California Regional Water Quality Control Board
San Francisco Bay Region

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Arnold Schwarzenegger
Governor

TO: Dorothy Rice
Executive Director
State Water Resources Control Board

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Bruce Wolfe
Date: 2008.04.03
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FROM: Bruce H. Wolfe
Executive Officer
San Francisco Bay
Regional Water Quality Control Board

DATE: April 3, 2008

SUBJECT: **NON-SUBSTANTIVE CORRECTIONS TO THE BASIN PLAN AMENDMENT FOR THE WALKER CREEK WATERSHED MERCURY TMDL—BASIN PLAN AMENDMENT AND STAFF REPORT, ADOPTED BY BOARD RESOLUTION R2-2007-0010**

On January 23, 2007, the San Francisco Bay Regional Water Quality Control Board (Water Board) adopted Resolution R2-2007-0010, amending the Water Board's Basin Plan to establish mercury water quality objectives in the Walker Creek watershed, a total maximum daily load (TMDL), and an implementation plan to reduce mercury in the watershed.

On September 21, 2007, I sent a letter listing four non-substantive changes to the Walker Creek Mercury TMDL. Since sending the letter, I have identified two additional non-substantive changes. This letter replaces the September 21, 2007, letter. Thus, all together, I have identified six minor, non-substantive errors in the proposed Basin Plan amendment and Staff Report for this TMDL. One correction is necessary to correct "underline and strikeout" revisions, which, while applicable for revisions adopted by the Water Board in January 2007, are no longer accurate with the State Board's approval of revisions on July 17, 2007 (for the San Francisco Bay Mercury TMDL Basin Plan Amendment). One of the non-substantive corrections consists of a minor clarifying editorial improvement. The remaining four corrections clarify (as stated in the Staff Report) that the newly established water quality objectives are for methylmercury concentrations in fish tissue, rather than total mercury. The total mercury fish tissue numeric targets in the TMDL are correct.

These corrected water quality objectives are consistent with our TMDL analysis and implementation plan, and reflect the latest U.S. EPA and U.S. Fish and Wildlife Service guidance. Inclusion of water quality objectives in *methylmercury* concentrations in fish tissue, and TMDL numeric targets in *total mercury* provides the implicit margin of safety described in the Staff Report, as levels of methylmercury, as a percentage of total mercury in fish tissue, may range as low as 83 percent. For additional information on this, please see the attached memo, sent to Stephen Blum on December 18, 2007.

The six corrections are described below:

Correction no. 1: Introductory text and Basin Plan Amendment Chapter 3

I have corrected the underline/strikeout conventions by removing double underlines from text. The State Board approved the text previously shown with double underline on July 17, 2007.

Correction no. 2: Basin Plan amendment Table 3-4a

I have corrected the objectives to concentrations of methylmercury in fish tissue.

Correction no. 3: Basin Plan amendment Chapter 7 "TMDL Targets" Section

I have made a minor editorial change to language in the first bullet item, moving the term "average wet weight" so it follows directly behind the term "fish".

Corrections nos. 4 & 5: Staff Report section 5, pages 29 & 32

We correctly show the water quality objectives in the Staff Report Table 5.3 (Safe Fish Methylmercury Levels for Wildlife). Specific to water quality objectives, I have corrected text immediately following Table 5.3 on page 32, and on page 29, to correctly state the water quality objectives as levels of methylmercury in fish.

I also corrected text throughout the Staff Report inserting methylmercury in place of mercury. The Staff Report corrections are described in a memo to file (attached).

Correction no. 6: Staff Report section 6:

All four proposed water quality targets are the same as, or more stringent than, the existing or proposed water quality objectives.

I am attaching the Basin Plan amendment pages showing these changes in double underline/strikeout, and a final revised Basin Plan amendment in single underline/strikeout.

If you have any questions regarding this issue, please contact me at (510) 622-2314, or TMDL section leader James D. Ponton at (510) 622-2492, jponton@waterboards.ca.gov.

Thank you for your attention to this matter.

cc: Joanna Jensen, DWQ
Rik Rasmussen, DWQ
Michael Buckman, DWQ
Steven Blum, OCC

Attachments:

1. EO corrections shown in double underline/strikeout
2. Final Revised BPA (in single underline/strikeout)
3. Memo from Dyan Whyte, AEO, to Stephen Blum, OCC
4. Memo from Jill Marshall, staff, to Bruce Wolfe, EO

PROPOSED BASIN PLAN AMENDMENT

Amending Mercury Water Quality Objectives in Walker Creek and Soulajule Reservoir and their Tributaries and Incorporating a Total Maximum Daily Load and Implementation Plan to Reduce Mercury in the Walker Creek watershed

The following revisions indicated in single underline/strikeout are proposed for Chapter 3, Water Quality Objectives.. ~~The text shown with double underline was approved by the Water Board in 2006, and is pending adoption by the State Board.~~

Chapter 3. Water Quality Objectives

OBJECTIVES FOR SPECIFIC CHEMICAL CONSTITUENTS

Surface waters shall not contain concentrations of chemical constituents in amounts that adversely affect any designated beneficial use. Water quality objectives for selected toxic pollutants for surface waters are given in Tables 3-3, 3-3A, 3-3B, and 3-4, and 3-4A.

The Water Board intends to work towards the derivation of site-specific objectives for the Bay-Delta estuarine system. Site-specific objectives to be considered by the Water Board shall be developed in accordance with the provisions of the federal Clean Water Act, the State Water Code, State Water Board water quality control plans, and this Plan. These site-specific objectives will take into consideration factors such as all available scientific information and monitoring data and the latest U.S. EPA guidance, and local environmental conditions and impacts caused by bioaccumulation. The objectives in Tables 3-3 and 3-4 apply throughout the region except as otherwise indicated in the Tables or when site-specific objectives for the pollutant parameter have been adopted. Site-specific objectives for copper and nickel, adopted for South San Francisco Bay south of the Dumbarton Bridge, are listed in Table 3-3A. Objectives for mercury that apply to San Francisco Bay are listed in Table 3-3B. Objectives for mercury that apply to Walker Creek, Soulajule Reservoir and their tributaries are listed in Table 3-4A.

