

**Central Valley Water Board Staff's Detailed Responses to
Stakeholder Comments Received on the
February 2008 Draft Delta Mercury Control Program
Basin Plan Amendments and Staff Reports and for the
24-25 April 2008 Central Valley Water Board Hearing**

This document contains the complete text of comments and Central Valley Water Board staff's responses to comments received in preparation for the April 2008 hearing. The Board received copies of all of the 2008 comment letters at the April 2008 hearing. In November 2008, the Board received written responses to many of these comments in the document, "*Staff's Initial Responses to the Board and Stakeholder Questions and Comments at the April 2008 Hearing*".¹ Staff's *Initial Response* document contains responses to broad topics and comments from Board Members and stakeholders. Staff also prepared individual responses to each comment in each of the 2008 stakeholder letters, which are presented in this document.

Because these comments reference earlier drafts of the documents that are now before the Board, many are now out of date. However, the 2008 comments are still relevant, because they defined the issues that were considered in the collaborative process that was undertaken after the April 2008 hearing, where staff engaged stakeholders to further refine the Delta methylmercury TMDL and Basin Plan amendments. Staff has made numerous changes to the Basin Plan Amendment and TMDL Staff Reports and the draft Basin Plan amendment language to incorporate the work of the stakeholder process.

Staff reviewed the 2008 comments during the stakeholder process to help ensure that topics previously raised would not be dropped from consideration. Many comments from 2008 were fully addressed by staff before the April 2008 hearing or during the stakeholder process. Some comments from 2008 contain questions and concerns that the stakeholder process was unable to resolve. Many stakeholders have reiterated their continuing concerns in letters submitted in preparation for the April 2010 hearing. Staff has provided responses to the 2010 comment letters in a separate document.

¹ The *Initial Responses to April 2008 Comments* are also available on the Board's website:
http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/stakeholder_meetings/25nov08_hearing_rtc.pdf

**Staff’s Detailed Responses to Stakeholder Comments Received on the
February 2008 Draft Delta Methylmercury Basin Plan Amendment and Staff
Report and for the 24-25 April 2008 Central Valley Water Board Hearing**

Comments submitted in stakeholder letters are included in their entirety in bold text. Staff responses to stakeholder comments are provided in indented text after each comment. Each staff response is numbered (e.g., “R-1”) for ease of identification and cross-referencing.

Table of Contents

1. Aubrey White, University of California, Davis.....	2
2. California Indian Environmental Alliance.....	5
3. California Rice Commission, California Waterfowl Association, Central Valley Clean Water Association, City of Sacramento, City of Vacaville, County of Sacramento, Ducks Unlimited, Northern California Water Association, Sacramento Regional County Sanitation District, The Nature Conservancy, and California Farm Bureau Federation	7
4. Center for Environmental Health	28
5. Central Valley Clean Water Association	31
6. Central Valley Flood Protection Board	62
7. City of Woodland.....	64
8. Clean Water Action, Environmental Justice Coalition for Water, and BayKeeper.....	67
9. County of Yolo.....	77
10. Delta Protection Commission / Delta Methylmercury TMDL Collaborative	81
11. Fraser Shilling, Ph.D., University of California, Davis	89
12. People for Children’s Health & Environmental Justice	95
13. Sacramento County Regional Sanitation District (9 April 2008).....	98
14. Sacramento County Regional Sanitation District (24 April 2008).....	112
15. Sacramento Stormwater Quality Partnership.....	154
16. South Delta Water Agency.....	165
17. Southeast Asian Assistance Center	177
18. U.S. Environmental Protection Agency	179
19. U.S. Fish and Wildlife Service	189
20. Yolo County Flood Control and Water Conservation District	192

1. Aubrey White, University of California, Davis

Letter date: 22 April 2008

From: Aubrey White, Graduate Student in Community and Regional Development at the University of California, Davis, working with angler communities

I would first like to express my appreciation for the work of those who created the Delta Methyl-Mercury TMDL report. The presence of mercury in the Bay/Delta threatens the health of the communities who depend on the wildlife of the region and deserves the attention of this report. It is clear to me that, despite the multitude of problems facing the Delta today, the Central Valley Regional Water Quality Control Board has taken an active effort in understanding the problem of mercury contamination. As a master's student in Community and Regional Development at UC Davis, I work with angler communities along the Delta. For the past eight months I have been working with subsistence anglers both surveying them to learn about consumption habits and working on education efforts. Throughout this time, I have found the TMDL to be an incredibly helpful resource in understanding and explaining the issue at hand.

I do, however, have several comments about the TMDL that I believe would strengthen its impact.

First, I do not believe the document accurately represents the people and communities that depend on Delta fish. Anglers are extremely ethnically and economically diverse and some are economically dependent on locally-caught fish. Some of these subsistence anglers eat highly contaminated fish (often Sturgeon and Striped Bass) as often as ten times per month. While the national standard for fish consumption that the TMDL uses allows for fish consumption at a rate of once a week, many anglers and their families are consuming more often. In not accounting for higher consumption rates, the TMDL in essence excludes this population from any form of protection. The report should, at the very least, recognize that this level of consumption exists and state the goal of including them in all protection efforts.

R-1: Staff recognizes that there are people who eat more than one meal per week of Delta fish. The Delta mercury control program includes an exposure reduction program of activities to be conducted with fish consumers while methylmercury levels in fish are lowered. This program will also be useful to people who have high consumption rates of Delta fish. Regardless of the fish tissue objective adopted by the Regional Board, exposure reduction activities are needed to reduce the risk to people that eat large amounts of highly-contaminated fish.

R-2: The fish tissue objectives that staff recommend are based on eight ounces (one meal) per week of a mix of trophic level 3 (e.g., bluegill, carp, crayfish, and salmon) and trophic level 4 (e.g., sturgeon, bass, and catfish) fish. If people eat mainly Delta fish species with low levels of methylmercury, they can safely eat more than one meal per week. The California Office of Environmental Hazard Assessment (OEHHA), which issues advisories, identified some Delta fish and shellfish that may safely be eaten at three servings per week right now. A goal of the TMDL is to reduce methylmercury levels so that the fish that are now highest in mercury may be safely eaten at least once per week. Staff evaluated multiple consumption scenarios in the Delta mercury TMDL report and provided four consumption rate alternatives for the Board to consider in the Basin Plan Amendment staff report. The most protective alternative provided for the Board to consider would allow people to safely eat 4-5 meals per week of high-mercury fish

(bass and catfish). Note that although the above text speaks generally of “people eating Delta fish”, the proposed fish tissue objectives are based levels necessary to protect sensitive groups (pregnant and nursing women and young children). In its advisories, OEHHA allows non-sensitive groups (women who are not pregnant, nursing, or intending to become pregnant and men) to eat three times as much fish as the sensitive groups.

R-3: Staff agrees that the water quality objectives should be as protective as possible. However, the USEPA requires that staff show that the TMDL has a “reasonable assurance” of being achieved. A recent study of fish mercury levels in the western United States found few water bodies where fish levels are lower than the proposed objective. The study indicates that methylmercury levels in top trophic level fish lower than the recommended objective, such as those that would allow consumption of 4-5 fish meals/week, may not be achievable in the Delta.¹

Second, while the TMDL focuses on the decrease in mercury from current dischargers, it does not focus on the necessary clean-up of abandoned mines throughout the Sierra Nevadas. While I recognize that the Delta is the focus of the TMDL, the report and plan should describe efforts that must be taken to collaborate within the region and water board’s jurisdiction, regardless of the TMDL’s boundary. Environmental problems are not isolated to inside regional or planning boundaries, and clean-up efforts must bridge this seeming divide.

R-4: Multiple stakeholders commented that the Delta mercury control program should address upstream sources. At the April 2008 hearing, staff proposed that the upstream control programs be developed during Phase 1 of implementation of the Delta TMDL and that no methylmercury reductions would be required in the Delta and Yolo Bypass until the Board has adopted tributary TMDL control programs. Board members and stakeholders generally encouraged this approach. Thus, the draft February 2010 Basin Plan amendments contain a time schedule for the Regional Board to develop major upstream TMDLs before 2017. Because most of the inactive mines are upstream of dams, which trap mercury, upstream TMDLs will need to consider ways to control legacy mercury in the streambeds and banks downstream of major dams to measurably reduce Delta fish methylmercury levels.

Third, while the decrease in mercury contamination in the Delta will take years, people will continue to fish along these waters. The TMDL expresses the need for education efforts but does not provide any information as to how impacted communities can or should be involved. Education efforts are less valuable when they come from a state agency than when they come from a community itself. The TMDL should express ways that community organizations can become involved in education efforts to best reach their constituents. Organizations should be involved in the creation of advisory signs and other education materials. Agencies should not expect anglers to cease fishing, and thus should provide information on alternative fish that are healthier to eat. The problem of mercury contamination is incredibly difficult to describe because it is invisible, builds up over years of consumption, and is but one of a massive number of contaminants we may ingest. Involving community members in the process of mercury clean-up, then, is necessary to effectively protect the populations that the TMDL report seems to have in mind.

Thank you for your time.

¹ Peterson, S. A., J. Van Sickle, A. T. Herlihy, and R. M Hughes. 2007. Mercury concentration in fish from streams and rivers throughout the western United States. *Environmental Science and Technology*, 41: 58-65.

R-5: Staff recognizes the need to include community members in all aspects of a human health exposure reduction program. Funded by the Central Valley Water Board, staff of the UC Davis Department of Environmental Science and Policy and the Southeast Asian Assistance Center developed a report, “Community-Based Strategies to Reduce Mercury Exposure in Delta Fishing Communities”, which clearly points out the needs and benefits of including community organizations and fish-consuming residents. The proposed Basin Plan amendments require dischargers to include affected communities in planning, decision making, and implementation of the exposure reduction program.

2. California Indian Environmental Alliance

Letter date: 26 April 2008

From: Sherri Norris, Executive Director, California Indian Environmental Alliance (CIEA)

Thank you for this opportunity to submit comments to you regarding the proposed methylmercury Basin Plan Amendment for the San Joaquin River Delta.

1) Methylmercury focus

The California Indian Environmental Alliance's position is that this TMDL should focus on methylated and elemental mercury. Because mercury takes many forms and changes in the ecosystem we recognize the difficulty in addressing only one of its many forms. We note that this TMDL is focused on methylmercury and the Board is considering rather this should instead be reverted back to elementary mercury only as the focus of this TMDL. Mercury is the way that the toxin enters into this watershed and must be regulated and remediated. In addition, we recognize that methylmercury is the ultimate toxin that becomes bioavailable and through fish consumption enters the human body. Therefore, we urge the board to take a multi-pronged approach and consider all forms of mercury to address this environmental toxin.

R-6: Staff believes that addressing sources of methylmercury as well as inorganic mercury will lower methylmercury levels in fish more quickly than focusing only on inorganic mercury. Staff will continue to support this position through further discussions of the mercury TMDL program with stakeholders.

2) Fish tissue objectives

CIEA, our constituents and many of our colleagues agree that a fish tissue objective based on a human consumption rate of one meal a week is not protective of subsistence fishers in the watershed who consume many times this amount weekly. Our organization has been a part of the Local Stakeholders Advisory Group of the Department of Health Services' Department of Environmental Health Investigations Delta Watershed Fish. This project which has done extensive work evaluating fishing patters in the Delta. California Indian Peoples maintain their physical and spiritual connection the land through fish and fish consumption. Creation stories, cultural cohesion and the continuation of ceremonies require that fish are safely consumed during ceremonies. We therefore urge the Board to reconsider this rate, which disregards the needs of this high risk population.

R-7: Staff recognizes that there are people who eat more than one meal per week of Delta fish. In recommending fish tissue objectives, however, staff also needed to consider whether the objective will be attained. Staff is recommending a water quality objective that is as protective as possible while having a reasonable assurance of being achieved. A recent study of fish mercury levels in the western United States found few water bodies where fish levels are lower than the proposed objective. The study indicates that methylmercury levels in top trophic level fish lower than the recommended objective may not be achievable in the Delta. The Central Valley Water Board will review the Delta methylmercury control program at the end of the Phase 1 methylmercury study period. If research shows that methylmercury controls will be more successful than anticipated, the Board could decide to lower the fish tissue objective. Following discussions with CIEA and others during the stakeholder process, staff added to the February 2010 draft Basin Plan amendments this statement: "The long-term goal of the mercury program is to enable people to safely eat four to five meals per week of Delta fish".

3) Risk Reduction

We urge the State Board’s language on risk reduction be inserted into the document you are considering currently. This language states: that the San Francisco Bay and Central Valley Regional Boards “investigate ways, consistent with their regulatory authority, to address public health impacts of mercury in San Francisco Bay/Delta fish, including activities that reduce actual and potential exposure of and mitigate health impacts to those people and community most likely to be effected by mercury in San Francisco Bay-Delta caught fish, such as subsistence fisher sand their families.”

R-8: The draft Basin Plan Amendment includes language from Resolution 2005-0060 directing that exposure reduction include activities that reduce the actual and potential exposure and mitigate health impacts.

4) Offsets

CIEA also feels that offsets are undesirable and should not be implemented. If they are they must prove that they 1) do not impact any one community specifically as this is often disproportion ally weighted in local areas that include disadvantaged communities of color, 2) they must not include pollution trading schemes as they move pollution to other location and discourage optimum pollution reductions, and 3) dischargers must first demonstrate they have done everything possible to meet permit goals before being allowed to comply through and offset.

The California Indian Environmental Alliance’s mission is to protect and restore California Indian Peoples’ cultural traditions, ancestral territories, means of subsistence, and environmental health. Thank you for assisting us in meeting this goal in the Bay Area and for your consideration of these comments.

R-9: Staff and stakeholders discussed offsets during the stakeholder process. From these discussions came a set of key principles to guide offset projects that staff added to the February 2010 Basin Plan amendments. Among the key principles are: an offset project should only be allowed after a discharger implements reasonable control measures on-site and an offset project should not be allowed if local wildlife or human communities are disproportionately affected by insufficient actions on-site. Significant decisions, such as on-site requirements that must be satisfied before an entity may complete an offset project, the system for valuing and using offset credits, and whether an offset project may be located outside of the entity’s watershed, still must be made in order for the Regional Board to approve an offset project. The draft Basin Plan amendments also required that an offset program and specific projects be subject to public review.

3. California Rice Commission, California Waterfowl Association, Central Valley Clean Water Association, City of Sacramento, City of Vacaville, County of Sacramento, Ducks Unlimited, Northern California Water Association, Sacramento Regional County Sanitation District, The Nature Conservancy, and California Farm Bureau Federation

Letter date: 9 April 2008

*From: Paul Buttner, Manager, Environmental Affairs, California Rice Commission
Greg Yarris, Director of Conservation Policy, California Waterfowl Association
Jacqueline McCall, Chair, Water Committee, Central Valley Clean Water Association
Sherill Hunn, Supervising Engineer, City of Sacramento
Tony Pirondini, Water Quality Supervisor, City of Vacaville
Kerry Schmitz, Senior Civil Engineer, County of Sacramento
Rudolph Rosen, Ph.D., Director of the Western Regional Office, Ducks Unlimited
L. Ryan Broddrick, Executive Director, Northern California Water Association
Mary K. Snyder, District Engineer, Sacramento Regional County Sanitation District
Susan Tatayon, Assistant Director, California Freshwater Initiative,
The Nature Conservancy
Chris Scheuring, Attorney, California Farm Bureau Federation*

The undersigned organizations continue to have serious concerns with the proposed “Basin Plan Amendment to Control Methyl and Total Mercury in the Sacramento-San Joaquin Delta Estuary (Delta.)” Despite the fact that Regional Board Members directed staff to work with our organizations to address the issues we raised at the March 2007 TMDL workshop, there has been very little outreach by Regional Water Board staff, and virtually no substantive effort to resolve those issues. This conclusion is reflected by the fact that the February 2008 version of the Mercury TMDL is very similar to the earlier draft and, if anything, it is even less acceptable.

R-10: There have been numerous changes to the proposed Basin Plan amendment from the version dated June 2006 to the February 2008 version. The changes were documented and included with the April 2008 hearing agenda. Many stakeholders disagree with the approach outlined in the draft Basin Plan amendment, and there are many issues that have not been resolved. In December 2008, the Board initiated a series of stakeholders meetings to develop mutually acceptable solutions to address the mercury impairment. Staff appreciates the participation of all of the signatories in the stakeholder process.

Chief among all of our concerns about this Mercury TMDL is the fact that more than three quarters of all methylmercury loading into the Delta comes from "open water" and "tributary" sources which are not addressed in the proposed TMDL. The source of this methylmercury loading is the sediment underneath these waters. California law clearly establishes that these waters are owned by the People of California and, as such, the State should be held accountable for reducing these loads.

