allocations for all sources other than POTWs are set 80% reduction from HSPF load estimates. Interim load allocations are set equal to the highest annual load within each flow category, based on HSPF model output for the years 1993-2003.

3 Loads for the Simi Valley WWTP apply only during wet weather months (October-March). If

4 Not including POTWs, since a range of loading values are shown above; and because POTWs loads are negligible under most circumstances.

Table 86. Basis for Interim Limits, Highest Annual Mercury Load for Each Flow Category from HSPF model results.

Year	Crrnt Annl Ld, Susp.Sed. (lbs/yr)				Allwbl Annl Ld, Susp.Sed. (lbs/yr)				Flow
	Mugu	Rev, PCH	Cllg, PCH	Rev + Cllg	MuguSC	Rev	Cllg	Rev+Cllg	(MGY)
2001	2.6	0.5	3.5	3.9	0.5	0.1	0.7	0.8	6639
2003	18.2	3.8	**13.1**	17.0	3.7	0.8	2.7	3.5	7322
1998	1.7	0.4	3.4	3.8	0.3	0.1	0.7	0.8	9342
1993	6.4	1.9	6.0	7.9	1.3	0.4	1.2	1.6	11119
1999	16.7	**6.8**	12.7	19.5	3.4	1.4	2.6	4.0	13331
1995	9.7	2.2	8.7	11.0	2.0	0.5	1.8	2.2	13667
2002	56.4	**15.9**	37.3	53.2	11.6	3.3	7.7	10.9	17535
1996	28.2	9.4	14.4	23.9	5.8	1.9	3.0	4.9	18190
2000	59.3	15.4	**42.0**	57.4	12.2	3.2	8.6	11.8	24279
1994	123.8	31.2	115.6	146.8	25.4	6.4	23.7	30.1	45874
1997	183.7	**40.8**	**258.2**	299.1	37.7	8.4	53.0	61.3	69120

Other NPDES dischargers are not considered significant sources of mercury to the watershed and there is insufficient information to assign loads to these sources. Therefore, concentration-based allocations are assigned. Dischargers are allocated loads based on the CTR water column target for protection of human health from consumption of organisms (only).

Table 87. Total Mercury Waste Load Allocations with CTR as Targets for Other NPDES Dischargers in the CCW.

Reach	Mercury Final Daily WLA 30 day Avg (ug/L)
1	0.051
2	0.051
3	0.051
4	0.051
5	0.051
6	0.051
7	0.051
8	0.051
9	0.051
10	0.051
11	0.051
12	0.051
13	0.051

10.5 Impacts of Loading from Ambient Sources - Mercury

As discussed in the Source Analysis section, ambient sources (primarily natural soil concentrations and atmospheric deposition) represent the major contribution to loading of mercury in the CCW. Source and linkage analyses indicate mercury allocations, and thus targets, may not be attainable without reducing background loads and/or other ambient sources. Special studies included in the implementation plan will determine the potential for standards actions or other regulatory actions such as natural background exclusion or site specific objectives. Specifics relating to background loading of mercury follow:

- The background load associated with open space ambient sources represents about half of the total mercury loading in the CCW;
- Ambient sources are a component of urban and agricultural runoff (although human activity can affect the mobilization of mercury from those sources);
- Necessary reductions in the background load may not be attainable, and limiting ambient source contributions to urban and agricultural discharges may prove challenging and costly;
- An overall reduction in mercury loading of 80% which is predicted necessary for attainment of numeric target conditions cannot be accomplished by reducing anthropogenic sources alone.

Implementation measures put in place for other CCW TMDLs (OCs, Toxicity, and Siltation), in combination with implementation measures for this TMDL, will likely result in some reduction of background mercury loading. As implementation measures are put in place, compliance monitoring, special studies, and adaptive management will determine their overall effectiveness.

11 Margin of Safety

A margin of safety for the TMDL is designed to address any uncertainties in the analysis that could result in targets not being achieved in the waterbodies. To identify whether an explicit margin of safety is necessary for each constituent, a summary of the significant uncertainties in the TMDL analysis was developed and compared to the conservative assumptions used to address the uncertainty in the analysis. A summary of the significant uncertainties in the TMDL analysis is included below. In cases where the impact that the assumptions made in the TMDL analysis is known, a discussion of that impact is also included. Then, the implicit margin of safety is discussed.

For both uncertainties and the implicit margin of safety, the first section discusses the uncertainties that are applicable to all of the constituents and then constituent specific uncertainties are discussed.