Table 3-4: Freshwater[a] Water Quality Objectives for Toxic Pollutants for Surface Waters (all values in ug/l)

Compound	4-day Average	1-hr Average
Arsenic[b, c, d]	150	340
Cadmium[b, d]	e	e
Chromium III[f]		
Chromium VI[b, c, d, g]	11	16
Copper[b, c, d]	9.0[h]	13[h]
Cyanide[i]		
Lead[b, c, d]	2.5[j]	65[j]
Mercury[k]	0.025	2.4
Nickel[b, c, d]	52[l]	470[l]
Selenium[m]		
Silver[b, c, d]		3.4[n]
Tributyltin[o]		
Zinc[b, c, d]	120[p]	120[p]

Notes:

a. Freshwaters are those in which the salinity is equal to or less than 1 part per thousand 95% of the time, as set forth in Chapter 4 of the Basin Plan. Unless a site-specific objective has been adopted, these objectives shall apply to all freshwaters except for the South Bay south of Dumbarton Bridge, where the California Toxics Rule (CTR) applies. For waters in which the salinity is between 1 and 10 parts per thousand, the applicable objectives are the more stringent of the marine (Table 3-3) and freshwater objectives.

b. Source: 40 CFR Part 131.38 (California Toxics Rule or CTR), May 18, 2000.

c. These objectives for metals are expressed in terms of the dissolved fraction of the metal in the water column.

d. These objectives are expressed as a function of the water-effect ratio (WER), which is a measure of the toxicity of a pollutant in site water divided by the same measure of the toxicity of the same pollutant in laboratory dilution water. The 1-hr. and 4-day objectives = table value X WER. The table values assume a WER equal to one.

e. The objectives for cadmium and other noted metals are expressed by formulas where H = ln (hardness) as CaCO3 in mg/l: The four-day average objective for cadmium is $e^{(0.7852\ H\ -\ 3.490)}$. This is 1.1 µg/l at a hardness of 100 mg/l as CaCO3. The one-hour average objective for cadmium is $e^{(1.128\ H\ -\ 3.828)}$. This is 3.9 µg/l at a hardness of 100 mg/l as CaCO3.

f. Chromium III criteria were promulgated in the National Toxics Rule (NTR). The NTR criteria specifically apply to San Francisco Bay upstream to and including Suisun Bay and Sacramento-San Joaquin Delta. Note: at the time of writing, the values are 180 ug/l (4-day average) and 550 ug/l (1-hr. average). The objectives for chromium III are based on hardness. The values in this footnote assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective for chromium III is $e^{(0.8190H+1.561)}$. The 1-hour average for chromium III is $e^{(0.8190\ H+3.688)}$.

g. This objective may be met as total chromium.

h. The objectives for copper are based on hardness. The table values assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective for copper is $e^{(0.8545H-1.702)}$. The 1-hour average for copper is $e^{(0.9422H-1.700)}$.

i. Cyanide criteria were promulgated in the National Toxics Rule (NTR). The NTR criteria specifically apply to San Francisco Bay upstream to and including Suisun Bay and Sacramento-San Joaquin Delta. Note: at the time of writing, the values are 5.2 ug/l (4-day average) and 22 ug/l (1-hr. average).

j. The objectives for lead are based on hardness. The table values assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective is $e^{(1.273H -4.705)}$. The 1-hour average for lead is $e^{(1.273H-1.460)}$.

k. Source: U.S. EPA Quality Criteria for Water 1986 (EPA 440/5-86-001), which established a mercury criterion of 0.012 ug/l. The Basin Plan set the objective at 0.025 based on considerations of the level of detection attainable at that time. The 4-day average value for mercury does not apply to Walker Creek and Soulajule Reservoir and their tributaries; instead, the water quality objective specified in Table 3-4A applies. The 1-hour average value continues to apply to these waters.

l. The objectives for nickel are based on hardness. The table values assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective is $e^{(0.8460H + 0.0584)}$. The 1-hour average objective is $e^{(0.8460H + 2.255)}$.

m. Selenium criteria were promulgated for all San Francisco Bay/Delta waters in the National Toxics Rule (NTR). The NTR criteria specifically apply to San Francisco Bay upstream to and including Suisun Bay and Sacramento-San Joaquin Delta. Note: at the time of writing, the values are 5.0 ug/l (4-day average) and 20 ug/l (1-hr. average).

n. The objective for silver is based on hardness. The table value assumes a hardness of 100 mg/l CaCO3. At other hardnesses, the objective must be calculated using the following formula where H = ln (hardness): The 1-hour average objective for silver is $e^{(1.72H – 6.52)}$. U.S. EPA has not developed a 4-day criterion.

o. Tributyltin is a compound used as an antifouling ingredient in marine paints and toxic to aquatic life in low concentrations. U.S. EPA has published draft criteria for protection of aquatic life (Federal Register: December 27, 2002, Vol. 67, No. 249, Page 79090-79091). These criteria are cited for advisory purposes. The draft criteria may be revised.

p. The objectives for zinc are based on hardness. The table values assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective for zinc is $e^{(0.8473 H+0.884)}$. The 1-hour average for zinc is $e^{(0.8473 H+ 0.884)}$.

Table 3-4A: Freshwater Water Quality Objectives for Mercury in Walker Creek, Soulajule Reservoir, and all tributary waters

Protection of Aquatic Organisms and Wildlife[a]	0.05 mg methylmercury per kg fish	Average wet weight concentration measured in whole fish 5–15 cm in length
	0.1 mg methylmercury per kg fish	Average wet weight concentration measured in whole fish 15–35 cm in length

Note:

a. The freshwater water quality objectives for the protection of aquatic organisms and wildlife also protect humans who consume fish from the Walker Creek watershed.

The following text is proposed for insertion into Chapter 7, Water Quality Attainment Strategies including Total Maximum Daily Loads (TMDLs). Because this text would be added in its entirety, it is not shown below in underline/strikeout.

Total Maximum Daily Load for Mercury in Walker Creek and Soulajule Reservoir

Walker Creek and Soulajule Reservoir, which is located in the Walker Creek watershed, are impaired by mercury. This TMDL applies to Soulajule Reservoir and the freshwater portions of Walker Creek. The goal of the TMDL is to establish and maintain environmental conditions that will support beneficial uses of these waters established in Chapter 2.

The following sections establish a concentration-based TMDL for mercury in the Walker Creek watershed, and prescribe actions and monitoring necessary to implement and maintain the TMDL. The numeric targets, allocations, and associated implementation plan will ensure that Walker Creek and Soulajule Reservoir attain applicable water quality standards and achieve the TMDL.

The TMDL allocations and implementation plan are designed to control the amount of mercury discharged to Walker Creek and from Soulajule Reservoir, and prescribe and promote actions to minimize the potential for mercury to be present in the toxic and bioavailable form, methylmercury. Effectiveness of implementation actions, monitoring to track progress toward targets, and the scientific understanding pertaining to mercury will be periodically reviewed. The TMDL may be adapted as warranted.

Problem Statement

Walker Creek and Soulajule Reservoir are impaired because mercury adversely affects beneficial uses, including wildlife habitat and all uses supporting aquatic life.

- Mercury concentrations in Walker Creek exceed the mercury freshwater aquatic life acute toxicity objective established to protect aquatic organisms (Table 3.4).
- Terrestrial species that primarily or exclusively eat fish (such as piscivorous birds, the most sensitive wildlife species in the watershed) are at risk from exposure to mercury due to its tendency to bioaccumulate in the food web. Because mercury concentrations in Walker Creek fish are high enough to threaten the health of piscivorous birds, the narrative bioaccumulation objective (see Chapter 3) and numeric aquatic organism and wildlife mercury water quality objective (Table 3-4a) are not being met.
- Soulajule Reservoir is impaired because some fish in the reservoir exceed mercury levels considered safe for human consumption.
- The beneficial use aimed at protecting the health of people who choose to consume Soulajule Reservoir fish (REC1) is impaired and the narrative bioaccumulation water quality objective is not being met.
- In 2004, the California Office of Environmental Health Hazard Assessment issued an interim advisory recommending that people limit consumption of reservoir fish due to elevated mercury levels.