R-11: In the February 2008 draft Basin Plan amendment, staff proposed a phased approach for implementing the Delta mercury control program and addressing “open water” and “tributary” sources. Under this approach, the first phase of the control program would focus on:

- Conducting methylmercury studies;
- Implementing mercury pollution prevention measures;

- Planning and implementing improvements to the Cache Creek Settling Basin; and
- Identifying other high-priority legacy mercury reduction projects.

The proposed Phase 1 would occur over an eight-year period. At the end of Phase 1, the Board would review the study results and reassess the Delta TMDL allocations and compliance schedules. In Phase 2, implementation of methylmercury management practices would begin and legacy mercury reduction projects would continue. Staff is not proposing that focusing only on in-Delta sources will resolve the Delta mercury impairment.

In response to concerns about tributary and open water sources, staff added to requirements for upstream TMDLs and open water sources of methylmercury. The draft February 2010 Basin Plan amendments contain a time schedule for the Regional Board to develop major upstream mercury TMDLs by 2017, before the end of Phase 1. In this way, requirements for tributary sources will be developed in a timely manner, while within-Delta methylmercury sources are conducting methylmercury control studies.

Also in response, staff assigned responsibility for methylmercury from open water within the Delta to agencies with jurisdiction over the water and streambed. To better recognize that methylmercury is partly an environmental legacy of State and federal concern, staff changed the allocation strategy to incorporate the same percent reductions required for open-water habitat in all Delta/Yolo Bypass subareas as are required for other point and nonpoint sources that discharge to those subareas (rather than setting open water allocations equal to existing average annual methylmercury loads, as was done in the February 2008 draft report). In addition, the February 2010 draft Basin Plan amendments now include language that explicitly requires state and federal agencies whose projects affect the transport of mercury and the production and transport of methylmercury through the Yolo Bypass and Delta or manage open water areas in the Yolo Bypass and Delta (including but not limited to the Department of Water Resources, State Lands Commission, Central Valley Flood Protection Board, U.S. Army Corps of Engineers, and U.S. Bureau of Reclamation) to conduct Phase 1 methylmercury control studies and implement methylmercury reductions as necessary to comply with the open-water allocations by 2030.

It is unfair and unreasonable for this TMDL to impose costly studies and potential load reductions on private property owners, local public agencies, and non-profit groups that construct and maintain wetlands and wildlife areas, when the State is effectively given a "free pass" for the large majority of mercury load to the Delta. Many of the parties listed above are simply the unfortunate recipients of mercury that was transported from state lands and through state owned and controlled channels. These parties had no role in creating the mercury deposited on their lands and had no ability to block its deposition. As such, the expense potentially being assigned to the parties for monitoring or control of methylmercury is unreasonable. As just one example, according to the TMDL Staff Report, February 2008, costs are estimated in the millions of dollars for the studies of wetland sources plus annual costs of up to \$270,000 to implement best management practices.

Clearly, it is time to consider allocating substantial mercury load reductions and study requirements to the State of California. This allocation is critical for policy discussion given the restoration objectives being developed by the Bay Delta Conservation Plan and its pivotal role in meeting the objectives of the Governors Executive Order S-17-06 establishing Blue Ribbon Task Force to develop a durable vision for the management of the Delta. Both the Delta Vision and the Bay Delta Conservation Plan are proposing restoration of thousands of acres to tidal influence and dredging to improve

hydrodynamic function. Considering these diverse and necessary objectives, we believe it is critical that the Regional Water Board be fully informed of the water quality and habitat objectives that are desired and have a clear understanding where objectives can be complimentary or in the worst case mutually exclusive.

We believe the Regional Board should consider a modified approach to the Mercury TMDL that has a more realistic chance of achieving the goal of a “fishable” Delta. This modified approach can build on much of what your staff has developed over the past couple of years, and calls for State responsibility to substantially help fund the Phase 1 studies to characterize methylmercury controls in the Delta. The State of California has already accepted this responsibility, in part, through \$30 million of comprehensive scientific mercury research conducted by CalFed. The State’s ongoing responsibility under this TMDL should include a clear synthesis of the results of that research as well as funding to support the methylmercury studies required under Phase 1 and 2 of this TMDL, in proportion to the load contributions (75% from tributaries and open water sources).

R-12: As described above, staff increased State responsibility by assigning requirements for reducing methylmercury loads from open water to agencies with jurisdiction over Delta open water and its underlying sediment. Although some other sources may be passive recipients of inorganic mercury, such as in irrigation water or previously deposited sediment, human activities can increase the amount of methylmercury that is produced and discharged to the Delta. The proposed Basin Plan amendments would require that nonpoint sources such as irrigated agricultural lands and managed wetlands be responsible for addressing only the methylmercury produced as a result of their land use actions.²

R-13: Staff agrees that Regional Board staff and other stakeholders need to be informed about various Delta programs, planning efforts, and potential conflicts. After the April 2008 hearing, staff engaged stakeholders in a stakeholder collaboration process. Staff also increased its interaction with other Delta programs and processes, such as the Bay Delta Conservation Plan effort, dredging, wetland restoration projects (through 401 water quality certification), and flood management (particularly with DWR). Staff will continue to work with other Delta programs and processes during Phase 1 of implementation. Information about potential conflicts between methylmercury control requirements and other land use benefits is critical for the Board to be able to review and potentially revise the methylmercury allocations. The Regional Board does not yet have enough information to make the decision that for a particular methylmercury source, methylmercury controls are infeasible or other public benefits compel a release from methylmercury reduction requirements. Regional Board staff and other Delta interests will need to work together to compile this information. To the February 2010 draft Basin Plan amendments, staff added the following requirements for the Regional Boards’ Delta mercury control program review at the end of Phase 1:

“The Regional Water Board shall assess: (a) the effectiveness, costs, potential environmental effects, and technical and economic feasibility of potential methylmercury control methods; (b) whether implementation of some control methods would have negative impacts on other project or activity benefits; (c) methods that can be employed to minimize or avoid potentially significant negative impacts to project or activity benefits that may result from control methods;

² The California Water Code Section 13050 defines “wastes” in relation to affecting water quality that are able to be regulated by the Regional Water Boards. If human activities (such as growing crops or managing wetlands) generate more of materials that impact water quality than would be generated solely by natural processes, the additional materials are associated with human activities, and are therefore are “wastes” that are able to be regulated by the Regional Water Boards.

(d) implementation plans and schedules proposed by the dischargers; and (e) whether methylmercury allocations can be attained.“

R-14: The signatories request that the State provide a synthesis of the recent CALFED-funded research. Final CALFED reports were published in October 2008 and are available at this website: <http://mercury.mlml.calstate.edu/reports>. The reports include methylmercury loading studies from five different wetlands, which add to the body of information regarding which wetlands produce significant methylmercury loads and which are methylmercury sinks. A summary of staff’s review of the recent CALFED work is provided in the February 2010 TMDL Staff Report Chapter 3.

Background

In June 2006, the Regional Water Board staff issued for public review a draft Basin Plan Amendment that would embody the anticipated Delta Mercury TMDL. In sum, that draft TMDL: (1) acknowledged that very little is known about methylmercury and particularly how to control methylation; (2) established specific methylmercury load allocations for sources of methylmercury to the Delta (similar to Attachment A although numbers were slightly different in 2006); (3) required load allocation recipients to perform characterization and control studies; and (4) established a methylmercury water concentration “goal” of 0.06 ng/L that would go into effect in 2014.

By letter dated November 17, 2006, a stakeholder group consisting of the California Rice Commission, California Waterfowl Association, Central Valley Clean Water Association, City of Sacramento Department of Utilities, City of Vacaville, Ducks Unlimited, Northern California Water Association, Sacramento Regional County Sanitation District, County of Sacramento, and The Nature Conservancy (Stakeholders), submitted to Regional Water Board Executive Officer Pamela Creedon an “alternative approach for the Delta Methylmercury Basin Plan Amendment” (Attachment B). That “alternative approach” called for fundamental changes in the proposed TMDL, embodying a “different, more comprehensive, long-term approach [to] mercury reduction efforts.” The stakeholders noted that the approach proposed in the draft TMDL “would have profound impacts on...environmental and public health, particularly those associated with wetland management and restoration within the Delta.” The stakeholders requested a re-examination of the approach to mercury management to ensure that it would be based on a sound scientific foundation and advocated the use of creative and flexible compliance approaches, including mercury offsets, while methylation control studies are underway.

A second draft of the TMDL and related Basin Plan Amendment was released in February 2007 for public comment, and a public workshop was held before the Regional Water Board on March 16, 2007. At that public workshop, many interested stakeholders voiced their general and specific concerns about the overall process by which the Mercury TMDL was being developed (that is, insufficient collaboration with stakeholders) as well as the focus and approach being taken to address mercury impairment of the Delta.

R-15: Please refer to staff’s “Response to Comments and Questions Raised at the March 2007 Central Valley Water Board Workshop on the Delta Methylmercury TMDL“, which was provided as Attachment 3 to the agenda package for the April 2008 hearing meeting.³ After the April 2008 hearing, staff engaged in a stakeholder process to help resolve stakeholders’ concerns with the Delta methylmercury program.

³http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/cvwb_hearing_apr08/index.shtml

The “alternative approach” proposed in November 2006 was essentially ignored by staff, which was pointed out at the workshop by representatives of the Stakeholders. During the March 2007 Regional Water Board workshop, several Regional Water Board members asked focused questions and raised specific issues related to, for instance, fish tissue standards, the need for methylmercury water concentration limits, potential roadblocks to mercury “offset” projects, and an overall concern that the Phase 1 TMDL would not lead to meaningful actions to control mercury levels in fish tissue.

R-16: Staff seriously considered the “alternative approach”. Key recommendations to increase responsibility of the State in addressing the mercury problem and to improve assurance that study designs will be supported by sound science have been incorporated into the draft Basin Plan amendments. Staff’s reasons for not accepting two other main recommendations of the alternative approach– assign allocations after Phase 1 studies are completed and focus implementation requirements on reducing total mercury – are provided below in the responses to Issues Discussion.

Salient questions asked during the March 2007 workshop include:

“I would like to see real good peer review data when that comes back.....If that science base isn’t there, we have to look for a new direction.” Karl Longley regarding fish tissue and concentration limits -- peer review, p. 174 beginning line 22.

R-17: Since the March 2007 workshop, staff provided additional verbal and written documentation of the scientific bases for the proposed control program to Board members via the April 2008 public hearing presentation, in the written “Staff’s Initial Responses to Comments at the April 2008 Hearing”, and in the February 2008 Basin Plan amendment and TMDL staff reports. Additional opportunities to hear and question the scientific background occurred during stakeholder process meetings that started in December 2008. The Delta methylmercury TMDL has been scientifically reviewed by two independent scientists through the State Water Board’s formal peer review program (as required by the Porter Cologne Act) and by a mercury expert retained by the Delta Protection Commission. A statistician at the University of California (UC), Davis reviewed the calculations of total mercury and suspended sediment loads entering and leaving the Delta. In addition, much of the information used in the Delta methylmercury TMDL, including the conceptual model of methylmercury production and factors affecting it, methylmercury loads in tributaries and the Delta, and the link between methylmercury in water and methylmercury in fish, was subject to detailed scientific review by a panel of mercury experts through the CalFed Program. None of the peer review scientists attended the March 2007 workshop, but numerous stakeholders presented information on various aspects of the peer review comments. A summary of the scientific peer review comments was provided in *Response to Comments and Questions Raised at the March 2007 Central Valley Water Board Workshop on the Delta Methylmercury TMDL*, which was made available to public and Board members before the April 2008 hearing⁴ The entire scientific peer reviewers’ formal comments and staff’s responses to those comments are provided in Appendices E and F of the February 2008 BPA staff report and on the Regional Board’s website.⁵

⁴http://www.waterboards.ca.gov/centralvalley/board_decisions/tentative_orders/0804/delta_mercury/delta_mercury_att_3.pdf

⁵http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/peer_review_comments/delta_hg_tmdl_peer_rvw_rtc.pdf

“Is imposing a mercury concentration limit going to get us to our goals of cleaning up mercury? Aren’t we really just concerned about mercury in fish?” Kate Hart regarding mercury offsets, p. 175, line 6.

R-18: As staff stated during the March 2007 workshop, local and nationwide studies show that the concentration of methylmercury in water is the most important, single factor in determining how much methylmercury is in fish, and that the most direct way to reduce methylmercury in fish is to reduce the concentration of methylmercury in water. Methylmercury concentrations in water are determined by (a) rates of methylation of inorganic mercury in open-water and wetland sediments and (b) how much methylmercury is discharged to the Delta from point and nonpoint sources in the Delta and its upstream watersheds. At the March 2007 workshop in response to Board Member Hart’s question, staff described the need to link methylmercury in fish to methylmercury in the environment. The link is needed in order to have a mathematical way of determining how much sources need to be reduced in order to achieve safe fish mercury levels. This linkage analysis is a core component of the U.S. Environmental Protection Agency (USEPA) requirements for TMDLs.

“I don’t know why we would only be addressing 6% of the mercury in the entire Delta and not the actual tributaries that are contributing to this problem, and I think we’re putting the cart before the horse. And correct me if I am wrong. I hope I am wrong.” Kate Hart regarding Delta contributions to mercury loading, p. 193, beginning line 5.

R-19: Board Member Hart and other Board Members and stakeholders have asked variations of the essential question, “Why develop a control program for the Delta before upstream water bodies?” A detailed response to this question was provided in “Staff’s Initial Responses to Board and Stakeholder Questions and Comments at the April 2008 Board Hearing”.⁶ There are several reasons that staff recommends adopting a Delta TMDL program before the upstream programs:

- Developing a TMDL control program for mercury in the Delta is a high priority because many people regularly eat Delta fish and some Delta communities consume large quantities of Delta fish.
- Determining what reductions need to be made in the tributary inputs to the Delta to achieve safe fish mercury levels in the Delta sets the minimum requirements for upstream watershed control programs.
- Developing and implementing methylmercury control actions in the Delta in conjunction with inorganic mercury control actions in the tributary watersheds will result in more immediate improvements within the Delta. In addition, methylmercury control methods developed during Phase 1 can be applied to upstream sources.
- At the time when the Central Valley Water Board’s TMDL priorities were established, more information was available for the Delta than any of its tributary watersheds except Cache Creek and Clear Lake. The USEPA has instructed States “to use the data that are available” to develop TMDL control programs, and has placed great pressure on States to develop the TMDLs as quickly as possible. During Phase 1 of the proposed Delta control program, staff would collect additional information to

⁶ Available at:
http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/stakeholder_meetings/25nov08_hearing_rtc.pdf

develop the upstream control programs. Using the CALFED data released in October 2008, staff has already begun to develop methylmercury load estimates for point and nonpoint sources in each of the Delta's tributary watersheds. In addition, staff has already begun developing a methylmercury TMDL for one tributary, the American River.

R-20: Implementing a control program for the Delta is a priority because people from multiple ethnicities, communities, and income levels regularly eat Delta fish for need, culture, and enjoyment. A recent University of California, Davis study estimated that 5% of anglers in the Delta had a mercury intake 10 times higher than recommended as safe by the USEPA and USFDA. About 300,000 licensed anglers fish in the Delta each year, along with an unknown number of unlicensed anglers. According to Dr. Fraser Shilling's testimony during the April 2008 meeting, the California Department of Fish and Game estimates that there are up to twice as many unlicensed anglers as licensed anglers. Dr. Shilling said that, if we assume 400,000 anglers fish in the Delta, then about 20,000 anglers have a mercury intake 10 times higher than the recommended safe level. Dr. Shilling's estimate highlights the need to make reductions in Delta fish mercury levels as quickly as possible. Staff recognizes that reducing within-Delta sources alone will not eliminate the health risks to Delta fish consumers. Staff believes that developing controls for within-Delta methylmercury and inorganic mercury sources and engaging consumers in exposure reduction activities while developing upstream mercury TMDLs will most quickly address the problem.

In February 2008, a third draft Basin Plan Amendment and associated staff reports were released. This third draft TMDL shows few substantive changes since the February 2007 draft and still ignores the "alternative approach" ideas advocated by the Stakeholders in November 2006. The February 2008 draft TMDL also fails to substantively address many of the issues and questions raised by Regional Water Board members during the March 2007 public workshop.