11.1 Uncertainties in the TMDL Analysis applicable to all Constituents

Flow categories were used to determine loads and there is uncertainty as to whether or not allocations based on those categories will result in achievement of targets in the stream. The assumptions used to develop those categories and allocations from those categories will likely be conservative in some situations and not conservative in other situations.

A model is used to develop the load allocations. A model is not a perfect reflection of environmental conditions and there are uncertainties associated with the quantification of current loads by the model and the determination of whether or not allocations will result in compliance with the targets based on the model results. The model results show that on average the model overpredicts receiving water concentrations and loads for all constituents except nickel. The following table shows a summary of the average difference between the model results and environmental data results. The table summarizes the overall difference and the wet and dry differences.

Table 88. Relative Percent Difference (RPD) between Model Results and Environmental Sampling Data

Constituent	Overall Average RPD	Wet RPD	Dry RPD
Total Copper	32.68	104.14	2.06
Dissolved Copper	31.49	31.88	31.30
Total Nickel	-2.03	61.12	-29.96
Dissolved Nickel	-26.98	-24.56	-28.29
Total Mercury	81.53	105.68	65.28
Total Selenium	24.01	98.60	-10.53

As shown in the table above, wet weather results tend to have a higher difference than dry weather results. In reviewing these results, it should be noted that limited environmental data were available for comparison to model results. Data for high flow conditions are especially limited, which may explain why the model seems to overpredict loading more during high flow conditions. The model predicts conditions during large storm events, but very few actual data representing the largest historical storm events are available for comparison. Thus, model predictions from the largest storm events are necessarily compared to actual data from the largest storm events.

Another uncertainty arises from the fact that HSPF model does not include Mugu Lagoon. A simplified bathtub model was developed for the Lagoon, but there is high uncertainties associated with that model. Finally, tidal influences are not considered in any of the models. Therefore, the loads for the TMDL are calculated based on the sum of the loads into the lagoon, rather than loads in the lagoon itself, to protect the lagoon. This likely results in lower allowable loads than would be required otherwise to protect the lagoon because dilution in the Lagoon is not considered and is therefore a conservative approach to addressing this uncertainty.

Finally, there is uncertainty as to the impacts of the loads on sediment toxicity in Mugu Lagoon.

11.2 Uncertainties in the TMDL Analysis Specific to Copper and Nickel

For copper and nickel, the major uncertainty is associated with the translation between dissolved allowable loads and total allocations. Conservative assumptions were made in the TMDL analysis that resulted in translators that are equivalent to or lower than the translators observed in the environmental data. The following table summarizes the comparison between the chosen translators and the translators calculated from available environmental data.

Table 89. Comparison of TMDL Translators to Environmental Sampling Data Translators

	Constituent	Critical Condition Translator	Maximum Translator From Environmental Data	Minimum Translator from Environmental Data	Median Translator from Environmental Data
Calleguas	**Low Flow**				
	Copper	0.83	N/A	N/A	N/A
	Nickel	0.8	N/A	N/A	N/A
	Average Flow				
	Copper	0.86	1	0.22	0.86
	Nickel	0.85	1	0.31	0.86
	Elevated Dry Flow				
	Copper	0.63	0.51		
	Nickel	0.7	0.57	0.57	0.57
	Wet Flow				
	Copper	0.08	0.13	0.02	0.03
	Nickel	0.14	0.01	0.22	0.07
Revolon	**Low Flow**				
	Copper	0.96	0.98	0.3	0.86
	Nickel	0.97	1	0.8	0.93
	Average Flow				
	Copper	0.85	1	0.15	0.58
	Nickel	0.87	N/A	N/A	N/A
	Elevated Dry Flow				
	Copper	0.57	0.5	0.35	0.43
	Nickel	0.63	0.42	0.42	0.42
	Wet Flow				
	Copper	0.2	0.97	0.03	0.12
	Nickel	0.24	1	0.03	0.19

As shown in the table, the chosen translators are greater than or equal to the median environmental data translators for each category. However, in some cases, the chosen translators are lower than the maximum environmental data translator for the category.

For copper and nickel, the uncertainties related to flow characterization and the translator represent the most significant uncertainties because they are used to calculate the allowable loads. Uncertainties related to the source loads impact how the allocations are divided between sources and how much reduction each source is required to implement. However, the sum of all the sources must still meet the allowable load to achieve the targets. Therefore, the uncertainties related to the calculation of the allowable load are more significant than other uncertainties for copper and nickel.

11.3 Uncertainties in the TMDL Analysis Specific to Mercury and Selenium

For both mercury and selenium, data are insufficient to fully assess whether or not the wildlife targets are being achieved. Therefore, there is some uncertainty as to whether or not the allocations will result in compliance with the wildlife targets.