Sources

The following sources have the potential to discharge mercury to surface waters in the Walker Creek watershed:

- **Gambonini Mine site** – An inactive mercury mine and the largest mercury processing facility in the watershed. Mining waste was not properly contained on-site, and consequently the site discharged large quantities of mercury-laden sediments prior to cleanup (initiated in 1998).
- **Soulajule Watershed and Reservoir** – Two abandoned mercury mines are located in this watershed. Soulajule Reservoir discharges into Walker Creek just downstream of the Gambonini Mine drainage.
- **Downstream depositional features** – Mercury-laden sediments in depositional areas (creek beds, banks, and floodplains) downstream of the mercury mines, which discharge mercury to the creek during storms.
- **Background** – Mercury is present at low concentrations throughout the watershed. Background levels account for atmospheric deposition and naturally occurring mercury found in the watershed's soils. The Walker Creek watershed background suspended sediment mercury concentration is 0.2 mg mercury per kg dry sediment.

TMDL Targets

- To protect wildlife and rare and endangered species, the mercury concentration in fish consumed by piscivorous birds shall not exceed 0.05 mg mercury per kg fish, average wet weight ,measured in whole fish 5–15 cm in length, ~~average wet weight~~ nor shall it exceed 0.1 mg mercury per kg fish, average wet weight, measured in whole fish 15-35 cm in length~~, average wet weight~~. The goal of these targets, which are consistent with the bioaccumulation objective in Chapter 3, is to ensure that controllable water quality factors do not cause detrimental mercury concentrations in Walker Creek and Soulajule Reservoir wildlife.
- To protect aquatic organisms, water column mercury concentrations shall not exceed the water quality objective of 2.4 µg/l (one-hour average).
- To protect humans who consume Soulajule Reservoir and Walker Creek fish (assuming future conditions allow for the consumption of Walker Creek fish), water column mercury concentrations shall not exceed the California Toxics Rule (CTR) criterion of 0.050 µg/l (averaged over a 30-day period).

Allocations and Total Maximum Daily Load

The TMDL for Walker Creek is 0.5 mg mercury per kg suspended sediment and the TMDL for Soulajule Reservoir is 0.04 ng dissolved methylmercury per liter water.

Concentration-based load allocations for Walker Creek and Soulajule Reservoir mercury sources are shown in Table 7-x.

Table 7-x TMDL Mercury Wasteload and Load Allocations

Source	Wasteload Allocation	Load Allocation
Gambonini Mine site NPDES Permit no. CAS000001	5 mg mercury per kg suspended sediment	
Soulajule watershed and Reservoir		0.04 ng dissolved methylmercury per liter water 0.5 mg mercury per kg suspended sediment
Downstream depositional features[1]		0.5 mg mercury per kg suspended sediment
Background[2]		0.2 mg mercury per kg suspended sediment

[1] Applies to sediment released from depositional features (creek beds, banks, and floodplains) downstream of the Gambonini Mine and Soulajule Reservoir.

[2] The background allocation applies to all areas in the Walker Creek watershed outside of the influence of the Gambonini Mine site or Soulajule Reservoir.

Implementation Plan

The implementation plan builds upon previous and ongoing successful efforts to reduce mercury loads in Walker Creek and its tributaries. Table 7-y contains the required implementation measures for each source.

It is important to note that the numeric targets and load allocations in the TMDL are not directly enforceable. To demonstrate attainment of applicable allocations, responsible parties must demonstrate compliance with specified implementation measures and any applicable waste discharge requirements (WDRs) or waiver conditions.

Table 7-y Implementation Measures for Walker Creek Mercury TMDL

Source	Action	Implementing Parties	Completion Date
Gambonini Mine Site	Apply for coverage under the State of California's Industrial Stormwater General Permit	Gambonini Mine Site owner(s)	2007
	Submit to the Water Board for approval a Stormwater Pollution Prevention Plan (SWPPP), implementation schedule, and monitoring plan		
Soulajule Reservoir	Submit to the Executive Officer of the Water Board, a monitoring and implementation plan and schedule to 1) characterize fish tissue, water, and suspended sediment mercury concentrations in Soulajule Reservoir and Arroyo Sausal Creek, and 2) develop and implement methylmercury production controls necessary to attain both in-reservoir and downstream TMDL targets	Marin Municipal Water District	2009
Downstream Depositional Features	Applicants seeking coverage under waste discharge requirements (WDRs) or waivers of WDRs to control pathogens, nutrients, or sediments discharges in the Walker Creek watershed shall incorporate management practices that minimize mercury discharges and methylmercury production	All creekside property owners downstream of Gambonini Mine and Soulajule Reservoir	2009
	All projects regulated under Clean Water Act Section 401 shall include provisions to minimize mercury discharges and methylmercury production		
	Comply with conditions of Marin County's Creek Permit Program		
	Update Marin County's *Creek Permit Guidance for Unincorporated Areas of Marin* to include specific guidance for projects in areas that may contain mercury-enriched sediments	County of Marin	2008

Cost Estimate: Agricultural Water Quality Control Program

Because the implementation measures for grazing lands constitute an agricultural water quality control plan, the cost of that program is estimated below, consistent with California Water Code requirements (Section 13141).

We estimate that 100 percent of the downstream depositional areas can be considered grazing lands. Costs estimated for reducing mercury discharges and methylmercury production on grazing lands are $1.5 to 2.5 million over a ten-year period. These costs are associated with reducing sediment discharges and enhancing habitat conditions on Walker Creek and its tributaries. Considering potential benefits to the public in terms of habitat restoration and water quality, we expect that a significant portion of the costs will be paid for with public funds.

Evaluation and Monitoring

Water Board staff will conduct water quality monitoring to evaluate mercury concentrations in Walker Creek and its tributaries as part of the Surface Water Ambient Monitoring Program (SWAMP). Marin Municipal Water District will conduct water quality monitoring to evaluate mercury concentrations in both Soulajule Reservoir and reservoir discharges to Arroyo Sausal Creek. All water quality monitoring (including quality assurance and quality control procedures) will be performed pursuant to the State Water Board's Quality Assurance Management Plan for this program. The main objectives of the monitoring are:

- Assess attainment of TMDL targets and load allocations
- Evaluate spatial and temporal water quality trends
- Refine understanding of mercury loading in downstream depositional areas
- Refine understanding of methylmercury production and bioaccumulation in Soulajule Reservoir
- Collect sufficient data to prioritize implementation efforts and assess the effectiveness of source control actions

Table 7-z presents locations in the Walker Creek watershed for baseline water quality monitoring. These sites will be monitored for suspended particulate, methyl- and total mercury concentrations during the wet and dry seasons. Fish tissue mercury concentrations will be monitored to aid in understanding mercury and the food web. Mercury concentrations in fish of the size typically consumed by wildlife and humans will be monitored in Soulajule Reservoir to assess progress towards attaining the wildlife and human health target. Wet season sampling will focus on characterizing conditions during peak flow events. SWAMP monitoring will be conducted based on availability of funds.
Walker Creek Ranch is considered an "integration" site for the watershed. Water quality data collected at Walker Creek Ranch integrates Salmon Creek background concentrations with loads from the Gambonini Mine Site, Soulajule Reservoir, and some downstream depositional features. Mercury levels in 5–15 cm fish in Walker Creek will be monitored every five years at Walker Creek Ranch to assess progress towards attaining the wildlife target. In addition, the

Water Board, in cooperation with the United States Geological Survey, maintains a continuous data recorder at Walker Creek Ranch that monitors suspended sediment and particulate mercury concentrations in Walker Creek.