R-21: Staff made a sincere attempt to address Board Member and stakeholder concerns in the February 2008 draft BPA and described their efforts in two documents, "Revisions Based on Stakeholder Comments since June 2006" and "Response to Comments and Questions Raised at the March 2007 Central Valley Water Board Workshop on the Delta Methylmercury TMDL", which are provided as Attachments 2 and 3, respectively, to the agenda package for the April 2008 hearing meeting.⁷

In sum, the February 2008 draft TMDL continues to acknowledge that very little is known about most methylmercury sources, how to control them, and how controlling source contributions of methylmercury will affect fish tissue. Despite this significant conclusion about the state of knowledge, the February 2008 draft (1) establishes specific methylmercury load reduction requirements for some of the sources of methylmercury to the Delta (e.g., agriculture, wetlands, municipal and industrial wastewater, urban stormwater and major tributaries); (2) requires specific load allocation recipients to perform characterization and control studies; and (3) establishes a water concentration "goal" of 0.06 ng/L for methylmercury that would go into effect as early as 2016. In addition, the February 2008 draft TMDL asserts that attainment of the methylmercury load allocations will result in attainment of the fish tissue targets. We fail to see how the February 2008 draft supports such a profound conclusion.

⁷http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/cvwb_hearing_apr08/index.shtml

R-22: To clarify, the 0.06 ng/l goal for ambient Delta water has several purposes: it is used to link methylmercury in Delta water to methylmercury in fish; it is used to determine how much methylmercury sources need to be reduced to achieve the proposed fish tissue objective; and it is used to determine which methylmercury sources would be required to conduct methylmercury studies. The USEPA requires that there be a linkage between the fish methylmercury objective and methylmercury sources. Before the February 2008 staff reports were released, staff revised the draft Basin Plan amendment language to include an explanation of how the goal would be used in Phase 1 and how the goal would not be used as an effluent limit in NPDES permits or other waste discharge requirements during Phase 2 unless the Board makes that determination and amends the Basin Plan. However, the new language did not resolve all stakeholders' concerns on this issue. Thus, staff revised the draft February 2010 Basin Plan amendments to address these concerns. Staff removed the references to the 0.06 ng/l ambient goal in the Basin Plan amendments so that Board staff and others do not misinterpret the goal as an effluent or receiving water limit. A description of how the goal was used to develop the Basin Plan allocations and study requirements remains in the staff reports.

R-23: The signatories state that since significant uncertainties about methylmercury still remain, it is unclear how the Delta mercury control program can assign methylmercury load allocations and assert that fish tissue objectives will be met by meeting the allocations. Staff has two responses. First, all methylmercury sources, including tributaries, are assigned methylmercury allocations (Tables A through D of the February 2010 draft Basin Plan amendments). The allocations are calculated to meet the aqueous methylmercury goal and the recommended fish tissue objectives (Chapter 5 in the TMDL Staff Report). Thus, meeting the allocations is expected to result in achievement of the fish tissue objectives. However, the fish tissue objectives will not be met until all of the allocations are *achieved*. Staff acknowledges that in the February 2008 version of the Basin Plan amendments, the assurance that tributary and open water allocations would be met by the 2030 compliance date appeared weak. The February 2010 Basin Plan amendments assign open water allocations to particular agencies with the same compliance schedule as other dischargers and contain a time schedule for the Regional Board to develop upstream TMDLs that will determine how the tributary allocations will be achieved. During the stakeholder process, many stakeholders encouraged staff to make these two additions.

R-24: Second, staff believes that even though methylmercury control studies are needed, sufficient information exists to assign methylmercury load allocations. Existing data show that some wetlands discharge high levels of methylmercury, while others discharge little or are net sinks for methylmercury. Similarly, methylmercury concentrations discharged by wastewater treatment plant vary widely between individual plants. Staff's recommendation for a study period is based on the premise that understanding the differences between individual methylmercury sources will lead to the development of effective methylmercury management practices that can be implemented in Phase 2. Possible methods by which various methylmercury source types may reduce their methylmercury discharges to meet the allocations are discussed in February 2010 Basin Plan Amendment staff report Section 4.3. Staff appreciates the initiative taken by some signatories during the stakeholder process to begin gathering current methylmercury control information and applying for funds to help support studies. Staff agrees with stakeholders that the program should be adaptively managed and that allocations should be changed if studies show compliance is not possible. The draft Basin Plan amendments commit the Regional Board to reviewing the program in a public forum at the end of the Phase 1 studies and revising the Basin Plan as needed.

Issue Discussion

The February 2008 draft TMDL recognizes that, based on the current state of science, very little is known about how to control sources of methylmercury affecting the Delta. Furthermore, it is unknown if controlling only those methylmercury sources identified in this TMDL will actually change ambient water concentrations and ultimately reduce mercury concentrations in fish. However, despite these many unknowns, the draft TMDL asserts that attainment of methylmercury load allocations will result in meeting fish tissue targets. To our knowledge, there is not sufficient information to make the assertion, which is the basis for the load allocations proposed. The purpose behind Phase 1 of the TMDL is to characterize sources and study ways to control methylmercury. Once this information is developed, then appropriate load allocations and controls can be identified. Until that time, the proposed TMDL goals, allocations and required controls currently included in the draft are premature and unsupported by current science.

R-25: The proposed fish tissue objectives are expected to be achieved when all of the methylmercury allocations, including those for tributaries, are achieved. Staff has acknowledged that methylmercury reductions within-Delta sources are expected to measurably reduce fish mercury levels, but would not, alone, achieve the fish tissue objectives. Load and waste load allocations are required elements of a TMDL. Allocations must be set at values that will achieve the water quality objectives. The proposed Basin Plan amendment commits the Regional Board to reviewing and adjusting the allocations after information is gathered in Phase 1. Please see staff's responses above for further discussion of the state of science that supports assigning allocations now.

As Attachment A shows, at best, the draft TMDL may lead to an unknown reduction (not elimination) in only about 25% of all methylmercury loading to the Delta. The remaining 75% of all current sources of methylmercury to the Delta would not be controlled under this TMDL. The implication that future TMDL's in the tributaries and open water sources will effectively achieve the desired reductions for 75% of the methylmercury load is unsubstantiated. Furthermore, the claim is untenable considering the huge challenge of finding any effective and reasonable methylmercury controls. In short, this TMDL ignores 75% of the methylmercury load. This TMDL only proposes to study 25% of the load to determine if they are controllable and if they are, determine if controlling these loads will attain the fish tissue goals. In reality, the ability to achieve the reductions in fish by controlling 25% of the load is unknown.

R-26: The proposed Basin Plan amendment assigns methylmercury allocations to all methylmercury sources, including open water in the Delta and methylmercury from tributaries. In response to concerns by the signatories and other stakeholders, staff assigned responsibility for State and federal water managers to address methylmercury produced in open water and set a time schedule for Regional Board staff to develop upstream TMDLs during Phase 1. Both of these additions strengthen the process for reducing methylmercury from sources upstream of the Delta.

R-27: The signatories state that only within-Delta sources are required to participate in methylmercury control studies. The aerial scope of the studies is actually broader for State and federal agencies that control water and sediment management. The proposed Basin Plan amendments require that these agencies evaluate methylmercury control measures for any projects that affect methylmercury and/or mercury in the Delta (e.g., a new, upstream water storage facility that could increase the methylmercury load entering the Delta).

R-28: At an early point in development of the Delta mercury control program, staff proposed that all methylmercury dischargers within a 30-mile radius of the legal Delta boundary participate in the Phase 1 studies. This would have increased the amount of methylmercury control information produced. Although staff has not completed detailed methylmercury source analyses for Delta tributaries, source types and control options are expected to be similar upstream and within the Delta. However, stakeholders at that time commented that allocations and associated study requirements should apply only to sources within and entering the TMDL⁸. Instead of requiring that upstream dischargers (except water management agencies) participate in studies, the February 2010 Basin Plan amendments provide for voluntary, early participation in studies. Dischargers who participate in the Delta Phase 1 control studies would be exempt from conducting equivalent control studies under future, upstream control programs.

Further, the notion of manipulating wetlands for the purpose of controlling ambient water concentrations of methylmercury in the Delta could thwart other ongoing and proposed efforts to restore essential Delta ecosystem function. One should recognize that loss of critical habitat is one of the likely consequences that could result from a narrowly focused control strategy, such as limiting natural methylation pathways in Delta wetlands in the effort to control methylmercury production. For example, recent work by the Governor's Delta Vision Blue Ribbon Task Force identified "[h]igh priority ecosystem revitalization projects should be pursued aggressively...." These projects would involve considerable wetlands restoration, and as such the Assembly is now considering legislation (AB 2502) to create a wetlands restoration fund to restore tidal wetlands on three Delta islands. The current focus of Phase 1 of this TMDL on methylmercury allocations is premature, fatally flawed and cannot reasonably be expected to result in the anticipated reductions in fish tissue concentrations cited by Regional Water Board staff.

R-29: The Central Valley Water Board will adaptively manage the Delta mercury control program. The proposed Basin Plan amendment commits the Regional Board to reviewing feasibility and potential impact of methylmercury controls before methylmercury control actions are required. The Regional Board does not yet have enough information to make the decision that for a particular methylmercury source, methylmercury controls are infeasible or other public benefits compel an exemption from methylmercury reduction requirements. Given the amount of wetland restoration planned in the Delta and Yolo Bypass, it may be difficult, if not impossible, to achieve safe fish mercury levels for wildlife in all areas of the Yolo Bypass and Delta if the control program does not address methylmercury production by wetlands.

R-30: During Phase 1, staff would like to work with the signatories and other Delta planning efforts, such as the Bay Delta Conservation Plan, to determine potential negative consequences of specific methylmercury requirements on particular projects and processes. Neither the Regional Board nor Delta ecosystem planning efforts has yet developed such detailed information. The 2000 California Bay Delta Program Record of Decision found that ecosystem restoration efforts in the Delta and Yolo Bypass have the potential to increase exposure of people and wildlife to methylmercury and that methylmercury mitigation should be developed for wetlands prior to their construction. Wetlands intended for recovery of threatened and endangered species under the federal Endangered Species Act may have such particular parameters for construction and management that methylmercury control in these wetlands is not possible without adversely affecting the wetland intent. However, staff expects that there

⁸ *Basin Plan Amendment Revisions Based on Stakeholder Comments Since June 2006.*
http://www.waterboards.ca.gov/centralvalley/board_decisions/tentative_orders/0804/delta_mercury/delta_mercury_att_2.pdf

are other wetlands intended for general habitat (i.e., not to satisfy Endangered Species Act requirements) that can be created and managed to reduce methylmercury without unacceptably decreasing desired wetland functions. It is important to remember that the Delta methylmercury TMDL satisfies the federal Clean Water Act requirement for a program that eliminates the water quality impairment.

R-31: The CalFed Record of Decision's recognition of the potential for wetlands restoration to increase methylmercury underlies staff's recommendation that methylmercury studies be conducted for all types of wetlands. The CalFed Record of Decision and Ecosystem Restoration Program Plan indicated that the potential for wetlands restoration to increase methylmercury is an important concern and that such increases should be mitigated. Staff recognizes, though, that other agencies and entities are proceeding with plans for recovery of endangered species and restoration of habitat. There is time during Phase 1 to identify habitat types or locations that are critical to species recovery efforts and to exempt them, if necessary, from on-site methylmercury controls. Even in critical habitat areas, the basic methylmercury characterization studies should be conducted to see if there are any feasible and reasonable practices that could be implemented so that other species in the wetland or downstream are not harmed by methylmercury produced by the critical habitat area.

R-32: Phase 1 studies may show that methylmercury production in some wetlands cannot be controlled without impacting habitat function. At the end of Phase 1, then, the Board may find that the benefits of particular wetlands or wetland types outweigh the detrimental effects of methylmercury management and determine that those wetlands are exempt from implementing methylmercury control projects. Alternatively, the Board may find that reductions in methylmercury from wetlands are feasible and should be required. Regardless, without the Phase 1 studies, this will be a very difficult decision for the Board to make.

A Modified Approach

Key elements of a modified approach proposed by the undersigned stakeholders include:

1. The State must establish the means to fund the methylmercury characterization and control studies required during Phase 1 of the February 2008 draft TMDL. This important work will appropriately inform the Regional Water Board whether and when it is appropriate to establish methylmercury load allocations. It is unacceptable that this TMDL assigns no responsibility to the State of California to address 75% of the methylmercury load which comes from open water and tributary sources. Gold mining legacy sources of mercury are spread throughout much of the waters of the State. The modified approach proposed by the stakeholders offers a fair approach by the State of California to fund characterization and control studies, in proportion to its methylmercury load contribution to the Delta.

R-33: In response to stakeholders' requests for greater State involvement, the Basin Plan amendments assign greater responsibility to the State, including a portion of the methylmercury studies. Staff proposed at the April 2008 hearing to assign a methylmercury allocation to the State and responsibility for a portion of the methylmercury studies. After additional discussion in the stakeholder process, the February 2010 Basin Plan amendments include language that explicitly requires State and federal agencies whose projects affect mercury and methylmercury transport or manage open water areas in the Yolo Bypass and Delta to conduct Phase 1 methylmercury control studies and implement methylmercury reductions as necessary to comply with the open-water allocations by 2030. Staff believes that these requirements represent a fair, proportional contribution to by the State. Note that

although open water and tributaries contribute much of the Delta's methylmercury loads, inorganic mercury in the open water and tributaries comes from contemporary (e.g., atmospheric deposition, urban runoff, and erosion of naturally-enriched soil) as well as the Gold Rush legacy.

In addition to specific requirements assigned to the State, staff expects that the State and federal governments will continue to provide resources for studies. CALFED Science Program staff has expressed a willingness to help develop a scientific advisory panel and coordinate studies.⁹ Board staff has worked and will continue to work with stakeholders to obtain grant, loan, and other funding for methylmercury studies and reduction projects. The focus of priority funding is addressing 303(d)-listed impaired waters, and the Delta has been identified as a high priority impaired water body. Currently USEPA is directing 319(h) grant funding towards implementation of TMDLs where non-point source pollution adds to the impairment. Ultimately, though, responsible parties in the Delta and its tributary watersheds would be accountable for developing control strategies to reduce their contribution to the methylmercury impairment. Staff acknowledges that a portion of resources earmarked for wetland restoration, water management, and other beneficial projects may need to be used to address methylmercury issues. There are other situations in which Water Boards have required dischargers, including those with public benefit mandates, to conduct control studies as part of a TMDL implementation program (see "Staff's Initial Response to Board and Stakeholder Questions and Comments at the April 2008 Hearing", page 11¹⁰).

R-34: The signatories propose that allocations be developed after Phase 1. A main difference between the signatories' Modified Approach and the proposed Basin Plan amendment is when methylmercury allocations are developed. Staff has sufficient information now to develop individual methylmercury allocations for point sources and subarea-based allocations for nonpoint sources. The February 2010 draft BPA and TMDL staff reports provide a detailed justification of the allocation approach. Allocations are a required element of TMDL programs. The adaptive strategy proposed in the Basin Plan amendments commits the Regional Board to review and adjust the allocations based on new information at the end of Phase 1, before dischargers would be required to start progress toward achieving the allocations.

Central to this modified approach is the expectation that the characterization and control studies are not only predicated on a strong scientific foundation, but that the results of these studies and holistic analysis of the effectiveness of future methylmercury controls on reducing fish tissue concentrations in the Delta should be subject to independent scientific peer review. This modified approach will provide the Regional Water Board and all stakeholders with a better understanding of what can be done, by whom, when, and at what cost.

R-35: Staff agrees that the studies should be scientifically sound and provide the basis for adaptive management. The proposed Basin Plan amendments require that the Regional Board form a Technical Advisory Committee (TAC) of independent, scientific experts to advise the Board on scientific and technical issues, provide recommendations on methylmercury study

⁹ Lauren Hastings, CalFed Science Program, during public discussion at the December 19th stakeholder meeting facilitated by the CCP.

¹⁰ http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/stakeholder_meetings/25nov08_hearing_rtc.pdf

design, and review study results. This independent committee would help inform the Board at the end of Phase 1. The Board shall form and manage the TAC with recommendations from dischargers and other stakeholders.

2. Establish an appropriate fish tissue standard to protect beneficial uses now and into the future. We support the fish tissue standard proposed by Regional Water Board staff in the February 2008 draft Mercury TMDL.

R-36: No response needed.

3. Recognize the current limitations on the ability to control methylmercury from various identified sources. The characterization and control studies performed in Phase 1 of the Mercury TMDL are intended to provide the Regional Board and all stakeholders with better, more current information about the controllability of methylmercury from the identified sources. The level of effort and resources required for characterization and control studies should be linked to the relative magnitude of the source. In addition, the TMDL should include flexibility for dischargers to combine resources for these studies on a regional and watershed basis. This would facilitate a stronger focus on the most important sources and areas of interest, rather than forcing expensive studies of relatively insignificant sources.