In addition, the allocation process for mercury has a number of assumptions that result in uncertainties as follows:

- Assumption of that a given percent reduction in suspended sediment loads will result in an approximately equal percent reduction in water column and fish tissue mercury concentrations.
- The model is used to estimate current loads from which the percent reductions are taken to determine allowable loads. The model appears to overestimate loading much of the time.

11.4 Selection of Margin of Safety

To address uncertainty, a TMDL includes a margin of safety, which can be explicit, implicit, or both. An implicit and explicit margin of safety is included for the copper and nickel TMDLs and an implicit margin of safety is included for the selenium and mercury TMDL. Implicit MOS factors common to all constituents are summarized below and factors specific to each constituent and the final MOS for each constituent follow.

MOS Issues Common to All Constituents

- The TMDL includes multiple targets for each constituent to ensure protection from impairment for all possible beneficial uses; each target employs conservative assumptions; and the most protective target will ultimately drive compliance.
- A background load is assigned to the TMDL and assumed to remain constant throughout implementation of the TMDL. This results in higher required reductions for the other sources than would be required if lower background loads were assumed or the background loads decreased over time through implementation.
- Calculation of allocations is based on never exceeding numeric target concentrations rather than the once in three year exceedance allowed by the CTR criteria.
- Calculations of current loads and loading capacity for Mugu Lagoon are based on the combined discharges from Calleguas Creek and Revolon Slough, which overpredicts actual concentrations in the lagoon (since dilution provided by tidal flushing are not accounted for);

Copper-Specific MOS Issues

- The model tends to overestimate total loads of copper on average. This results in a higher current total load and the prediction of a higher percent reduction in the total load than would be required on average to achieve the allowable load.
- For copper, the chosen K_D approach is conservative under almost all conditions and is especially conservative during dry weather conditions. Therefore, out of the total amount of copper in the stream, the model predicts more of it is in dissolved form than demonstrated by the data. Therefore, the total allocations calculated using this K_D are smaller than would be anticipated by looking at the environmental data and are consequently conservative (see translator uncertainty discussion above).

Nickel-Specific MOS Issues

- For nickel, the chosen Kp approach is conservative under almost all conditions and is especially conservative during dry weather conditions. Therefore, out of the total amount of nickel in the stream, the model predicts more of it is in dissolved form than demonstrated by the data. Therefore, the total allocations calculated using this K_D are smaller than would be anticipated by looking at the environmental data and are consequently conservative (see translator uncertainty discussion above).

Selenium-Specific MOS Issues

- The model tends to overestimate total loads of selenium on average. This results in a higher current total load and the prediction of a higher percent reduction in the total load than would be required on average to achieve the allowable load.

Mercury-Specific MOS Issues

- Comparison of total mercury concentrations against methylmercury targets for tissue and bird eggs (in development of this TMDL and in general practice) provides an implicit MOS because not all of the mercury contained in fish tissue and bird eggs is actually methylmercury;
- Maximum 30-day average mercury water concentrations (used to develop required percent reductions) were based on the highest concentration out of five sites located in the lowest portion of the watershed (Mugu Lagoon, Revolon at PCH, Calleguas at PCH, Revolon at Wood Rd, and Calleguas at Potrero).

Rationale for 15% Explicit MOS for Copper and Nickel

Although there is a sizeable implicit margin of safety for copper and nickel, as discussed above, two uncertainties were evaluated in more depth and considered to be significant enough to warrant an explicit margin of safety for these constituents.

- The calculation of the allowable load is based on the median flow rate for each flow category.
- The translation between dissolved allowable loads and total allowable loads is calculated using the median translator for each flow category.

To examine these concerns together, the allowable loads calculated using the median flow rate and median translator were compared to the variable allowable load calculated using the model flow rate and model translator and compared to the allowable load generated using the environmental data flow and translator. The comparison showed that for the low flow and average flow category, the chosen approach was fairly conservative, but it was less conservative for the elevated flow category. A 15% margin of safety was determined to be sufficient to address the elevated flow category, but still account for the more conservative nature of the low and average flow category. This assessment was made by looking at the percentage of time that the flows were in the elevated flow category as compared to the other flow categories.

Rationale for Implicit MOS for Selenium and Mercury

The two major uncertainties described above for copper and nickel are not relevant for selenium or mercury. Thus, selenium and mercury share the implicit MOS factors common to all constituents evaluated in this TMDL and are not associated with the most significant uncertainties. Plus, the development of allocations for selenium and mercury incorporates other individual implicit MOS factors.