Five years after adoption of this TMDL, the Water Board will evaluate monitoring results and assess progress made toward attaining targets and load allocations. Beginning in 2012 and approximately every five years thereafter, the Water Board will evaluate site specific, sub-watershed-specific, and watershed-wide compliance with the trackable implementation measures specified in Table 7-y.

Table 7-z. Baseline Monitoring Sites

Salmon Creek, upstream of the Gambonini Mercury Mine Site
Walker Creek at Walker Creek Ranch
Walker Creek at Highway 1
Chileno Creek downstream of the inactive Chileno Mine
Soulajule Reservoir
Arroyo Sausal Creek downstream of Soulajoule Reservoir

Adaptive Implementation

Approximately every five years, the Water Board will review the Walker Creek Mercury TMDL and evaluate new and relevant information from monitoring, special studies, and the scientific literature. At a minimum, the following questions will be incorporated into the reviews. Additional questions will be developed in collaboration with stakeholders during each review cycle.

- Are Walker Creek and its tributaries progressing toward TMDL targets as expected? If progress is unclear, how should monitoring efforts be modified to detect trends? If there has not been adequate progress, how should the implementation actions or allocations be modified?
- What are the pollutant loads for the various sources? Have these loads changed over time? How do they vary seasonally? How might source control measures be modified to improve load reduction?
- What wetland and creek restoration methods should be used to minimize mercury discharges and methylmercury production while enhancing and restoring habitat values?
- Are wildlife feeding in Soulajule Reservoir at risk? If so, how can the Reservoir be managed to reduce this risk?
- Does additional sediment, water column, or fish tissue total or methylmercury data support our understanding of linkages in the watershed or suggest an alternative allocation strategy?

- Is there new, reliable, and widely accepted scientific information that suggests modifications to targets, allocations, or implementation actions? If so, how should the TMDL be modified?

Reviews will be coordinated through the Water Board's continuing planning program, with stakeholder participation. Any necessary modifications to the targets, allocations, or implementation plan will be incorporated into the Basin Plan via an amendment process. In evaluating necessary modifications, the Water Board will favor actions that reduce sediment and nutrient loads, pollutants for which the Walker Creek is also impaired.

PROPOSED BASIN PLAN AMENDMENT

Amending Mercury Water Quality Objectives in Walker Creek and Soulajule Reservoir and their Tributaries and Incorporating a Total Maximum Daily Load and Implementation Plan to Reduce Mercury in the Walker Creek watershed

The following revisions indicated in single underline/strikeout are proposed for Chapter 3, Water Quality Objectives.

Chapter 3. Water Quality Objectives

OBJECTIVES FOR SPECIFIC CHEMICAL CONSTITUENTS

Surface waters shall not contain concentrations of chemical constituents in amounts that adversely affect any designated beneficial use. Water quality objectives for selected toxic pollutants for surface waters are given in Tables 3-3, 3-3A, 3-3B, and 3-4, and 3-4A.

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Table 3-4: Freshwater[a] Water Quality Objectives for Toxic Pollutants for Surface Waters (all values in ug/l)

Compound	4-day Average	1-hr Average
Arsenic[b, c, d]	150	340
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Copper[b, c, d]	9.0[h]	13[h]
Cyanide[i]		
Lead[b, c, d]	2.5[j]	65[j]
Mercury[k]	0.025	2.4
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Zinc[b, c, d]	120[p]	120[p]

Notes:

a. Freshwaters are those in which the salinity is equal to or less than 1 part per thousand 95% of the time, as set forth in Chapter 4 of the Basin Plan. Unless a site-specific objective has been adopted, these objectives shall apply to all freshwaters except for the South Bay south of Dumbarton Bridge, where the California Toxics Rule (CTR) applies. For waters in which the salinity is between 1 and 10 parts per thousand, the applicable objectives are the more stringent of the marine (Table 3-3) and freshwater objectives.

b. Source: 40 CFR Part 131.38 (California Toxics Rule or CTR), May 18, 2000.

c. These objectives for metals are expressed in terms of the dissolved fraction of the metal in the water column.

d. These objectives are expressed as a function of the water-effect ratio (WER), which is a measure of the toxicity of a pollutant in site water divided by the same measure of the toxicity of the same pollutant in laboratory dilution water. The 1-hr. and 4-day objectives = table value X WER. The table values assume a WER equal to one.

e. The objectives for cadmium and other noted metals are expressed by formulas where H = ln (hardness) as CaCO3 in mg/l: The four-day average objective for cadmium is $e^{(0.7852\ H\ -\ 3.490)}$. This is 1.1 µg/l at a hardness of 100 mg/l as CaCO3. The one-hour average objective for cadmium is $e^{(1.128\ H\ -\ 3.828)}$. This is 3.9 µg/l at a hardness of 100 mg/l as CaCO3.

f. Chromium III criteria were promulgated in the National Toxics Rule (NTR). The NTR criteria specifically apply to San Francisco Bay upstream to and including Suisun Bay and Sacramento-San Joaquin Delta. Note: at the time of writing, the values are 180 ug/l (4-day average) and 550 ug/l (1-hr. average). The objectives for chromium III are based on hardness. The values in this footnote assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective for chromium III is $e^{(0.8190H+1.561)}$. The 1-hour average for chromium III is $e^{(0.8190\ H+3.688)}$.

g. This objective may be met as total chromium.

h. The objectives for copper are based on hardness. The table values assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective for copper is $e^{(0.8545H-1.702)}$. The 1-hour average for copper is $e^{(0.9422H-1.700)}$.

i. Cyanide criteria were promulgated in the National Toxics Rule (NTR). The NTR criteria specifically apply to San Francisco Bay upstream to and including Suisun Bay and Sacramento-San Joaquin Delta. Note: at the time of writing, the values are 5.2 ug/l (4-day average) and 22 ug/l (1-hr. average).

j. The objectives for lead are based on hardness. The table values assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective is $e^{(1.273H -4.705)}$. The 1-hour average for lead is $e^{(1.273H-1.460)}$.

k. Source: U.S. EPA Quality Criteria for Water 1986 (EPA 440/5-86-001), which established a mercury criterion of 0.012 ug/l. The Basin Plan set the objective at 0.025 based on considerations of the level of detection attainable at that time. The 4-day average value for mercury does not apply to Walker Creek and Soulajule Reservoir and their tributaries; instead, the water quality objective specified in Table 3-4A applies. The 1-hour average value continues to apply to these waters.