R-37: Staff agrees that level of effort spent on methylmercury control studies should be associated with the relative magnitude of the source and that combining resources should be encouraged. Staff does not recommend that every individual NPDES, MS4, and agricultural and wetland landowner individually conduct a study. The draft Basin Plan amendments state that control studies can be developed through a stakeholder group approach, other collaborative mechanism, or by individual dischargers. The draft BPA also state that control studies will be governed using an adaptive management approach, which allows for prioritization of source types or other study variables. The independent Technical Advisory Committee will provide recommendations to dischargers and the Regional Board regarding effective study designs.

R-38: Following discussions with stakeholders, staff reduced the proposed Phase 1 study requirements by eliminating the source characterization portion. The emphasis is now on developing control methods and not on basic science, such as mercury cycling. The Basin Plan amendments encourage coordinated studies in order to effectively develop and evaluate management practices for point and nonpoint sources of methylmercury and total mercury.

4. Create early incentives for the removal and control of total mercury from the Delta and upstream watersheds. The state of current science cannot tell us how to control methylmercury loading to the Delta. Reliance on total mercury rather than methylmercury load allocations is consistent with the approach taken in the San Francisco Bay mercury TMDL and other TMDL's nationwide. When the Phase 1 studies are complete, the Regional Water Board will be better informed as to what can be controlled and at what cost. Until then, it is unknown whether the methylmercury allocations can be met or if they are even needed. Therefore, it is most appropriate to focus our current mercury removal and control strategies on mercury sources that we do know how to control, which are ultimately part of the long-term solution. By focusing our removal and control strategies on total mercury while the Phase 1 methylmercury studies are being done, we have the best chance to effect both total and methylmercury reductions in the Delta now and into the future. Again, the State should share proportionally in funding these total mercury offset projects.

R-39: Staff agrees that it is important to create incentives for early removal of mercury from the Delta and its tributary watersheds. The draft Basin Plan amendments provide for an

offset program, under which early implementation could be conducted. Pilot offset projects can occur in Phase 1 while the Regional Board develops a full offset program. Staff and stakeholders discussed offsets during the stakeholder process and developed a set of key principles for Phase 1 offset projects.

The Central Valley and San Francisco Bay Water Boards incorporated similar methylmercury-based science in their TMDL control programs. The Central Valley Water Board adopted a methylmercury TMDL for the Cache Creek and its tributaries. The San Francisco Bay Water Board staff adopted a TMDL for the Guadalupe River watershed that uses a methylmercury fish-water linkage and allocates methylmercury in reservoirs. The Santa Clara Valley Water District's pilot project to reduce methylmercury in Lake Almaden in the Guadalupe Watershed has shown very positive results.¹¹ The San Francisco Bay Water Board's mercury TMDL for San Francisco Bay requires Bay dischargers to address methylmercury. Specifically in San Francisco Bay: a) NPDES dischargers, dredging projects, and wetland projects are required to monitor methylmercury and do methylmercury studies; b) dredging and disposal operations are required to demonstrate that their activities do not increase the bioavailability of mercury; and c) wetland restoration projects are required to be designed and operated to minimize methylmercury production and result in no net increase in mercury or methylmercury loads to San Francisco Bay.

The other main difference between the signatories' Modified Approach and the proposed Basin Plan amendments is whether allocations are in the form of inorganic mercury or methylmercury. Focusing only on total mercury will prolong the mercury impairment in the Delta and may not ever result in reaching the fish tissue objectives. Staff recommends a long-term strategy that would directly address both methylmercury and total mercury sources during Phase 2 because:

- There is adequate science and understanding of methylmercury cycling to have a TMDL based on methylmercury and a phased implementation program based on controlling both methylmercury and total mercury sources.
- A control program that focuses only on inorganic mercury would not reduce fish tissue methylmercury levels as quickly as implementing a program that addresses both inorganic mercury sources and methylmercury sources;
- An inorganic mercury control program likely would not achieve the proposed fish tissue objective in all areas of the Delta; and
- Given that modern point sources and legacy mercury from historic mining activities may comprise only about 35% of inorganic mercury entering the Delta, even if legacy mercury loads and modern point sources could be reduced to zero, we would still need to be concerned about activities in and around the Delta that contribute methylmercury. Please see the detailed rationale for addressing both methylmercury and mercury in "Staff's Initial Response to Comments from the April 2008 Hearing", Item A-1, pages 3 through 12.

Staff agrees that it makes sense to focus implementation activities on inorganic (total) mercury reduction efforts while Phase 1 methylmercury studies are conducted. Phase 1 includes requirements for reducing total mercury from NPDES facilities, urban runoff systems, and within

¹¹ Drury, D. 2007. Santa Clara Valley Water District. Reduction of methyl mercury concentrations in an urban lake using a solar-powered circulator. Presentation at the 2007 Annual International Symposium of the North American Lake Management Society. October. <http://www.nalms.org/Conferences/Orlando/PDF/Orlando2007Program.pdf>

tributaries. In response to stakeholders' uncertainty about the feasibility of all methylmercury sources and source types to meet the proposed allocations, staff strengthened the commitment of the Regional Board to fully review the allocations, including feasibility and potential negative effects, after Phase 1.

5. Eliminate the water concentration “goal” and develop methylmercury allocations at the end of Phase 1 based on outcome of characterization and control studies. The methylmercury water concentration goal is not necessary and is redundant if a fish tissue standard is adopted. Establishing a water concentration “goal” (or target, limit, trigger, or standard) before the Phase 1 studies have been completed is premature. The purpose of Phase 1 is to determine if reducing sources will attain the desired levels in fish. Without this information, the proposed goal and allocations are unsupported by science. In the face of what could be completely “uncontrollable” tributary and open water sources, the question of attainability of the goal and allocations becomes paramount. Further, point source dischargers view the proposed water concentration goal as an eventual permit limit which cannot be met without major treatment plant modifications. This increased treatment comes at a price that includes higher energy demands and greenhouse gas emissions to both construct and operate those facilities. These same point source dischargers are those most likely, able, and willing to perform pilot “offset” projects and other collaborative roles in the future development of the TMDL. The costs of treatment to meet the goal will obviate their interest in implementing offset projects.

R-40: First, staff does not recommend that the 0.06 ng/l ambient goal be used as an effluent or receiving water limit in NPDES permits or other waste discharge requirements. Before the February 2008 staff reports were released, staff revised the draft BPA language to include an explanation of how the goal would be used in Phase 1, and how the goal would not be used as an effluent limit in permits during Phase 2 unless the Board makes that determination and amends the Basin Plan. However, the new language did not resolve all stakeholders' concerns on this issue. As a result, removed all references to the 0.06 ng/l ambient goal from the draft Basin Plan amendments so that Board staff and others do not misinterpret the goal as an effluent or receiving water limit. A description of how the goal was used to develop the Basin Plan allocations and study requirements will remain in the staff reports.

R-41: The aqueous methylmercury goal links methylmercury in fish to methylmercury in the environment. It is calculated using robust datasets of concentrations of methylmercury in water and fish within the different subareas of the Delta and is determined separately from the estimates of methylmercury loads discharged from various sources. The link provides a mathematical way of determining how much methylmercury sources need to be reduced in order to achieve safe fish mercury levels. A linkage analysis is a required component of a TMDL.

R-42: The signatories state that the purpose of Phase 1 studies is to determine if reducing sources will achieve the proposed fish tissue objectives. Actually, the purpose of the Phase 1 studies is to determine which methylmercury and inorganic mercury sources are most feasible to control and potential costs and environmental impacts associated with those controls. The fish tissue objectives are nearly met in the Central Delta (0.26 mg/kg average mercury concentration in Central Delta trophic level 4 fish compared to 0.24 mg/kg trophic level 4 objective). This information strongly supports the contention that the proposed fish tissue objectives are achievable elsewhere in the Delta. The Phase 1 studies will provide information regarding which methylmercury control measures are most effective for particular sources and whether reducing methylmercury to extent called for by allocations is infeasible for any sources. The adaptive strategy in the Basin Plan amendments commits the Regional Board

to reconsidering allocations after the end of Phase 1 and allows the Delta control program and associated goals and allocations to be modified as new scientific and management information becomes available. If some sources are unable to reduce methylmercury, however, the methylmercury allocations for other sources may have to become more stringent. The reliance of the Delta mercury control program on total mercury reductions, possibly through offsets, may also have to be increased, which would increase the time to reach the desired levels of safe fish consumption in the Delta.

R-43: The signatories are concerned that point source dischargers, which likely have the greatest resources available for offsets, will be deterred from early offset projects by the high cost and stringent requirements for meeting facility-specific methylmercury allocations. The Basin Plan amendments contain provisions for mercury offsets for the purposes of providing flexibility in meeting regulatory requirements and promoting watershed-based activities that result in earlier and/or larger load reductions to the Delta. Offsets would be considered on a project-specific basis during Phase 1, while the Regional Board develops a full offset program. Staff worked with the signatories and others during the stakeholder process to refine the Basin Plan amendments language related to offsets. These discussions produced a set of “key principles” to guide offset projects during Phase 1.

Note that one principle states that offsets will not be used to force dischargers to bear more than their “fair share” of responsibility of contributing to a water quality impairment. Point source dischargers may find that offsets are not needed to meet methylmercury allocations. Total mercury minimization measures have the potential to reduce NPDES methylmercury discharges sufficiently for some facilities to achieve staff’s proposed methylmercury allocations. Also, treatment processes used to address other contaminants have the potential to also significantly reduce methylmercury. Please also see February 2010 TMDL Report Chapter 6 and Basin Plan Amendment staff report Chapter 4.4.4.

6. Require the development and implementation of remedial actions by the State of California to reduce the contribution of legacy mercury in the watershed by at least half, as part of a comprehensive effort to achieve the TMDL. As discussed earlier in this letter, reduction in the legacy component is absolutely essential if the goals in this TMDL are ever to be achieved in the Sacramento Valley watershed. To propose costly measures on other sources when upwards of 75% of the problem goes un-addressed is bad public policy and will not achieve regulatory goals.

We appreciate this important opportunity to comment on the Draft TMDL and provide a modified approach to the current staff proposal. We believe that our modifications will more effectively lead to a defensible and acceptable TMDL that will enable mercury load reduction projects and long-term reduction in fish tissue levels in the Delta.

R-44: In response to this and similar concerns expressed during the stakeholder process, staff added to requirements for upstream TMDLs and open water sources of methylmercury. The draft February 2010 Basin Plan amendments contain a time schedule for the Regional Board to develop major upstream mercury TMDLs by 2017, before the end of Phase 1. The general tributary methylmercury allocations assigned in the Delta mercury program will be assigned to specific responsible parties in the upstream TMDLs. In this way, requirements for tributary sources will be developed in a timely manner while within-Delta methylmercury sources are conducting methylmercury control studies. Actual implementation of remedial actions will be the responsibility of the property owner, which may be the State, and/or entities, such as mining companies, held responsible for mercury discharge.

Attachment A: Summary of Methylmercury Loads & Reductions: Proposed Mercury TMDL for the Sacramento-San Joaquin Delta

R-45: No staff response is necessary for the tables provided in Attachment A. Attachment A can be found at the following Board website:
http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/staff_report_feb08/public_comments_feb08/feb08_stfrpt_mercurystakeholder_com.pdf

Attachment B: Letter submitted on 17 November 2006

Staff completed responses to this letter for the April 2008 Regional Board Hearing. Please note that Board Staff did not update the below responses after the April 2008 hearing and the subsequent stakeholder process. As described above in the responses to the signatories' April 2008 letter, Staff further worked with these stakeholders to reduce the requirements for Phase 1 studies, strengthen the commitment that the Central Valley Water Board will review potential adverse effects of methylmercury controls prior to requiring sources to implement them, and increase responsibility assigned to the State. After discussions with stakeholders, staff did not pursue its suggestion below that Phase 1 study requirements be expanded to include tributary wetlands (response to the fourth recommendation item).

Dear Ms. Creedon:

The undersigned organizations continue to have serious concerns with the direction that the proposed "Basin Plan Amendment to Control Methyl and Total Mercury in the Sacramento-San Joaquin Delta Estuary (Delta)" appears to be heading. We respectfully request a meeting with you to discuss and help formulate alternative approaches to the current staff proposal that we believe can more effectively address health issues related to fish and will advance a sound regulatory process to accomplish public health objectives.

The attached document presents an overview of an alternative approach that recognizes the unique nature of methyl and total mercury in the Delta. Most importantly, the approach calls for a comprehensive and scientific evaluation to characterize methyl-mercury in the Delta, which is a critical foundation to assure an effective regulatory strategy for the Regional Board. Moreover, we believe a broad and diverse working group convened by the California Environmental Protection Agency (CALEPA) and the Water Boards can assist in framing the characterization studies and can help secure the necessary funding for these important efforts.

We look forward to talking with you at your earliest convenience.

On 1 December 2006, Pamela Creedon (Board Executive Officer) and other Board staff met with representatives of Ducks Unlimited, Sacramento Regional County Sanitation District, The Nature Conservancy, Central Valley Clean Water Agencies, City and County of Sacramento Stormwater Programs, California Rice Commission, Sacramento Water Quality Coalition, consultants, and a rice grower. The purpose of the multi-hour meeting of the meeting was to discuss the organizations' concerns. Many of the issues discussed during the meeting were addressed by staff's changes to the draft BPA since June 2006.

**AN ALTERNATIVE APPROACH FOR THE
DELTA METHYLMERCURY BASIN PLAN AMENDMENT**

Methylmercury Calls for a Different Approach. Mercury and methylmercury are different than the other impairments being addressed by the Regional Board. It is widely recognized

by scientists that mercury is a relic pollutant, present in Central Valley watercourses as a result of historic mining and natural erosion. Mercury is not a pollutant that is added to the waterways by any current land uses or water management and the effects of mercury in our watersheds today are not the responsibility of today's water managers, wetlands managers or landowners. For this reason, the traditional Total Maximum Daily Load (TMDL) model simply does not work for mercury or methylmercury.

Although some of the inorganic mercury in the Delta and its tributary watersheds does not come from modern sources, methylmercury is produced by many modern-day activities that humans may be able to modify so that less methylmercury is discharged. As a result, the TMDL model is appropriate. In addition, USEPA staff has indicated an openness to creativity in developing TMDLs. Finally, other models have not yet been identified that comply with Clean Water Act requirements for CWA 303(d) Listed water bodies impaired by a variety of point and nonpoint sources. As a result, Board staff must develop a TMDL that complies with USEPA and Clean Water Act requirements.

The current Regional Board staff proposal follows the traditional TMDL model by arbitrarily pre-assigning responsibility for load allocations throughout the region and then mandating unspecified entities and/or individuals to prepare ad-hoc control studies to help answer questions about mercury in the system, the discharge of mercury and the process of methylation. This proposal, if adopted, would have profound impacts on a variety of state and federal mandates and objectives aimed at improving environmental and public health, particularly those associated with wetland management and restoration within the Delta and its watersheds. A different, more comprehensive, long-term approach is necessary and would be more appropriate for mercury reduction efforts.

In the February 2008 draft BPA and staff reports, staff describes an allocation strategy based on each discharger taking responsibility for its contribution to the Delta impairment. Staff developed allocations that do not incorporate reductions for sources that (a) discharge to areas of the Delta that are not impaired or (b) act as dilution because of their low (< 0.06 ng/l) methylmercury concentrations. This approach is consistent with State Water Board Resolution No. 2005-0060, which required the San Francisco Bay Water Board to incorporate provisions that acknowledge the efforts of those sources whose effluent quality demonstrates good performance and require improvement by other dischargers when establishing allocations. Staff developed allocations for all other Delta source inputs based on the percent reduction needed to achieve safe fish mercury levels in each Delta area. Assigning greater reductions to some sources and no reductions to others would be based solely on a subjective evaluation of which projects are more valuable to the citizens of California, an evaluation that Board staff cannot make. As described in the February 2008 draft BPA, at the end of Phase 1, the Regional Water Board would re-evaluate the methylmercury allocations for all sources and consider whether there needs to be adjustments to the methylmercury allocations. Adjustments may be necessary (a) based on new characterization information, or (b) if the Phase 1 studies are not able to develop effective controls for some sources and no technically valid and legally defensible, long-term offset program is developed.

To clarify, staff recommends that dischargers conduct Phase 1 studies to evaluate their own discharges. Staff does not recommend that every individual NPDES, MS4, and agricultural and wetland landowner individually conduct a study, but instead recommends coordinated studies. Also, load allocations for irrigated agriculture and wetlands in the Delta are assigned on a Delta subarea basis; that is, allocations within each subarea are grouped for these two categories. Agricultural and wetland landowners are not required by the proposed program to individually

evaluate and reduce their loads; however, there needs to be a coordinated effort to identify significant methylmercury sources and develop management practices for these discharges.

It is not staff's intent to develop a control program that prevents beneficial projects from taking place. Staff attempted to address these concerns in the February 2008 draft staff reports, in April 2008 Board hearing staff presentation, and in the follow-up document, "Staff's Initial Responses to Board and Stakeholder Questions and Comments at the April 2008 Hearing" (see items A-3 and A-4). To summarize, many modern human activities – including beneficial activities – may affect methylmercury levels in the Delta. Staff proposed a phased, adaptive strategy that allows time in Phase 1 for studies to take place and the opportunity for the control program and associated allocations to be revised at the end of Phase 1. In addition, staff presented an option at the April 2008 hearing to modify the draft BPA implementation requirements such that no Phase 2 methylmercury implementation actions would be required in the Delta and Yolo Bypass until the Board has developed tributary TMDL control programs. Under this approach, staff would develop the upstream control programs during Phase 1 and have a more comprehensive plan for controlling tributary inputs to the Delta when staff returns to the Board after the Phase 1 methylmercury studies are completed. This and other options can be further discussed during the stakeholder collaboration process.

Even if there were no Delta mercury control program, project proponents for the majority of new projects developed to address state and federal mandates and objectives would be required under the California Environmental Quality Act (CEQA) to:

- Evaluate the projects' potential effects on methylmercury levels in the Delta and tributaries in addition to other water quality concerns,
- Evaluate the potential environmental consequences of implementing methylmercury controls should the project evaluation indicate that methylmercury mitigation may be necessary, and
- Considered and incorporate mitigation to address methylmercury-related impacts when and where appropriate.

For example, the 2000 CalFed Record of Decision found that extensive restoration efforts in the Delta have the potential to increase exposure of people and wildlife to methylmercury and that methylmercury mitigation should be developed for wetlands prior to their construction.

The Need for Comprehensive and Coordinated Control Studies. There is general agreement that additional characterization and control studies are necessary for mercury and methylmercury. Rather than proceed in the proposed manner haphazardly by pre-assigning responsibility to unspecified entities for mercury load allocations in the Delta and Central Valley, a more sound approach would be for California Environmental Protection Agency (CALEPA) and the Water Boards, in coordination with resource agencies and others, to convene a working group to help frame and coordinate the necessary characterization studies. This workgroup would help develop a strategic overarching plan to study mercury and its methylation in the Delta and could help secure funding for the effort to develop a feasible TMDL. The results from this coordinated approach would then guide future regulatory actions by the Central Valley Regional Board and could serve as a model for addressing mercury impairments in the rest of the state.

After the release of the June 2006 draft BPA, staff added BPA language for forming a Technical Advisory Committee (TAC) of independent, scientific experts to oversee the methylmercury study design and review study results. This independent committee also would help inform the Board at the end of Phase 1. Staff agrees that convening a stakeholder working group that

works with the TAC to design the studies can be an effective way of (a) developing, and securing funding for, coordinated study plans, and then conducting the studies and reviewing the results and (b) helping to develop a feasible TMDL Phase 2 implementation program. The TAC could provide expert opinion and recommendations to the stakeholder working group regarding study design and interpretation of study results.

Allocations are a required element of TMDL programs. Waiting until the completion of Phase 1 studies to assign allocations will not comply with USEPA and Clean Water Act requirements for the development of a TMDL program. The adaptive strategy proposed in the February 2008 draft BPA would allow for the modification of the allocations based on new information at the end of Phase 1, before implementation would be required.

The Control Studies Should Begin with a Strong Scientific Program. A good starting foundation for this effort is the 2003 “Mercury Strategy for the Bay-Delta Ecosystem: A Unifying Framework for Science, Adaptive Management and Ecological Restoration” that was prepared for the Bay-Delta Authority. Here, the CALFED Bay-Delta Program coordinated an aggressive effort to look at mercury in the Bay-Delta over the past decade and has conducted numerous studies and made several recommendations that would help inform the state agencies on a comprehensive study plan for methyl and total mercury. We are waiting for the final review and synthesis of this \$30 million program. We are confident that this comprehensive approach will be completed more quickly and be more comprehensive than the ad-hoc studies by individual entities that will emerge from any pre-assignment of responsibility.

Staff agrees that 2003 Mercury Strategy for the Bay-Delta Ecosystem is a good starting foundation for the development of a Delta mercury control program and based much of the draft BPA and staff reports on data and concepts expressed in the 2003 Mercury Strategy and other CALFED Mercury Program reports. Staff is currently reviewing the CALFED Mercury Program reports to re-evaluate the February 2008 TMDL calculations and concepts.

Staff’s recommended approach for Phase 1 studies includes both characterization and control studies for methylmercury sources. The recent CALFED studies were almost entirely focused on characterization of general methylmercury processes and some specific nonpoint sources (e.g., wetlands); there was little focus on developing specific methylmercury management practices. Coordinated, comprehensive studies will be needed to develop and evaluate management practices for point and nonpoint sources of methylmercury and total mercury.

The Regional Board Should Pursue Flexible Tools to Address Mercury that Do Not Pit Environmental Objectives Against One Another. Under the TMDL regulations, the Regional Board can provide reasonable assurances that load allocations will be developed when the science supports an allocation and there is a methodical way to allocate responsibility in a legally appropriate manner. While the control studies are underway, creative and flexible compliance approaches can and should be immediately pursued with interested parties. This should include an offset program and should recognize the broad and diverse scope of wetland habitat types in the Central Valley that are managed in different ways at different times of the year.

It is not Board staff’s intent to pit environmental objectives against one another. However, the federal Clean Water Act requires that States list water bodies that do not meet water quality standards (i.e., are impaired) and develop programs to correct the impairment. Federal law does not give the State license to allow the methylmercury impairment to remain or worsen in trade for other environmental improvements. Even so, the Central Valley Water Board does have flexibility in deciding how the methylmercury reductions will be achieved. Somehow we must

develop coordinated programs that address multiple impairments, protect all beneficial uses (e.g., protect critical wildlife habitat and protect wildlife and humans who consume Delta fish), and achieve environmental objectives (e.g., restore critical wildlife habitat). This is a daunting effort and is the reason staff recommended a phased approach to TMDL implementation in the February 2008 draft BPA and staff reports. This concern should be further discussed with stakeholders.

Staff agrees that the program should include flexibility of offsets. Based on stakeholder comments, staff included language in the February 2008 draft BPA (pages BPA-13 through BPA-15) that outlines guidance criteria and a credit strategy for voluntary Phase 1 pilot offset projects. Staff's rationale for the Phase 1 pilot offset project guidance criteria was described in the February 2008 draft BPA report and further summarized and discussed in the April 2008 hearing meeting and in the follow-up document, "Staff's Initial Responses to Board and Stakeholder Questions and Comments at the April 2008 Hearing"¹² (see item A-5, pages 23 through 28).

Staff agrees that it is critical to recognize and evaluate the variety of wetland habitat types and management practices in the Central Valley. The 2008 CALFED Mercury Program highlighted the differences in net methylmercury production and degradation in different types of wetlands in the Delta region. More studies are needed to characterize wetlands in the tributary watersheds and to evaluate potential methylmercury management practices for wetlands in the Delta and its tributary watersheds. Staff recommends that these be goals of the Phase 1 studies proposed in the February 2008 draft BPA. The February 2008 draft BPA focused on wetlands in the Delta, but during the stakeholder collaboration process we can consider extending study requirements to wetlands in the tributary watersheds.

The State of California Should Fund These Studies. Californians all share the concern about mercury and methylmercury in fish and other wildlife. As a relic pollutant, controlling mercury is a large societal issue that is in the public interest and the characterization studies and related work should be supported by broad public funding from throughout the State. The proposed "Mercury Monitoring and Remediation Fund" proposed in AB 2901 (Wolk) or a similar mechanism would help serve this purpose.

Staff agrees that proposed "Mercury Monitoring and Remediation Fund" proposed in AB 2901 (Wolk) or a similar mechanism would help serve this purpose. Staff of State agencies will likely need the help of other stakeholders to advocate for greater funding through State programs for methylmercury studies and methylmercury and mercury implementation actions.

¹² Available at: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/stakeholder_meetings/25nov08_hearing_rtc.pdf

4. Center for Environmental Health

Letter date: 23 April 2008

From: *Christine G. Cordero, Community Health Program Coordinator, Center for Environmental Health (CEH), Oakland, CA*

Thank you for the opportunity to share our views on the proposed methylmercury TMDL for the Delta. The Center for Environmental Health wishes to acknowledge the Regional Board Staff's hard work on this plan and approve of their focus on methylmercury as a means of protecting public health and the environment.

The Center for Environmental Health works to eliminate the threats harmful chemicals like methylmercury, pose to children, families, and communities. Many people in communities we work with fish regularly and often consume higher levels of Delta fish than is considered safe due to methylmercury and other contaminants. We believe that they have the right to fish and consume their catch, whether for cultural, recreational, or economic reasons, without risking their families' health and safety. While we recognize that addressing the mercury problem in the delta can be complex, we believe that it is the responsibility of the Board to ensure that we do all we can to reduce methylmercury in the watershed in as rapid and complete manner as possible.

We are seriously concerned that the proposed plan will not adequately protect communities for the following reasons:

- **Staff recommends a fish tissue target that will allow people to only eat popular species of locally caught fish once a week, disregarding the fact that many in the Delta's diverse population consume significantly higher levels as a major part of their diet. Such a limited goal will only put our families at continued risk.**
- **The TMDL delays taking action to reduce methylmercury levels for 8 years while more studies are done, despite the fact that people, especially those in disadvantaged communities or communities of color, are being affected today.**
- **While Staff appropriately includes exposure reduction language from State Board Resolution 2005-0060, the implementation and program evaluation requirements focus on risk communication and do not adequately address mitigating health impacts from mercury contamination or actions to reduce actual exposure.**

R-46: Please see staff's responses below that follow each detailed comment.

We believe these problems can be corrected. Specifically we recommend that:

1. **The Board adopt a fish tissue objective that will better protect subsistence fishers and their families. Staff's Alternative 5 would allow 4 or 5 meals a week, and comes closer to what is happening in many households. We believe that as research continues in the Delta, this goal can be achieved.**

R-47: Staff recognizes that there are people who eat more than one meal per week of Delta fish. In recommending fish tissue objectives, however, staff also needed to consider whether the objective can be attained. Staff recommends water quality objectives that are as protective as possible while having a reasonable assurance of being achieved. A recent study of fish mercury levels in the western United States found few water bodies where fish levels are lower than the proposed objective. The study indicates that methylmercury levels in top trophic level fish lower than the recommended objective may not be achievable in the Delta. The Central Valley Water Board will review the Delta methylmercury control program at the end of

the Phase 1 methylmercury study period. If research shows that methylmercury controls will be more successful than anticipated, the Board could decide to lower the fish tissue objective. Following discussions with CIEA and others during the stakeholder process, staff added to the February 2010 draft Basin Plan amendments this statement: “The long-term goal of the mercury program is to enable people to safely eat four to five meals per week of Delta fish”.

- 2. Sources of methyl and elemental mercury should be required to begin reducing their loads now, based on current knowledge. An adaptive management plan would allow such strategies to be improved as research and monitoring provides more information.**

R-48: Staff believes that the study period is necessary in order to develop and test ways to control methylmercury in wetlands, treatment facilities, agricultural drains, and other sources. The draft February 2010 Basin Plan amendments state, “During Phase 1, all dischargers should implement methylmercury management practices that are reasonable and feasible”. The proposed Basin Plan Amendment requires that some mercury controls be implemented while the methylmercury studies are proceeding. During Phase 1, wastewater treatment facilities and urban runoff treatment systems would be required to implement mercury minimization programs and report their activities to control mercury loads to the Board. Requirements for dredging and dredge material reuse activities to minimize mercury and methylmercury discharges would start at the beginning of Phase 1. A schedule for improvements at the Cache Creek Settling Basin (a major mercury source) would run concurrently with the methylmercury study period.

- 3. Exposure reduction language should be expanded to include *“Coordination with affected communities to develop and implement exposure management programs that meet their particular needs, possibly including providing access to fish with less mercury or other protein sources and supporting or funding programs which address community health problems exacerbated by consumption of mercury in fish.”* Furthermore, evaluation of exposure reduction programs should include reporting on such actions.**

The Regional Board has the opportunity to ensure that this TMDL puts the interests of environmental justice and our most impacted communities first. As residents of the Delta region, we believe this is the only way we can be assured that our precious water sources are cleaned up and that our people will live in a healthy and safe environment.

R-49: The draft Basin Plan Amendments require that dischargers work with affected communities and public health agencies to develop and implement an exposure reduction program to reduce mercury exposure to people who eat Delta fish. Staff recognizes that community involvement is crucial. Funded by the Central Valley Water Board, staff of the UC Davis Department of Environmental Science and Policy and the Southeast Asian Assistance Center developed a report, “Community-Based Strategies to Reduce Mercury Exposure in Delta Fishing Communities”, which clearly points out the needs and benefits of including community organizations and fish-consuming residents.

R-50: The draft Basin Plan amendments do not identify particular exposure reduction activities. As recommended by the UC Davis report, affected communities should be given opportunities to identify their preferred risk management activities when the Delta TMDL’s exposure reduction program begins, after adoption of the Basin Plan amendment. The Exposure Reduction Program can encompass activities for reducing mercury exposure that go beyond public outreach and education. To ensure a broad interpretation of possible activities, the proposed Basin Plan amendment section is titled “Exposure Reduction”, instead of “Public

Outreach”. The section lists objectives for the exposure reduction program, including “reduce actual and potential mercury exposure of Delta fish consumers most likely affected by mercury” and “develop and implement community-driven activities to reduce mercury exposure”.

R-51: If an affected community determines that providing access to other protein sources is needed to enable their subsistence fishers to reduce their mercury exposure, the current draft Basin Plan amendment language would allow this activity. Board staff recommends that such an activity be assisted by local and/or State agencies and other entities with expertise in nutrition education and supplementation.

5. Central Valley Clean Water Association

Letter date: 9 April 2008

From: Debbie Webster, Executive Officer, Central Valley Clean Water Association (CVCWA)

Thank you for providing this opportunity to review and comment on the subject TMDL. The Basin Plan Amendment and staff reports were made available for public review and comment in February 2008. Comments provided in this letter focus on the Basin Plan Amendment. The Central Valley Clean Water Association (CVCWA) is a consortium of 60 publicly owned treatment works (POTWs) in the Central Valley. CVCWA's primary purpose is to exchange information and provide a unified voice on regulatory issues impacting POTWs throughout the Central Valley. POTWs want to participate in solutions to difficult problems such as mercury. It is our intention that these comments serve to improve the TMDL, particularly in recognition that we already serve the public trust by removing mercury from our waters and represent a de minimus source of mercury to the Delta.

The Central Valley Regional Water Quality Control Board (Regional Board) and staff must recognize that the charge of POTW operators in California is to protect the environment in the most cost-effective, responsible way. As a government agency responsible to the people of California, the Regional Board should fully evaluate and compare the relative costs and benefits of the complete range of alternatives.

R-52: To clarify, the February 2008 and February 2010 Basin Plan amendment draft staff reports provided cost estimates for the Phase 1 studies and potential implementation options staff had the ability to identify, but they did not attempt to quantify a dollar amount for the benefits of reducing fish mercury levels. A more comprehensive cost evaluation will be possible after the Phase 1 studies are completed and upstream TMDL programs are developed.

R-53: It is very difficult to quantify or place a value on reducing the mercury levels in fish. There are benefits to both people and wildlife if they consume less contaminated fish. The Central Valley Water Board is not legally required to estimate the value of resources as part of the economic considerations. However, because information is available on the value of the Delta fishery and the potential costs of mercury intake by people, such information was summarized in Section 3.2.4 of the draft Basin Plan amendment staff report. However, staff does not have dollar estimates for the benefits of reducing Delta fish mercury levels under the different alternatives evaluated in the draft BPA staff report.

R-54: Note, the Porter-Cologne Water Quality Control Act and the California Environmental Quality Act (CEQA) do not require the State and Regional Water Boards to conduct a cost-benefit analysis (i.e., compare costs to benefits achieved) as part of the basin planning and CEQA processes for TMDLs.

We are committed to working with you and the Regional Board staff to identify reasonable initial steps and workable provisions to clarify and provide specific adaptive management practices and flexibility to adjust the TMDL implementation plan.