l. The objectives for nickel are based on hardness. The table values assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective is $e^{(0.8460H + 0.0584)}$. The 1-hour average objective is $e^{(0.8460H + 2.255)}$.

m. Selenium criteria were promulgated for all San Francisco Bay/Delta waters in the National Toxics Rule (NTR). The NTR criteria specifically apply to San Francisco Bay upstream to and including Suisun Bay and Sacramento-San Joaquin Delta. Note: at the time of writing, the values are 5.0 ug/l (4-day average) and 20 ug/l (1-hr. average).

n. The objective for silver is based on hardness. The table value assumes a hardness of 100 mg/l CaCO3. At other hardnesses, the objective must be calculated using the following formula where H = ln (hardness): The 1-hour average objective for silver is $e^{(1.72H – 6.52)}$. U.S. EPA has not developed a 4-day criterion.

o. Tributyltin is a compound used as an antifouling ingredient in marine paints and toxic to aquatic life in low concentrations. U.S. EPA has published draft criteria for protection of aquatic life (Federal Register: December 27, 2002, Vol. 67, No. 249, Page 79090-79091). These criteria are cited for advisory purposes. The draft criteria may be revised.

p. The objectives for zinc are based on hardness. The table values assume a hardness of 100 mg/l CaCO3. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective for zinc is $e^{(0.8473 H+0.884)}$. The 1-hour average for zinc is $e^{(0.8473 H+ 0.884)}$.

Table 3-4A: Freshwater Water Quality Objectives for Mercury in Walker Creek, Soulajule Reservoir, and all tributary waters

Protection of Aquatic Organisms and Wildlife[a]	0.05 mg methylmercury per kg fish	Average wet weight concentration measured in whole fish 5–15 cm in length
	0.1 mg methylmercury per kg fish	Average wet weight concentration measured in whole fish 15–35 cm in length

Note:

a. The freshwater water quality objectives for the protection of aquatic organisms and wildlife also protect humans who consume fish from the Walker Creek watershed.

The following text is proposed for insertion into Chapter 7, Water Quality Attainment Strategies including Total Maximum Daily Loads (TMDLs). Because this text would be added in its entirety, it is not shown below in underline/strikeout.

Total Maximum Daily Load for Mercury in Walker Creek and Soulajule Reservoir

Walker Creek and Soulajule Reservoir, which is located in the Walker Creek watershed, are impaired by mercury. This TMDL applies to Soulajule Reservoir and the freshwater portions of Walker Creek. The goal of the TMDL is to establish and maintain environmental conditions that will support beneficial uses of these waters established in Chapter 2.

The following sections establish a concentration-based TMDL for mercury in the Walker Creek watershed, and prescribe actions and monitoring necessary to implement and maintain the TMDL. The numeric targets, allocations, and associated implementation plan will ensure that Walker Creek and Soulajule Reservoir attain applicable water quality standards and achieve the TMDL.

The TMDL allocations and implementation plan are designed to control the amount of mercury discharged to Walker Creek and from Soulajule Reservoir, and prescribe and promote actions to minimize the potential for mercury to be present in the toxic and bioavailable form, methylmercury. Effectiveness of implementation actions, monitoring to track progress toward targets, and the scientific understanding pertaining to mercury will be periodically reviewed. The TMDL may be adapted as warranted.

Problem Statement

Walker Creek and Soulajule Reservoir are impaired because mercury adversely affects beneficial uses, including wildlife habitat and all uses supporting aquatic life.

- Mercury concentrations in Walker Creek exceed the mercury freshwater aquatic life acute toxicity objective established to protect aquatic organisms (Table 3.4).
- Terrestrial species that primarily or exclusively eat fish (such as piscivorous birds, the most sensitive wildlife species in the watershed) are at risk from exposure to mercury due to its tendency to bioaccumulate in the food web. Because mercury concentrations in Walker Creek fish are high enough to threaten the health of piscivorous birds, the narrative bioaccumulation objective (see Chapter 3) and numeric aquatic organism and wildlife mercury water quality objective (Table 3-4a) are not being met.
- Soulajule Reservoir is impaired because some fish in the reservoir exceed mercury levels considered safe for human consumption.
- The beneficial use aimed at protecting the health of people who choose to consume Soulajule Reservoir fish (REC1) is impaired and the narrative bioaccumulation water quality objective is not being met.
- In 2004, the California Office of Environmental Health Hazard Assessment issued an interim advisory recommending that people limit consumption of reservoir fish due to elevated mercury levels.

Sources

The following sources have the potential to discharge mercury to surface waters in the Walker Creek watershed:

- **Gambonini Mine site** – An inactive mercury mine and the largest mercury processing facility in the watershed. Mining waste was not properly contained on-site, and consequently the site discharged large quantities of mercury-laden sediments prior to cleanup (initiated in 1998).
- **Soulajule Watershed and Reservoir** – Two abandoned mercury mines are located in this watershed. Soulajule Reservoir discharges into Walker Creek just downstream of the Gambonini Mine drainage.
- **Downstream depositional features** – Mercury-laden sediments in depositional areas (creek beds, banks, and floodplains) downstream of the mercury mines, which discharge mercury to the creek during storms.
- **Background** – Mercury is present at low concentrations throughout the watershed. Background levels account for atmospheric deposition and naturally occurring mercury found in the watershed's soils. The Walker Creek watershed background suspended sediment mercury concentration is 0.2 mg mercury per kg dry sediment.

TMDL Targets

- To protect wildlife and rare and endangered species, the mercury concentration in fish consumed by piscivorous birds shall not exceed 0.05 mg mercury per kg fish, average wet weight ,measured in whole fish 5–15 cm in length, nor shall it exceed 0.1 mg mercury per kg fish, average wet weight, measured in whole fish 15-35 cm in length,. The goal of these targets, which are consistent with the bioaccumulation objective in Chapter 3, is to ensure that controllable water quality factors do not cause detrimental mercury concentrations in Walker Creek and Soulajule Reservoir wildlife.
- To protect aquatic organisms, water column mercury concentrations shall not exceed the water quality objective of 2.4 µg/l (one-hour average).
- To protect humans who consume Soulajule Reservoir and Walker Creek fish (assuming future conditions allow for the consumption of Walker Creek fish), water column mercury concentrations shall not exceed the California Toxics Rule (CTR) criterion of 0.050 µg/l (averaged over a 30-day period).

Allocations and Total Maximum Daily Load

The TMDL for Walker Creek is 0.5 mg mercury per kg suspended sediment and the TMDL for Soulajule Reservoir is 0.04 ng dissolved methylmercury per liter water.

Concentration-based load allocations for Walker Creek and Soulajule Reservoir mercury sources are shown in Table 7-x.

Table 7-x TMDL Mercury Wasteload and Load Allocations

Source	Wasteload Allocation	Load Allocation
Gambonini Mine site NPDES Permit no. CAS000001	5 mg mercury per kg suspended sediment	
Soulajule watershed and Reservoir		0.04 ng dissolved methylmercury per liter water 0.5 mg mercury per kg suspended sediment
Downstream depositional features[1]		0.5 mg mercury per kg suspended sediment
Background[2]		0.2 mg mercury per kg suspended sediment

[1] Applies to sediment released from depositional features (creek beds, banks, and floodplains) downstream of the Gambonini Mine and Soulajule Reservoir.

[2] The background allocation applies to all areas in the Walker Creek watershed outside of the influence of the Gambonini Mine site or Soulajule Reservoir.

Implementation Plan

The implementation plan builds upon previous and ongoing successful efforts to reduce mercury loads in Walker Creek and its tributaries. Table 7-y contains the required implementation measures for each source.

It is important to note that the numeric targets and load allocations in the TMDL are not directly enforceable. To demonstrate attainment of applicable allocations, responsible parties must demonstrate compliance with specified implementation measures and any applicable waste discharge requirements (WDRs) or waiver conditions.

Table 7-y Implementation Measures for Walker Creek Mercury TMDL

Source	Action	Implementing Parties	Completion Date
Gambonini Mine Site	Apply for coverage under the State of California's Industrial Stormwater General Permit	Gambonini Mine Site owner(s)	2007
	Submit to the Water Board for approval a Stormwater Pollution Prevention Plan (SWPPP), implementation schedule, and monitoring plan		
Soulajule Reservoir	Submit to the Executive Officer of the Water Board, a monitoring and implementation plan and schedule to 1) characterize fish tissue, water, and suspended sediment mercury concentrations in Soulajule Reservoir and Arroyo Sausal Creek, and 2) develop and implement methylmercury production controls necessary to attain both in-reservoir and downstream TMDL targets	Marin Municipal Water District	2009
Downstream Depositional Features	Applicants seeking coverage under waste discharge requirements (WDRs) or waivers of WDRs to control pathogens, nutrients, or sediments discharges in the Walker Creek watershed shall incorporate management practices that minimize mercury discharges and methylmercury production	All creekside property owners downstream of Gambonini Mine and Soulajule Reservoir	2009
	All projects regulated under Clean Water Act Section 401 shall include provisions to minimize mercury discharges and methylmercury production		
	Comply with conditions of Marin County's Creek Permit Program		
	Update Marin County's *Creek Permit Guidance for Unincorporated Areas of Marin* to include specific guidance for projects in areas that may contain mercury-enriched sediments	County of Marin	2008

Cost Estimate: Agricultural Water Quality Control Program

Because the implementation measures for grazing lands constitute an agricultural water quality control plan, the cost of that program is estimated below, consistent with California Water Code requirements (Section 13141).

We estimate that 100 percent of the downstream depositional areas can be considered grazing lands. Costs estimated for reducing mercury discharges and methylmercury production on grazing lands are $1.5 to 2.5 million over a ten-year period. These costs are associated with reducing sediment discharges and enhancing habitat conditions on Walker Creek and its tributaries. Considering potential benefits to the public in terms of habitat restoration and water quality, we expect that a significant portion of the costs will be paid for with public funds.

Evaluation and Monitoring

Water Board staff will conduct water quality monitoring to evaluate mercury concentrations in Walker Creek and its tributaries as part of the Surface Water Ambient Monitoring Program (SWAMP). Marin Municipal Water District will conduct water quality monitoring to evaluate mercury concentrations in both Soulajule Reservoir and reservoir discharges to Arroyo Sausal Creek. All water quality monitoring (including quality assurance and quality control procedures) will be performed pursuant to the State Water Board's Quality Assurance Management Plan for this program. The main objectives of the monitoring are:

- Assess attainment of TMDL targets and load allocations
- Evaluate spatial and temporal water quality trends
- Refine understanding of mercury loading in downstream depositional areas
- Refine understanding of methylmercury production and bioaccumulation in Soulajule Reservoir
- Collect sufficient data to prioritize implementation efforts and assess the effectiveness of source control actions

Table 7-z presents locations in the Walker Creek watershed for baseline water quality monitoring. These sites will be monitored for suspended particulate, methyl- and total mercury concentrations during the wet and dry seasons. Fish tissue mercury concentrations will be monitored to aid in understanding mercury and the food web. Mercury concentrations in fish of the size typically consumed by wildlife and humans will be monitored in Soulajule Reservoir to assess progress towards attaining the wildlife and human health target. Wet season sampling will focus on characterizing conditions during peak flow events. SWAMP monitoring will be conducted based on availability of funds.
Walker Creek Ranch is considered an "integration" site for the watershed. Water quality data collected at Walker Creek Ranch integrates Salmon Creek background concentrations with loads from the Gambonini Mine Site, Soulajule Reservoir, and some downstream depositional features. Mercury levels in 5–15 cm fish in Walker Creek will be monitored every five years at Walker Creek Ranch to assess progress towards attaining the wildlife target. In addition, the

Water Board, in cooperation with the United States Geological Survey, maintains a continuous data recorder at Walker Creek Ranch that monitors suspended sediment and particulate mercury concentrations in Walker Creek.

Five years after adoption of this TMDL, the Water Board will evaluate monitoring results and assess progress made toward attaining targets and load allocations. Beginning in 2012 and approximately every five years thereafter, the Water Board will evaluate site specific, sub-watershed-specific, and watershed-wide compliance with the trackable implementation measures specified in Table 7-y.

Table 7-z. Baseline Monitoring Sites

Salmon Creek, upstream of the Gambonini Mercury Mine Site
Walker Creek at Walker Creek Ranch
Walker Creek at Highway 1
Chileno Creek downstream of the inactive Chileno Mine
Soulajule Reservoir
Arroyo Sausal Creek downstream of Soulajoule Reservoir

Adaptive Implementation

Approximately every five years, the Water Board will review the Walker Creek Mercury TMDL and evaluate new and relevant information from monitoring, special studies, and the scientific literature. At a minimum, the following questions will be incorporated into the reviews. Additional questions will be developed in collaboration with stakeholders during each review cycle.

- Are Walker Creek and its tributaries progressing toward TMDL targets as expected? If progress is unclear, how should monitoring efforts be modified to detect trends? If there has not been adequate progress, how should the implementation actions or allocations be modified?
- What are the pollutant loads for the various sources? Have these loads changed over time? How do they vary seasonally? How might source control measures be modified to improve load reduction?
- What wetland and creek restoration methods should be used to minimize mercury discharges and methylmercury production while enhancing and restoring habitat values?
- Are wildlife feeding in Soulajule Reservoir at risk? If so, how can the Reservoir be managed to reduce this risk?
- Does additional sediment, water column, or fish tissue total or methylmercury data support our understanding of linkages in the watershed or suggest an alternative allocation strategy?

- Is there new, reliable, and widely accepted scientific information that suggests modifications to targets, allocations, or implementation actions? If so, how should the TMDL be modified?