As described below, there are five important comments that we still wish to bring to the attention of the Regional Board:

- 1) Use a different approach for management of methylmercury.**
- 2) Address the majority of the mercury load to the Delta prior to implementing Phase 2 of this TMDL.**

- 3) Focus mercury control requirements on total mercury until the linkage between methylmercury sources and mercury in fish tissue is better characterized.
- 4) Support rather than discourage mercury offsets.
- 5) Promote regional monitoring rather than require discharger-specific receiving water monitoring.

1. Use a Different Approach to Control Methylmercury

Methylmercury is different than other impairments addressed by the Regional Board. Scientists widely recognize that mercury is a naturally-occurring element and a legacy pollutant, present in Central Valley water bodies as a result of historic mining, mineral springs, natural erosion and atmospheric deposition. Mercury is not a pollutant that is added to sewer systems at a significant rate by domestic or industrial customers.

R-55: To clarify, although much of the inorganic mercury in the Delta and its tributary watersheds may not come from modern sources, methylmercury is produced by many modern-day activities that humans may be able to modify so that less methylmercury is discharged.

R-56: In addition, without the completion of additional control studies, it is not yet possible to define which sources are “significant” or “insignificant” or which are feasible or make sense to control. When discussing the importance of different sources, many stakeholders have focused on the amount of loading by source category and by individual discharge. However, staff recommends that additional factors be considered. Given how many individual discharges there are in each source category in the Delta, almost all of the individual discharges are small. And, although the tributary inputs are substantial, available information indicates that they also contain a similar distribution of individual discharges. Examples of small discharges include most wastewater treatment plants, individual farm fields, and wetlands where water flow is managed in discrete units. It is the sum of all of the individual discharges in the Delta and its tributary watersheds that impairs the Delta. Each of the individual discharges has its own intrinsic value and financial constraints. As a result, the importance or insignificance of different methylmercury and total mercury sources could be defined by: (a) their load, (b) their distance from an impaired area, (c) how big of a reduction is needed to achieve safe fish mercury levels in a given impaired area, (d) whether they can be controlled, (e) whether they can be controlled without impacting habitat function, (f) the cost to control them, and (g) the resources available to the responsible parties to implement controls. It is conceivable that the control program will need to focus on just a few large projects in some watersheds, but many small projects in other watersheds, to achieve safe fish mercury levels throughout the Delta and its tributary watersheds. This topic will receive additional review and discussion throughout the implementation of the Delta Mercury Control Program, especially during the Phase 1 Program Review that is an element of the adaptive management approach included in the February 2010 draft Basin Plan amendments.

Recent mercury TMDLs in Minnesota¹ (covering two-thirds of the state’s listed water bodies) and in seven Northeast states² (covering over 10,000 water bodies and 46,000 river miles) have taken a prudent approach that CVCWA believes would be appropriate for the Delta as well. Those TMDLs recognize that the major source (>97%) of total mercury in the environment is atmospheric deposition. Given the magnitude of the reductions required to implement the TMDLs, the regulators recognized that they could not reduce in-region sources further to compensate for insufficient reductions from out-of-region or otherwise uncontrollable sources. Instead of implementing wasteload allocations (WLAs) among individual sources within the state or region, mercury reduction is being accomplished through mercury minimization plans and the continuation of region-wide mercury reduction efforts. [*Footnote 1: Minnesota Statewide Mercury Total Maximum Daily Load*

(2007). By Minnesota Pollution Control Agency. Submitted March 27. Footnote 2: Northeast Regional Mercury Total Maximum Daily Load (2007). By Connecticut Department of Environmental Protection (DEP), Maine DEP, Massachusetts DEP, New Hampshire Department of Environmental Services, New York State Department of Environmental Conservation, Rhode Island Department of Environmental Management, Vermont Department of Environmental Conservation, New England Interstate Water Pollution Control Commission. Submitted October 24.]

R-57: To clarify, the Minnesota TMDL wasteload allocations for NPDES sources are equivalent to caps for each region that include reserve capacity. As stated in its March 2007 report:

“Rather than assign an allocation to each source based on their current design capacity, continued mercury reduction will be encouraged through mercury minimization plans and enhanced phosphorus removal. EPA has determined, as a matter of policy, that NPDES point sources known to discharge mercury at levels above the amount present in the source water should reduce their loadings of mercury using appropriate, cost-effective, mercury minimization measures to ensure that the total aggregate point source mercury discharges are at a level equal to or less than the WLA specified in this TMDL. The reserve capacity in the WLA allows for permitting of additional wastewater discharges, but does not preclude the requirement of mercury minimization plans.”

R-58: The Northeast States’ TMDL has a similar approach. In addition, its October 2007 report stated:

“EPA believes that a requirement to develop a MMP < mercury minimization plan> may provide dischargers with sufficient information to voluntarily and economically reduce mercury discharges (EPA 2006a). Evaluation of progress at the Phase II milestone will determine if mercury minimization plans and additional monitoring at point sources should be prescribed for dischargers that do not already have those programs in place. All new or increased discharges will be required to stay below the regional WLA.”

R-59: First, Board staff has reviewed the USEPA’s “Elements of Mercury TMDLs Where Mercury Loadings are Predominantly from Air Deposition” (September 2008 Office of Wetlands, Oceans and Watersheds, pages 12-14) and corresponded with USEPA Region 9 staff, who also corresponded with USEPA HQ staff, regarding the approval of regional “aggregated” allocations for point sources. USEPA staff confirmed what was written in the September 2008 document, that an aggregate WLA is appropriate in mercury TMDLs only if the mercury is predominantly from air deposition and the contributions from individual point sources are very small. This approach is not appropriate for the Delta because there are legacy, local, and atmospheric sources.

R-60: USEPA staff and Water Board staff are open to evaluating the concept of regional wasteload allocations for NPDES discharges (e.g., by Delta subarea and/or by tributary watershed) in a manner similar to that done by the San Francisco Bay Water Board. A region-wide watershed permit (Order No. R2-2007-0077¹³) was approved for municipal and industrial wastewater discharges of mercury to San Francisco Bay to implement the San Francisco Bay Mercury TMDL. The watershed permit includes an annual “aggregate mass emission limit” and average annual mass and concentration limits for individual dischargers with phased interim

¹³ Available at: http://www.swrcb.ca.gov/rwqcb2/board_decisions/adopted_orders/2007/november/8/r2-2007-0077final.pdf

mass limits for the next two ten-year periods. The Bay's watershed permit states that the region-wide load limit is met if the sum of all individual dischargers' mercury mass emissions is not greater than the aggregate mass emission limit. If the aggregate mass limit is exceeded, the discharger(s) "whose mercury mass emission(s) exceed(s) its (their) individual limitation(s) in Table 6, shall be deemed to be in violation of its (their) mercury mass limitation(s)." A similar phased approach may be possible for NPDES discharges of inorganic mercury and methylmercury in the Central Valley and can be further explored during the Phase 1 period of the proposed control program described in the February 2010 draft Basin Plan amendments. The proposed control program would not require NPDES permittees to implement methylmercury controls to achieve the methylmercury allocations until Phase 2 of the proposed control program, after about 2020.

R-61: The TMDLs for Minnesota and seven other Northeast states will lower loads of inorganic mercury, in part, by requiring wastewater treatment plants to implement mercury minimization plans to reduce mercury entering and exiting the plants, and by other state or regional mercury reduction efforts, including disposal and product bans, that limit mercury in household and industrial uses. The February 2010 draft BPA for the Delta requires that all NPDES facilities and large MS4s in the Delta and Yolo Bypass develop and implement mercury minimization plans during Phase 1. Many of the NPDES dischargers are already required to do this by their existing NPDES permits. Section 4.3 and Appendix C of the February 2010 Delta Basin Plan amendment draft staff report describe reasonably foreseeable methods of compliance with these requirements, many of which mirror the mercury minimization measures incorporated in the Minnesota TMDL. The February 2010 draft BPA contains performance-based interim total mercury mass limits to allow for permitting additional wastewater discharges during Phase 1.

R-62: Mercury minimization measures have the potential to reduce NPDES methylmercury discharges, possibly enough for some facilities to achieve the proposed methylmercury allocations. For example, during the April 2008 hearing, SRCSD's District Engineer said that the SRCSD WWTP's effluent total mercury and methylmercury decreased as a result of influent total mercury decreases associated with the initiation of their "Be Mercury Free" source control program. Board staff's calculations indicate that the SRCSD WWTP's annual average methylmercury discharge during recent years (2005-2007, ~95 g/yr) comes very close to meeting staff's proposed allocation for the SRCSD WWTP (89 g/yr).

R-63: In addition, upgrades to the City of Stockton WWTP completed in September 2006 to meet new ammonia effluent limits and Title 22 (or equivalent) tertiary requirements appear to have led to reductions in total mercury and methylmercury as well as ammonia. A comparison of WWTP effluent ammonia, total mercury and methylmercury data collected before (August 2004-July 2005) and after (January-July 2009) the treatment plant upgrade indicates that since the WWTP was upgraded, average effluent ammonia concentrations decreased by 95% and average inorganic mercury concentrations decreased by 83%. Methylmercury effluent concentrations decreased by 91% (0.08 ng/l average, seven monthly samples) after the plant upgrade. (See Section 6.2.3.1 in Chapter 6 of the February 2010 TMDL Report for more discussion.) Although it is not known if the treatment plant upgrades are responsible for the mercury and methylmercury reductions, or if the reductions are a result of other operational or physical changes, these results are very promising. Additional sampling may be needed to determine the cause of the decrease. As more data are collected (perhaps by the proposed Phase 1 methylmercury control studies), Board staff will work with City of Stockton staff to evaluate whether the above trends are representative of current conditions.

R-64: As evidenced by the recent effluent monitoring results for the SRCSD and Stockton WWTPs, by focusing on reducing inorganic mercury and other pollutants in their discharges, some facilities may be able to achieve the methylmercury allocations proposed in the February 2010 draft BPA.

Under certain circumstances, it may be reasonable for POTWs in the Central Valley to go beyond the requirements in Minnesota's and the Northeast states' TMDLs and conduct methylmercury characterization and control studies; but the Regional Board should only require such expensive scientific studies if there is a commensurate benefit.

R-65: In the February 2008 staff report, Board staff attempted to link the level of effort and resources required for Phase 1 control studies to the relative magnitude of the source when developing criteria to evaluate different alternatives for determining which sources should be required to conduct studies (see Section 4.2.1 Consideration #9 in the February 2008 draft BPA staff report, and updated text for Consideration #9 in the February 2010 draft BPA staff report). Also, most NPDES facilities have already conducted effluent methylmercury monitoring adequate to characterize their discharges, and some comparative analyses of treatment systems have already been done.¹⁴ This topic was further explored by the 2008-2009 Stakeholder Process. CVCWA was a very active participant in the 2008-2009 Stakeholder Process. The new Phase 1 methylmercury control study requirements proposed in the February 2010 draft Basin Plan amendments and accompanying staff report directly reflect the input from CVCWA and other stakeholders who participated in the 2008-2009 Stakeholder Process.

R-66: As noted in responses to previous CVCWA comments in this document, it is very difficult to quantify the benefit of reducing the methylmercury levels in fish compared to the benefit of other human activities that discharge mercury and methylmercury, and to determine which sources are significant until additional tributary watershed source analyses and control studies take place. In addition, federal law does not give the State license to allow the methylmercury impairment to remain or worsen in trade for other environmental improvements. Methods to determine "commensurate benefit" that comply with the Clean Water Act can be explored by the stakeholder collaboration process throughout the Phase 1 study period and Phase 1 Program Review. Note, while the State and Regional Water Boards must consider the potential costs of reasonably foreseeable methods of compliance with the proposed BPA, the Porter-Cologne Water Quality Control Act and the California Environmental Quality Act (CEQA) do not require the State and Regional Water Boards to conduct a cost-benefit analysis (i.e., compare costs to benefits achieved) as part of the basin planning and CEQA processes for TMDLs.

R-67: In addition, Board staff has corresponded with USEPA Region 9 staff regarding whether or not to require methylmercury-specific studies and control actions. USEPA staff noted that the San Francisco Bay Water Board required methylmercury-specific implementation actions within the San Francisco Bay mercury control program and that the USEPA supports the

¹⁴ For example: (1) Pirondini, T. 2008. "Comparison of Methylmercury (MeHg) in Effluents vs. Wastewater Treatment Processes". Preliminary evaluation by the Central Valley Clean Water Agencies dated 20 February 2007. Provided in a Microsoft Excel file by Tony Pirondini (Laboratory Supervisor, Vacaville Water Quality Laboratory) to Michelle Wood (Environmental Scientist, California Regional Water Quality Control Board, Central Valley Region, Sacramento).

(2) Bosworth, D.H., S.J. Louie, M.L. Wood, D.J. Little, and H. Kulesza. 2010. A Review of Methylmercury Discharges from NPDES Facilities in California's Central Valley. California Regional Water Quality Control Board, Central Valley Region, Final Staff Report. March 2010.

inclusions of methylmercury implementation actions for the Delta program. The San Francisco Bay mercury control program requires Bay dischargers to address methylmercury, in particular:

- NPDES dischargers, dredging projects, and wetland projects are required to monitor MeHg and do MeHg studies.
- Dredging and disposal operations are required to demonstrate that their activities do not increase the bioavailability of mercury.
- Wetland restoration projects are required to be designed and operated to minimize MeHg production and result in no net increase in mercury or MeHg loads to San Francisco Bay.

Requiring narrowly focused control measures, such as altering wetland designs or management practices to reduce methylation, would follow the practice of “serial engineering” in the Delta of creating new, unexpected problems while trying to solve others. Delta mercury TMDL peer reviewer Professor Alex Horne commented strongly on this point, stating “Urgently needed is a trade (offset) between wetlands restoration benefits and [methylmercury] production. A minimum of 300,000 acres of restored wetland are needed since about 850,000 were lost. All other concerns are relatively minor.”

R-68: The federal Clean Water Act requires that States list water bodies that do not meet water quality standards (i.e., are impaired) and develop programs to correct the impairment. Federal law does not give the State license to allow the methylmercury impairment to remain or worsen in trade for other environmental improvements. The overall requirement of reducing methylmercury is thus established. However, the Central Valley Water Board does have flexibility in deciding how the methylmercury reductions will be achieved. If presented with convincing evidence (e.g., the results of the proposed Phase 1 studies) that implementing management practices to reduce methylmercury discharges from wetlands would cause harm to habitat function or sensitive wildlife species, the Board could adjust the allocation scheme. (Albeit, other methylmercury sources would have to be reduced by a greater amount to compensate for methylmercury discharges from existing and new wetland restoration projects that produce methylmercury.) Staff agrees that there needs to be a balance between reducing methylmercury produced by wetlands and protecting ecological benefits provided by wetlands.

R-69: Dr. Horne describes the levels of methylmercury in the Delta as minor. However, in 1971 a human health warning was issued for the Delta warning against the consumption of mercury-contaminated sturgeon and striped bass from the Delta. In 2009, the Office of Environmental Health Hazard Assessment (OEHHA) issued updated safe eating guidelines for the Central and South Delta (including the San Joaquin River from the Port of Stockton to Pittsburg), the San Joaquin River from Friant Dam to the Port of Stockton, the Sacramento River and Northern Delta, the lower Cosumnes River, and the lower Mokelumne River. In the guidelines, OEHHA advises that pregnant and nursing women and children avoid consuming bass (largemouth and striped) and Sacramento pikeminnow from the San Joaquin, Sacramento and lower Cosumnes and lower Mokelumne Rivers. In surveys of consumers of Delta fish, the Department of Health Services Environmental Health Investigations Branch has found that people routinely eat Delta fish, of these and other species, in excess of the safe human intake level of methylmercury (USEPA’s methylmercury reference dose). Until recently, there has been little attention given to methylmercury production in wetland restoration efforts. While ecological and human benefits of wetlands are being realized, human exposure to methylmercury through contaminated fish must not be ignored and should be minimized.

R-70: In addition, methylmercury risks to Delta wildlife are still presumed to occur. Although Delta-specific exposure and effect studies for wildlife are lacking, concentrations of methylmercury measured in Delta fish are above levels observed in field and laboratory studies elsewhere that harm wildlife species. For example, the highest fish tissue levels observed in the Delta were in the lower Cosumnes River (Davis *et al.*, 2008; Slotton *et al.*, 2007¹⁵), an area of intensive wetland restoration efforts. Extensive multi-year and seasonal fish mercury monitoring conducted in the lower Cosumnes River after the development of the TMDL source analysis observed small fish mercury levels that were 5 to 29 times the small fish mercury objective proposed in Chapter 3 of the draft Basin Plan Amendment report. Slotton and others (2007, pages 58-59) observed extreme (400-500%) increases in silverside mercury at the Cosumnes site in July 2006, when concentrations in 45-75 mm (2-3 inch) silversides reached levels averaging an “astounding” 0.869 ppm, with individual fish as high as 2.0 ppm. According to the authors, “these were concentrations that should be of serious concern, particularly in relation to wildlife exposure.”