Reviews will be coordinated through the Water Board's continuing planning program, with stakeholder participation. Any necessary modifications to the targets, allocations, or implementation plan will be incorporated into the Basin Plan via an amendment process. In evaluating necessary modifications, the Water Board will favor actions that reduce sediment and nutrient loads, pollutants for which the Walker Creek is also impaired.

California Regional Water Quality Control Board
San Francisco Bay Region

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Secretary for
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Arnold Schwarzenegger
Governor

TO: Steve Blum
Office of Chief Counsel
State Resources Control Board

Digitally signed by Dyan C. Whyte
Date: 2007.12.18 12:13:46 -08'00'

FROM: Dyan C. Whyte
Assistant Executive Officer
San Francisco Bay
Regional Water Quality Control Board

SUBJECT: NON-SUBSTANTIVE CORRECTIONS TO THE BASIN PLAN AMENDMENT FOR THE WALKER CREEK WATERSHED MERCURY TMDL— PROPOSED BASIN PLAN AMENDMENT AND STAFF REPORT, ADOPTED BY WATER BOARD RESOLUTION R2-2007-0010

In our letter of September 21, 2007, we identified four minor, non-substantive errors in the proposed Basin Plan amendment and Staff Report for the Walker Creek Watershed Mercury TMDL. In general, the corrections clarify our intention that the newly established water quality objectives are for methylmercury concentrations in fish tissue, rather than total mercury. This letter provides additional background material supporting the non-substantive nature of the requested changes.

Our use of "mercury" in place of the more precise term "methylmercury" in the Basin Plan amendment and Staff Report reflects common usage when discussing mercury toxicity to wildlife and humans. The most toxic form of mercury, and the form which readily bioaccumulates and is of concern, is methylmercury. Consequently, both the U.S. EPA water quality criterion for the protection of human health and the U.S. Fish and Wildlife Service's calculation of mercury targets are for methylmercury concentrations in fish. Thus, in using the term mercury we implicitly assumed that the term signifies methylmercury. The administrative record clearly reflects our reliance on the US EPA & USFWS methylmercury numbers, and our mistaken reference to 'mercury' in Section 5 of the Staff Report.

In order to be certain that both of the stakeholders who commented on the proposed Basin Plan amendment share our understanding that the TMDL applies to methylmercury, staff have contacted U.S. EPA and the Marin Municipal Water District (MMWD). Both U.S. EPA (Diane Fleck, Water Division) and MMWD (Paul Helliker, General Manager and Bob Castle, Water Quality Manager) stated to us that they agree that the proposed changes are non-substantive.

The following discussion documents our intent. It includes:

- References to methylmercury in sources on which we relied in developing the TMDL;
- Explication of language we use in our Staff Report; and
- Comments on our correspondence with technical reviewers of the water quality objectives.

DISCUSSIONS IN THE STAFF REPORT AND CITED REFERENCES

As noted in the Staff Report summary of the analyses undertaken in developing the water quality objectives, we relied on technical documents that looked at methylmercury in the food chain. We did not rely on any technical studies of total mercury concentrations in fish, wildlife, or humans. Our use of references in the development of the fish tissue water quality objectives for methylmercury is described below. We based the proposed water quality objectives (0.05 mg methylmercury per kg fish (5-15 cm in length) 0.01 mg methylmercury per kg fish (15-35 cm in length)) on U.S. Fish and Wildlife Service's document: *Derivation of Numeric Wildlife Targets for Methylmercury in the Development of a Total Maximum Daily Load for the Guadalupe River Watershed* (USFWS 2005).

In Staff Report Section 3.2, "Beneficial Uses Impacted by Mercury in the Walker Creek Watershed," we discuss mercury impacts on piscivorous birds based on the work of Weiner et al. (2003). Weiner et al. looked at the impact of methylmercury bioaccumulation and biomagnification to piscivorous birds.

In the same section, we discuss the risk of mercury exposure to humans who consume fish caught in the Soulajule Reservoir. This discussion is based on the work of the Office of Environmental Health and Health Assessment (OEHHA 2004). This reference, a 2004 interim fish advisory, warns the public about the impact of methylmercury on humans and developing fetuses.

In Staff Report Section 3.3, "Overview of Mercury in the Walker Creek Watershed- Mercury in Biota," we discuss U.S EPA's screening values "when monitoring fish for contaminants to help determine which species are of potential concern to human health. For mercury in fish tissue, the OEEHA screening value and the U.S. EPA criterion is 0.3 milligrams mercury per kilogram of fish." In fact, the U.S. EPA criterion is for *methylmercury* (U.S. EPA 2001). Our discussion of mercury in biota was clearly meant to reference methylmercury in biota.

STAFF REPORT REFERENCES INTENDED TO SIGNIFY METHYLMERCURY

In Staff Report Section 5, "Proposed Water Quality Objectives," we describe the technical documents used to develop the proposed freshwater mercury water quality objectives:

> Replacement of the four-day average freshwater mercury objective with these fish tissue objectives reflects current scientific information and the latest U.S. EPA and U.S. Fish and Wildlife Service (USFWS) guidance. In fact, specifying mercury water quality objectives as fish tissue concentrations rather than water column concentrations is becoming common in California. The Central Valley Water Board recently adopted fish tissue mercury objectives concurrently with their mercury TMDLs for Clear Lake and Cache Creek watersheds. Central Valley Water Board staff calculated mercury fish tissue levels needed to protect aquatic organisms and wildlife using a method recommended by USFWS. Details of these objectives are provided on the Central Valley Water Board's website at http://www.waterboards.ca.gov/centralvalley/programs/tmdl/ . We use the same method herein.

As noted above, the U.S. EPA and US FWS guidance is based on methylmercury. The water quality objectives in the Central Valley Water Board's mercury TMDLs are also for methylmercury, not mercury (CVRWQQB 2003, 2007).

We continue this discussion in Section 5.1, "Proposed Aquatic Organisms and Wildlife Objectives." In this section we discuss the methodology USFWS used in developing targets for five piscivorous bird species. In Table 5.3 (p. 32) we summarize the USFWS-determined safe fish methylmercury levels for wildlife in the Walker Creek watershed, and discuss those safe fish methylmercury levels and the values

that will protect multiple species. In fact, we introduce the discussion with the following sentence, "Table 5.3 lists the levels of methylmercury in fish that USFWS determined to be safe for wildlife in the Walker Creek watershed (p. 31). Our proposed fish-tissue-based water quality objectives are based on USFWS' work determining safe methylmercury levels in fish tissue for wildlife [1].

In Section 5.2, "Wildlife Water Quality Objectives and Human Health," we use a *food chain multiplier* (FCM) to calculate safe levels of fish tissue methylmercury for human consumption, based on USFWS guidance (2005). For this calculation, we used the proposed wildlife water quality objective (based on methylmercury). Clearly, implicit in this calculation is that the value is a methylmercury value. We used the calculated FCM value to determine if the proposed wildlife water quality objective will protect humans consuming fish. For our analysis, we relied on the U.S. EPA methylmercury criteria for protection of human health (USEPA 2001).

In Section 11.7, "Proposed Project, Mitigation Measures, and Alternatives," we discuss Alternative 3, "Adopting U.S. EPA's Methylmercury Criterion." Here we write:

> Under this alternative, the fish tissue target would be set equal to the U.S. EPA fish tissue residue criterion of 0.3 mg mercury per kg fish tissue.

Again, we use the term "mercury" in reference to methylmercury.

CORRESPONDENCE BETWEEN WATER BOARD STAFF AND TECHNICAL REVIEWERS

Correspondence between staff and technical reviewers demonstrates our assumption that our discussions of mercury were about methylmercury, and that both parties agreed that this was the case. Below we provide some examples from correspondence in the administrative record.

In commenting on the water quality objectives proposed in the August 2006 Staff Report, USEPA reviewed the proposed water quality standards, and communicated their support for the proposed aquatic life and wildlife fish tissue objectives. The implicit assumption that fish tissue mercury objectives are methylmercury objectives is evidenced in USEPA's discussion of water quality standard issues:

> New Fish Tissue Wildlife Objectives: The Staff Report at section 5, Proposed Water Quality Objectives, proposes two new fish tissue objectives for the protection of aquatic organisms and wildlife: a fish tissue ***methylmercury*** objective of 0.05 *mg/kg* in TL3 fish between 5 and 15 cm, and 0.10 *mg/kg* in TL4 fish between 15 and 35 cm. We support these objectives as protective of aquatic organisms and wildlife in the Walker Creek watershed, based on the list of species at Table 5.3, page 30 of the Staff Report. We suggest you discuss these objectives with the US Fish and Wildlife Service, if you have not done so already (***emphasis*** added). (Administrative Record, pp. 285-288)

In our response to USEPA's comments on scientifically defensible water-quality criteria we state:

[1] In the Draft Staff Report for Peer Review (June 2006), in the same section (5.1) we also state:

> *Water Board staff propose a fish methylmercury water quality objective and TMDL target of 0.05 mg mercury per kg fish tissue in TL3 fish between 5-15 cm long to protect wildlife. We also propose a water quality objective and TMDL target of 0.10 mg mercury per kg fish tissue in TL 3 fish between 15 and 35 cm in length. (Administrative Record, p. 27).*

Comment Aug06-1[WQS-2c]: Regarding scientifically defensible water quality criteria, "The Clean Water Act (CWA) requires states to adopt scientifically defensible numeric criteria consistent with EPA's current CWA 304(a) criteria guidance….See 40 CFR 131.11."

In response to this request, we added the following text to the Staff Report in Section 11.3 to describe how the TMDL satisfies 40 CFR 131.11:

> With respect to the proposed water quality objectives, the federal regulations at 40 C.F.R. § 131.11 require States to adopt water quality criteria that protect the designated beneficial use, are based on sound scientific rationale, and contain sufficient parameters or constituents to protect the designated use. Where multiple use designations exist, the criteria must support the most sensitive uses. For numeric values such as the water quality objectives proposed here, the criterion should be based on Clean Water Act § 304(a) Guidance (or as modified to reflect site-specific conditions) or other scientifically defensible methods.
>
> Section 5 "Proposed Water Quality Objectives" describes the analyses used to develop the proposed water quality objectives. As described in Section 5.1 (Proposed Aquatic Organisms and Wildlife Objectives), USFWS has determined that the proposed water quality objectives will protect the most sensitive species in the watershed, piscivorous birds. As described in Section 5.2 "Wildlife Water Quality Objectives and Human Health" the proposed objectives are more than sufficient to protect human health (which falls under the designated "Recreation 1" use).
>
> We based our aquatic organism and wildlife fish tissue water quality objectives derivation methodology on USFWS's assessment of U.S. EPA's human health criterion (USFWS 2005, USEPA 2001b). We then used the U. S. EPA's Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion" (USEPA 2006) to evaluate whether the proposed water quality objectives are protective of human health. Following U.S. EPA 304(a) guidance, where appropriate, this analysis was based on site-specific factors. The evaluation shows that the proposed water quality objectives will protect beneficial uses in the watershed and the proposed water quality objectives are more protective than U.S. EPA's latest 304(a) criteria guidance for mercury (0.3 mg mercury/kg fish tissue) to protect human health. (Administrative Record pp. 685-686)

In email discussions with Dan Russell, the USFWS author of : *Derivation of Numeric Wildlife Targets for Methylmercury in the Development of a Total Maximum Daily Load for the Guadalupe River Watershed*, staff uses the term mercury when discussing applying targets developed for the Guadalupe River in the Walker Creek watershed (Administrative Record pp. 1032-1035). We use the term when quoting from the USFWS report, which also uses the term mercury when discussing methylmercury in fish tissue.

To summarize, all of our technical reviewers, including U.S.EPA and U.S. FWS accepted the implicit assumption that the discussions on mercury were referring to methylmercury as evidenced by the lack of any request for language clarification from any technical reviewer regarding our use of the term mercury.

I can assure you that the information in the staff report and administrative record fully supports my submission of non-substantive corrections to the Basin Plan Amendment for the Walker Creek Mercury TMDL. Furthermore, these non-substantive changes are supported by the watershed's stakeholders. If you have any questions regarding this issue, please contact me at (510) 622-2441, or TMDL section leader James D. Ponton at (510) 622-2492, jponton@waterboards.ca.gov.

Thank you for your attention to this matter.

cc: Joanna Jensen, DWQ
Rik Rasmussen, DWQ
Michael Buckman, DWQ

California Regional Water Quality Control Board
San Francisco Bay Region

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Arnold Schwarzenegger
Governor

TO: Bruce H. Wolfe
Executive Officer
SAN FRANCISCO BAY
REGIONAL WATER QUALITY CONTROL BOARD

FROM: Jill Marshall
Planning and TMDL Division

DATE: April 3, 2008

SUBJECT: MINOR REVISIONS TO THE WALKER CREEK MERCURY TMDL STAFF REPORT (ADOPTED JANUARY 2007)

While preparing the administrative record for the Walker Creek Mercury TMDL, we, as well as State Board staff, noticed several non-substantive changes that would help clarify both the proposed Basin Plan Amendment and the supporting Staff Report. This memo summarizes minor changes to the language in the January 2007 Staff Report (Total Maximum Daily Load for Mercury in the Walker Creek Watershed, dated November 20, 2007) that will support the proposed changes to the proposed Basin Plan Amendment Language (approved by our Board on January 13, 2007). We will post the modified Staff Report on our website, as well as provide a copy to State Board staff so it can be included in the State Board's Administrative Record.

Summary Of Minor Changes To The Walker Creek Mercury TMDL Staff Report

1. We have clarified that the newly established water quality objectives (as previously stated in the November 20, 2007 Staff Report) are for methylmercury concentrations in fish tissue, rather than total mercury. The total mercury fish tissue numeric targets in the TMDL are correct.
   Pages: 29, 32, 68

2. We have also corrected text throughout the Staff Report inserting methylmercury in place of mercury as appropriate.
   Pages 1, 11, 12, 14,29, 30, 31, 32, 34, 37, 39, 42, 67, 70