The presence of total mercury is a necessary precursor for methylmercury production. A prudent approach to begin addressing mercury impairment in the Delta is to focus initial control efforts on total mercury source control. Much of the proposed TMDL requirements for total mercury control are reasonable and already being implemented by many POTWs. The methylmercury requirements in the proposed TMDL, in contrast, can not be expected to identify feasible control measures that lead to measurable reductions in methylmercury levels in Delta fish, due to fluctuations of water column concentrations of methylmercury resulting from the natural decomposition of organic matter.

R-71: Staff agrees that it makes sense to focus on total mercury source controls and implementation of mercury minimization plans during Phase 1 while the methylmercury studies are in progress.

R-72: Although natural fluctuations occur in methylmercury levels in the water column and fish in the Delta, methylmercury persists long enough in tributary and Delta waters to be reflected in fish uptake, with regional fish mercury patterns that stay consistent over years (e.g., Davis *et al.*, 2003 and 2008¹⁶). The 2008 CALFED reports contain load analyses and mass balances for methylmercury in the Delta and Sacramento and San Joaquin Rivers. Methylmercury concentrations and loads are correlated with identifiable factors, such as water residence time, tributary and other source inputs and rates of removal from the water column by photodemethylation and deposition. The magnitude of effects of these factors on methylmercury is greater than that seen by natural fluctuations. Thus, the researchers were

¹⁵ Davis, J.A., B.K. Greenfield, G. Ichikawa, and M. Stephenson. 2008. Mercury in sport fish from the Sacramento San Joaquin Delta region, California, USA. *Science of the Total Environment*, 391:66-75.

Slotton, D.G., S.M. Ayers, and R.D. Weyland. 2007. CBDA Biosentinel Mercury Monitoring Program, Second Year Draft Data Report Covering Sampling Conducted February through December 2006. May 29, 2007. Available at: <http://www.sfei.org/cmr/fishmercury/DocumentsPage.htm>

¹⁶ Davis, J.A, B.K. Greenfield, G. Ichikawa and M. Stephenson. 2003. Mercury in Sport Fish from the Delta Region. Final report submitted to the CALFED Bay-Delta Program for the project: An Assessment of the Ecological and Human Health Impacts of Mercury in the Bay-Delta Watershed (Task 2A). San Francisco Estuary Institute and Moss Landing Marine Laboratories. Available at: <http://loer.tamug.tamu.edu/calfed/FinalReports.htm>.

Davis, J.A., B.K. Greenfield, G. Ichikawa, and M. Stephenson. 2008. Mercury in sport fish from the Sacramento San Joaquin Delta region, California, USA. *Science of the Total Environment*, 391:66-75.

able to data for these and other variables in a mathematical model that effectively tracked methylmercury loads across the Delta.

R-73: Staff has identified only a few circumstances where an individual mercury or methylmercury discharge (e.g., individual WWTP or floodplain) causes measurable increases in fish in the Delta. It is the sum of all of the individual discharges in the Delta and its tributary watersheds that impairs Delta waterways. The load and wasteload allocations included in the draft Basin Plan amendments assign an equitable distribution of responsibility between point and nonpoint sources within the Delta and inputs from the Delta's tributary watersheds. Allocations are based on methylmercury mass discharges from the point and nonpoint sources rather than the amount of measurable methylmercury increase in downstream Delta water and fish resulting from the discharges. With only a few exceptions (see Chapter 8 in the February 2010 TMDL Report), point and nonpoint source discharges are assigned an equal percent reduction by the proposed allocations. This approach is reasonable, given both the federal requirements for TMDLs and the sheer magnitude of the river flows through the Delta. For example, the Sacramento River is the largest river in California and drains a 27,000 square-mile area – almost one fifth of the State of California and about one half of the Central Valley. It is not surprising that two of the largest individual methylmercury inputs to the Delta identified in the TMDL Report (Cache Creek Settling Basin [137 g/yr] and SRCSD Sacramento River WWTP [161 g/yr]; see Tables 6.2 and 6.5 in the February 2010 TMDL Report) are each only about 7% and 8%, respectively, of the Sacramento River's input to the Delta at Freeport (2,026 g/yr during the relatively dry WY2000-2003 TMDL period). However, as noted as early as 1997 in the Sacramento River Mercury Control Planning Project report prepared for SRCSD by Larry Walker Associates, "... mercury sources in the study area appear to be diffusely distributed without any significant "hotspots" ..." (LWA, 1997,¹⁷ page 31). This is expected to be true for both methylmercury and inorganic mercury sources in the Sacramento River watershed and other watersheds that drain to the Delta. As a result, it would not be reasonable to require only those sources that cause a measurable increase in receiving water methylmercury concentrations to reduce their discharges.

R-74: Staff does not recommend having the control studies evaluate the effectiveness of source control methods by measuring the methylmercury concentrations in fish or water downstream of an individual source discharge, but instead by measuring the methylmercury load in a source's discharge and its influent/inflow/irrigation water.

R-75: In addition, "natural" variability can be evaluated in terms of individual sources. For example, open-water habitats with sandy substrates tend to be less productive of methylmercury than those with fine-grained, organic-rich substrates. In addition, recent CalFed reports¹⁸ identified the Yolo Bypass, Cosumnes River, and San Joaquin River floodplains as areas of high methylmercury production and bioaccumulation when they were flooded in the spring and summer of 2006. Staff recommends that future studies evaluate how much long-term bioaccumulation in small and large fish results from flood events and other frequent and infrequent point and nonpoint discharges. For example, storm water completely floods the Yolo

¹⁷ LWA. 1997. Sacramento River Mercury Control Planning Project. Final project report prepared for the Sacramento Regional County Sanitation District by Larry Walker Associates (LWA). March.

¹⁸ Stephenson, M., C. Foe, G.A. Gill, and K.H. Coale. 2008. Transport, Cycling, and Fate of Mercury and Methylmercury in the San Francisco Delta and Tributaries: An Integrated Mass Balance Assessment Approach. CALFED Mercury Project Final Report. Available at: <http://mercury.mlml.calstate.edu/reports/reports/>

Bypass about every other year for two months (Yolo Bypass Working Group, 2001); as a result, periodic flooding could play a substantial role in methylmercury production and bioaccumulation in the Yolo Bypass, highlighting the need to make reducing inorganic mercury sources to the Bypass a high priority (e.g., improving the Cache Creek Settling Basin). In contrast, extensive flooding along the San Joaquin River channel may happen much less frequently (e.g., when the Millerton and Pine Flat Reservoirs spill in the upper San Joaquin and Kings Rivers), such that it may be a higher priority for the San Joaquin River basin to evaluate natural processes and human activities that occur more frequently. Please also see Chapter 3 of the February 2010 TMDL Staff Report, which describes differences in methylmercury loads from various sources. Staff's recommendation for a study period is based on the premise that understanding the differences between individual methylmercury sources will lead to the development of effective methylmercury management practices that can be implemented in Phase 2.

R-76: It will be particularly important to identify effluent dominated waters or where a POTW or other individual point or nonpoint source is a significant portion of the mercury/methylmercury load to a particular receiving water within the Delta, Yolo Bypass or tributary watershed. Staff plans to evaluate which waterways within the Delta and its upstream watersheds are dominated by a particular individual source or source type during the proposed Phase 1 and will make the results of any such evaluations available for public review.

Furthermore, this proposed TMDL largely ignores its impact on many other, more pressing issues in the Delta and throughout the state that are being addressed by the Regional Board, the State Water Resources Control Board (State Board), other state agencies, and the governor-appointed Delta Vision Blue Ribbon Task Force – pelagic organism decline, recycled water, salinity control, flood control, drinking water policy, habitat loss – that are of significant importance.

R-77: As noted in an earlier response, the federal Clean Water Act requires that States list water bodies that do not meet water quality standards (i.e., are impaired) and develop programs to correct the impairment. Federal law does not give the State license to allow the methylmercury impairment to remain or worsen in trade for other environmental improvements. However, the Central Valley Water Board does have flexibility in deciding how the methylmercury reductions will be achieved. Staff agrees that there needs to be a balance between implementing controls to reduce methylmercury in Delta fish and addressing other pressing issues. For this reason, staff worked with stakeholders in a formal stakeholder process after the April 2008 hearing meeting to further develop a phased implementation approach that recognizes other pressing issues in the Delta and throughout the State. Under this proposed approach, the first phase of the control program would focus on:

- Conducting methylmercury studies;
- Implementing total mercury pollution prevention measures;
- Implementing improvements to the Cache Creek Settling Basin; and
- Identifying other high-priority legacy mercury reduction projects.

R-78: The proposed Phase 1 would occur over an eight-year period. During Phase 1, staff would develop mercury control programs for the upstream watersheds. At the end of Phase 1, the Board would review the study results and reassess the Delta TMDL allocations and compliance schedules. In Phase 2, implementation of methylmercury management practices would begin and legacy mercury reduction projects would continue.

R-79: USEPA scientists have supported the phased approach in written and oral comments (see USEPA comments ¹⁹ later in this document). Staff believes that there is a need to address mercury in the Delta now because the State Water Board and the San Francisco Bay and Central Valley Water Boards have declared the Delta to be a high priority and the local impacts of the mercury impairment are great (see #13 on page 35 of the USEPA comments). The Central Valley Water Board has committed to meeting its obligations to develop mercury TMDLs both within and upstream of the Delta in a timely manner. Delaying adoption of the Delta TMDL would delay methylmercury characterization and control studies that are needed for Delta and upstream control programs. Delaying the studies will postpone water quality improvements in the Delta. Of more concern, delaying the adoption of a Delta control program would be detrimental to stakeholders who depend on Delta fish for food.

R-80: Staff presented an option at the April 2008 hearing to modify the draft Basin Plan amendment to resolve these contrasting concerns. Staff worked with stakeholders to modify the implementation requirements in the February 2008 draft Basin Plan amendment such that Phase 2 of the control program would not begin until the Board has developed TMDL control programs for the major tributaries that input to the Delta and Yolo Bypass. This would address many of the Delta dischargers' concerns about balancing the implementation of methylmercury management practices with other pressing issues (e.g., pelagic organism decline, recycled water, salinity control, flood control, drinking water policy, and habitat loss). Under this approach, staff would develop control programs for the major tributaries during Phase 1 and have a more comprehensive plan for controlling within-Delta and tributary sources when staff returns to the Board after the Phase 1 methylmercury studies are completed.

Recommendations:

- **Focus on prudent total mercury reduction efforts to begin addressing impairments.**

R-81: Please refer to Board Staff responses to CVCWA comments earlier in this document that address the above comment [e.g., responses R-59, R-61 and R-71].

- **Stipulate that control studies need to consider holistically the competing Delta water quality and ecosystem issues and potential consequences (positive and negative) of any significant new treatment requirements on POTWs.**

R-82: The February 2010 draft BPA includes the following text to address this comment:

"Final reports for Control Studies shall include a description of methylmercury and/or inorganic (total) mercury management practices identified in Phase 1; an evaluation of the effectiveness, and costs, potential environmental effects, and overall feasibility of the control actions."
(page BPA-6)

"By [nine years after Effective Date] at a public hearing, and after a scientific peer review and public review process, the Regional Water Board shall review and reconsider, if appropriate, the Delta Mercury Control Program and may consider modification of objectives, allocations, implementation provisions and schedules, and the Final Compliance Date." (page BPA-8)

¹⁹ USEPA staff's April 2008 written comments are available at:
http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/staff_report_feb08/public_comments_feb08/usepa_23apr08_com.pdf

"The Regional Water Board shall assess: (a) the effectiveness, costs, potential environmental effects, and technical and economic feasibility of potential methylmercury control methods; (b) whether implementation of some control methods would have negative impacts on other project or activity benefits; (c) methods that can be employed to minimize or avoid potentially significant negative impacts to project or activity benefits that may result from control methods; (d) implementation plans and schedules proposed by the dischargers; and (e) whether methylmercury allocations can be attained." (page BPA-9)

R-83: Staff worked with stakeholders during the formal stakeholder process after the April 2008 hearing meeting to develop the above text to address stakeholder concerns regarding the balancing of methylmercury controls and other competing water quality and ecosystem issues. However, as noted in earlier responses [e.g., R-66], federal law does not give the State license to allow the methylmercury impairment to remain or worsen in trade for other environmental benefits. Somehow we must develop coordinated programs that address multiple impairments, protect all beneficial uses, and achieve environmental objectives. This is a daunting effort and is the reason staff recommended a phased approach to TMDL implementation in the February 2008 draft BPA and staff reports. This concern was further addressed by the formal stakeholder process after the April 2008 hearing meeting and the February 2010 draft BPA and staff reports, and should be further discussed during the ongoing stakeholder process as the proposed Phase 1 methylmercury control studies take place and the upstream control programs are developed.

R-84: Staff also worked with the NPDES Workgroup and MS4 representatives during the formal stakeholder process after the April 2008 hearing to develop methylmercury allocations and Phase 1 (interim) total mercury mass limits that are compatible with State and Regional Water Boards' and NPDES permittees' policies and goals for reclamation, water recycling programs, urban water reuse and other water conservation measures, and regionalization efforts to consolidate discharges.

2. Address the Majority of the Mercury Load to the Delta Prior to Implementing Phase 2 of this TMDL

R-85: Staff worked with CVCWA and other stakeholders during the formal stakeholder process after the April 2008 hearing meeting to develop the following text for the February 2010 draft Basin Plan amendments to address this comment:

"All dischargers should implement methylmercury management practices identified during Phase 1 that are reasonable and feasible. However, implementation of methylmercury management practices identified in Phase 1 is not required for the purposes of achieving methylmercury allocations until the Regional Water Board has completed the Phase 1 Delta Mercury Control Program Review and has developed the tributary mercury control programs."

R-86: Under this approach, staff would develop the upstream control programs during Phase 1 and have a more comprehensive plan for controlling tributary inputs of both total mercury and methylmercury to the Delta when staff returns to the Board after the Phase 1 methylmercury studies are completed.

R-87: Delaying Phase 2 implementation until upstream TMDLs are adopted would provide time for additional collaboration with public agencies and stakeholders to better integrate the Bay Delta Conservation Plan, Delta Vision, California Bay-Delta Program Ecosystem Restoration, the Delta Risk Management Strategy, FloodSAFE California, and other efforts with the implementation of the Delta mercury control program. Implementation of

pollution prevention measures for total mercury, Cache Creek Settling Basin improvements, and identification of other legacy mercury projects would still take place during Phase 1. Staff recommends that the Basin Plan amendment retain requirements for agencies and dischargers to implement actions to reduce human health risks while methylmercury control actions are evaluated during Phase 1. This will address the human health concern for stakeholders who consume mercury-laden fish from the Delta.

Page ES-5 states:

“Until the Phase 1 characterization and control studies have been completed, it is unknown whether the wetlands that act as substantial methylmercury sources in the Yolo Bypass also provide critical habitat to endemic species and whether it will be possible to avoid all potentially significant impacts.”

It is stated later in the closing statement that:

“The implementation of this proposed Basin Plan amendments will result in overall improvement in water quality in the waters of the Delta region and will have significant positive impacts to the environment and public health over the long term by enabling humans and wildlife to safely consume Delta fish.”

The former statement indicates that we are not sure if Phase 1 will discover significant negative impacts to critical habitat in wetlands, yet the latter statement confidently predicts only significant positive impacts will result from adopting this TMDL. Taking into account the uncertainty associated with attempting to control methylmercury through establishing load reduction allocations for ~25% of the methylmercury loads in the Delta (see pie chart below) and the ongoing critical ecosystem concerns in the Delta, the confident prediction of positive outcomes seems unreasonable and unsupportable.

R-88: To clarify, as noted on Pages ES-4 and ES-5 and explained in detail in Chapter 7 of the February 2008 draft BPA staff report, staff’s CEQA environmental impacts analysis determined that, with one exception, all potential impacts are expected to be limited and mitigated to less than significant levels, if not completely avoided, through careful project planning, design, and implementation. The above quote comes from the middle of the following paragraph on page ES-5 that describes the one exception:

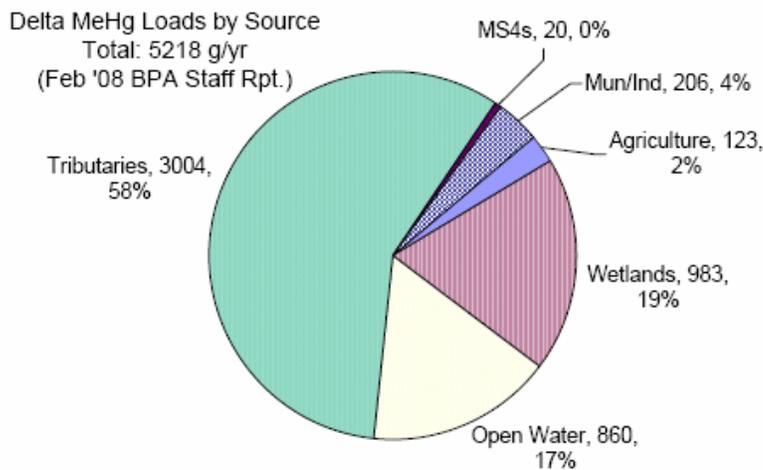
“The environmental analysis found that implementation of methylmercury management practices to achieve safe fish mercury levels in the Yolo Bypass has the potential to result in cumulatively considerable impacts to habitat that supports endemic species with limited geographic ranges, such as Sacramento splittail and Delta smelt. Until the Phase 1 characterization and control studies have been completed, it is unknown whether the wetlands that act as substantial methylmercury sources in the Yolo Bypass also provide critical habitat to endemic species and whether it will be possible to avoid all potentially significant impacts. However, the environmental analysis identified several methods to minimize negative effects on wetland function, including: implement only those onsite methylmercury management practices that do not change desirable wetland functions, focus implementation of management practices on wetland habitats that do not support endemic species with a limited geographic range, reduce upstream methylmercury sources and/or sources of mercury-contaminated sediment that supply the wetland sites, and, for new habitat restoration projects, locate new wetlands away from mercury contaminated watersheds.”

R-89: If there were no Delta mercury control program, the Delta fish tissue impairment would remain and likely worsen. Substantial population growth, extensive wetland restoration projects, and changes in water management practices are anticipated during the next twenty

years and could cause Delta fish mercury levels to increase, placing more humans and wildlife that consume Delta fish at risk.

R-90: As described in earlier Staff responses, the February 2010 draft Basin Plan amendments include more explicit language requiring that the Board evaluate the results of the Phase 1 studies, identify any potentially significant negative impacts to critical habitat before requiring the implementation of methylmercury controls, and consider modifying the methylmercury allocations and implementation strategy if significant negative impacts cannot be avoided. After the completion of Phase 1 studies, Board members will be better equipped to determine overriding considerations for competing beneficial uses. Until the Phase 1 studies are completed, we cannot know whether there are actually unavoidable conflicts between maintaining and restoring habitat function and reducing methylmercury concentrations in Delta fish.

Regulated dischargers, such as municipal wastewater, represent a small fraction of the overall Delta methylmercury budget. The following pie chart easily demonstrates the relative magnitudes of sources identified in the TMDL:



About half the wastewater treatment plants in the Central Valley (listed in Table C in the Basin Plan Amendment) discharge methylmercury above the proposed limit, thus if eventually that half is forced to reduce their loads by ~50%, then no more than 1% of the Delta methylmercury source load would be eliminated. Yet the TMDL leaves the impression that the studies and resulting controls would lead to attainment of the TMDL fish tissue objectives.

R-91: It was not staff's intent to imply that focusing only on in-Delta sources, or only on wastewater treatment plants, would resolve the Delta mercury impairment. As described earlier in Staff response R-73, point and nonpoint source discharges within the Delta/Yolo Bypass and tributary inputs are assigned an equal percent reduction by the allocations. To address CVCWA's concern, staff and stakeholders developed the draft BPA language included in Staff response R-85, which would not require implementation of methylmercury management practices identified in Phase 1 for the purposes of achieving methylmercury allocations until the Regional Water Board has completed the Phase 1 Delta Mercury Control Program Review and has developed the tributary mercury control programs.

R-92: To clarify, Table C in the draft BPA lists only the WWTPs in the tributary watersheds that discharge greater than 1 mgd.

R-93: Staff also addressed this concern in Staff responses to earlier CVCWA comments in this document, e.g. R-56, R-60, and R-73. Staff is open to evaluating the concept of regional wasteload allocations for NPDES discharges during the stakeholder process during Phase 1. Also, implementation of pilot offset projects and adoption of a long-term offset program would balance potential inequities in the cost of implementing controls to reduce NPDES methylmercury discharges (compared to the cost of implementing methylmercury management practices for nonpoint sources). The cost of methylmercury control methods identified by the Phase 1 control studies is one of the factors that the Central Valley Water Board is required to assess as part of the Phase 1 Program Review described on page BPA-9 of the February 2010 draft Basin plan amendments.

Focusing attention on minor sources, while over 75% of the total mercury and methylmercury sources (tributaries and open water) are not addressed, is misleading to decision makers and ultimately will be ineffective. The Regional Board should have a realistic plan for addressing the entire load of mercury to the Delta beyond simply allocating reductions to tributary watersheds.

R-94: Please refer to earlier responses that address this comment.

Recommendations:

- **State in the Executive Summary and in the Basin Plan Amendment that “we hope to see significant positive impacts...”, as there is no precedent established for the successful management and control of methylmercury in the environment.**

R-95: Staff edited the text in the February 2010 Executive Summary and draft BPA to attempt to address the intent of the above comment.

R-96: Precedent for methylmercury management was established locally when San Francisco Bay Water Board staff recently adopted a TMDL implementation plan for the Guadalupe River watershed that incorporates a methylmercury linkage and methylmercury allocations for reservoirs. The Santa Clara Valley Water District’s pilot project to reduce methylmercury in Lake Almaden in the Guadalupe Watershed has shown very positive results.²⁰

- **Commit the Regional Board in Phase 1 to conduct a Use Attainability Analysis to determine if the fish tissue objectives are reasonable and achievable. Adjust the fish tissue objectives accordingly.**

R-97: Staff edited the draft BPA language to more clearly address this commitment. Such an analysis will be possible once the Phase 1 studies are completed.

- **Commit the Regional Board in Phase 1 to develop an overall strategy for completing over 45 mercury TMDLs for multiple water bodies (based on the 2006 303(d) list for Region 5) and make significant progress in completing them.**

R-98: To address this concern, new text was added to the draft BPA that specifies dates during Phase 1 by which the Central Valley Water Board commits to developing mercury

²⁰ Drury, D. 2007. Santa Clara Valley Water District. Reduction of methyl mercury concentrations in an urban lake using a solar-powered circulator. Presentation at the 2007 Annual International Symposium of the North American Lake Management Society. October. <http://www.nalms.org/Conferences/Orlando/PDF/Orlando2007Program.pdf>

control programs for the major tributary inputs to the Delta (American, Cosumnes, Feather, Mokelumne Sacramento, and San Joaquin Rivers, and Marsh, Morrison and Putah Creeks).

3. Focus Mercury Control Requirements on Total Mercury until the Linkage Between Methylmercury Sources and Mercury in Fish Tissue is Better Characterized

A linkage analysis is the conceptual and quantitative connection between pollutant sources and the impairment(s) that the TMDL intends to protect. Federal regulations require that an adequate linkage analysis be included in any TMDL. The proposed TMDL includes onerous methylmercury concentration limits and load reduction requirements (with deadlines) that are built on a number of unsupported assumptions and unproven hypotheses. A verifiable linkage between the proposed control measures and actual reductions in fish tissue levels for mercury must be established to justify requiring so many onerous elements.

R-99: As described in detail in Chapter 5 of the February 2008 draft TMDL staff report, local and nationwide studies by scientific experts show that the concentration of methylmercury in water is the most important, single factor in determining how much methylmercury is in fish, and that the most direct way to reduce methylmercury in fish is to reduce the concentration of methylmercury in water. The Delta-specific mathematical relationship between methylmercury in water and methylmercury in fish indicates that the concentration of methylmercury in the water explains more than 90% of the methylmercury concentration in fish. This is a very significant statistical relationship.

R-100: USEPA staff and other scientists have reviewed the Delta-specific linkage analysis and supported the underlying hypothesis, data, analysis, and assumptions inherent in the linkage. As staff described during staff's April 2008 hearing presentation, recent data collected in the Delta by SRCSD, Dr. Darell Slotton, Dr. Chris Foe, and others underscores the linkage between methylmercury in water and fish. In addition, the Central Valley and San Francisco Bay Water Boards have incorporated similar methylmercury-based science in other TMDL control programs that were approved by the USEPA. Each of these supporting factors is summarized in separate bullets below.

R-101: USEPA staff concluded in their April 2008 comments²¹ (also included later in this document):

"We commend staff on their excellent analytical work. The source analyses for methylmercury and total mercury are well-developed and thorough. The numeric targets, which are the proposed fish tissue objectives, are reasonable and appropriate; they protect Delta anglers as well as threatened and endangered wildlife. The linkage analysis reflects exceptional, cutting-edge science. The TMDL and loading capacity analyses, and the load and wasteload allocations are reasonable. The Margin of Safety, Seasonal Variation and Critical Conditions analyses are appropriate. The TMDL document is thorough and sound; it reflects extraordinary work."

R-102: Dr. David Sedlak and Dr. Alex Horne, both Professors at UC Berkeley, provided independent peer review comments through the State Water Board peer review program. Dr. Sedlak researches mercury chemistry and factors affecting methylmercury levels. Dr. Horne

²¹ USEPA staff's April 2008 written comments are available at:
http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/staff_report_feb08/public_comments_feb08/usepa_23apr08_com.pdf

studies the measurement and treatment of pollutants, including mercury, in water. They received the June 2006 draft Basin Plan amendment staff report and Delta TMDL report with supporting data. They were specifically asked to review the linkage between methylmercury in water and fish, the mercury load calculations, and the potential effectiveness of the proposed control program in reducing mercury in fish. At the start of his response, Dr. Sedlak stated, *“Given the complexity of the problem and the difficulties associated with setting goals that are achievable, I believe that the staff members have used the available scientific data in a reasonable matter. Although I have some concerns about specific details, I have not found any major flaws that would call the scientific approach into question.”* Dr. Horne did not criticize the scientific basis of the linkage analysis, the evaluation of sources and loads of mercury and methylmercury, nor the basis of the proposed control program that reducing methylmercury in water and sediment will reduce methylmercury levels in fish.

R-103: Dr. Tom Grieb of Tetra Tech, Inc. was asked by the Delta Protection Commission to review the TMDL and proposed control program. Dr. Grieb highlighted uncertainties and sources of variation in the water to fish methylmercury linkage relationship. In the TMDL Report, methylmercury fish and water data from five subareas are plotted (Figure 5.2). An equation describing the best-fit line between all of these points (regression) is used to calculate a single aqueous methylmercury goal for the entire Delta. Dr. Grieb suggested an alternative approach, in which the fish and water data are used to develop five slightly different linkages specific to each subarea. Staff recognized in the June 2006 TMDL report that this alternative approach could be used, and found that it produces aqueous methylmercury goals for the Mokelumne, Sacramento, and San Joaquin River subareas that are lower (more stringent) than staff’s proposed aqueous methylmercury goal of 0.06 ng/L. Staff did not recommend the approach because we do not believe it is as statistically robust as the regression-based approach. (See Section 5.2 in Chapter 5 of the February 2010 TMDL Report.)

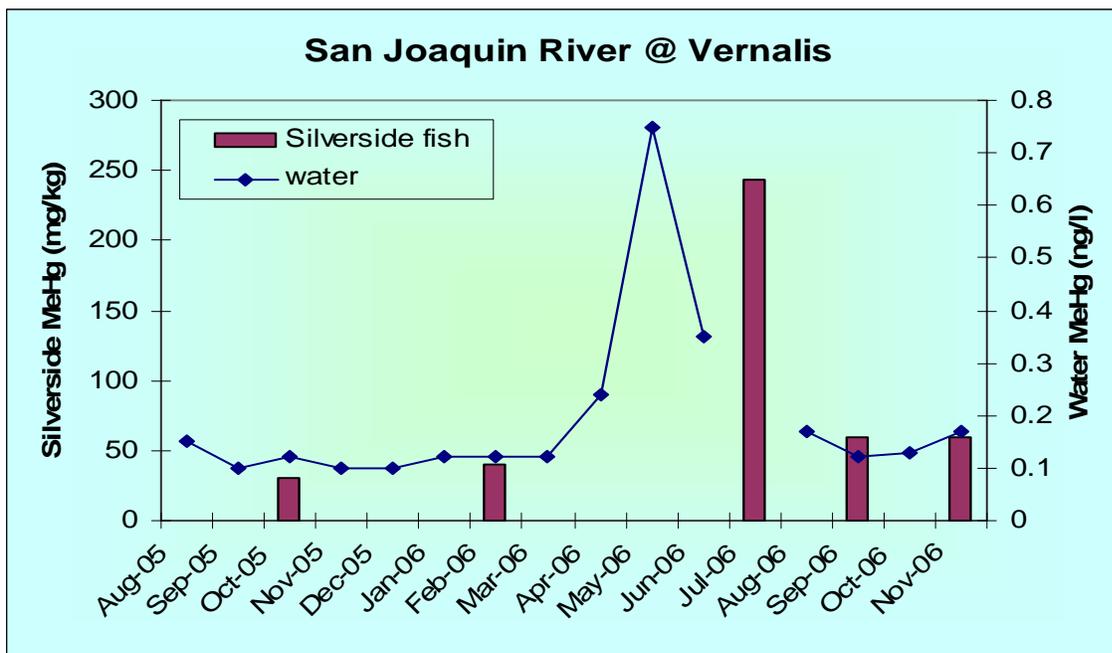
R-104: Recent data collected in the Delta underscores the linkage between methylmercury in water and fish.²² In its Localized Mercury Bioaccumulation Study,²³ SRCSD concluded that SRCSD WWTP effluent contributes about the same percentage of methylmercury to Sacramento River biota downstream of its discharge as it does to the methylmercury loading in the river. SRCSD found that four out of six fish and clams species sampled had methylmercury concentrations about 10% greater downstream from the discharge than upstream. The ratio of SRCSD WWTP methylmercury loads to river methylmercury loads was also about 10% during the study period. Recent CalFed data collected from the San Joaquin River also underscores the linkage. The below graph, which was presented during the April 2008 hearing, shows methylmercury concentration in small fish (bars) and in water (line) in the San Joaquin River at Vernalis. The fish data were collected by Dr. Darell Slotton and others

²² Slotton, D.G., S.M. Ayers, and R.D. Weyand. 2007. California Bay Delta Authority Biosentinel Mercury Monitoring Program. Second year draft data report covering sampling conducted February through December 2006. Available at http://www.sfei.org/cmr/fishmercury/2007_Annual_meeting/UC%20Davis%202006%20Biosentinel%20Draft%20Data%20Report.pdf

Stephenson, M., C. Foe, G.A. Gill, and K.H. Coale. 2008. Transport, Cycling, and Fate of Mercury and Methylmercury in the San Francisco Delta and Tributaries: An Integrated Mass Balance Assessment Approach. CALFED Mercury Project Final Report. Available at: <http://mercury.mlml.calstate.edu/reports/reports/>

²³ SRCSD. 2008. Localized Mercury Bioaccumulation Study. Final report prepared for Sacramento Regional County Sanitation District (SRCSD) by Larry Walker Associates in association with Applied Marine Sciences, Studio Geochimica, and University of California, Davis. March 2008.

from University of California, Davis and the water data were collected by Dr. Chris Foe and others at the Central Valley Water Board. In Fall 2005, fish and water concentrations were low. When floodplains of the San Joaquin River were inundated in Spring 2006, methylmercury concentrations in water increased about 8 times; two months later, concentrations in small fish increased. After the water methylmercury decreased, so did concentrations in small fish. The fish that Dr. Slotton measures are young and reflect changes in water conditions rather rapidly.



R-105: The Central Valley and San Francisco Bay Water Boards have incorporated similar methylmercury-based science in other TMDL control programs. The Central Valley Water Board adopted a methylmercury TMDL for the Cache Creek and its tributaries and the San Francisco Bay Water Board staff recently adopted a TMDL implementation plan for the Guadalupe River watershed that incorporates a methylmercury linkage and methylmercury allocations for reservoirs. The Santa Clara Valley Water District's pilot project to reduce methylmercury in Lake Almaden in the Guadalupe Watershed has shown very positive results.²⁴ In addition, the San Francisco Bay mercury control program requires San Francisco Bay dischargers to address methylmercury, in particular:

- NPDES dischargers, dredging projects, and wetland projects are required to monitor methylmercury and do methylmercury studies.
- Dredging and disposal operations are required to demonstrate that their activities do not increase the bioavailability of mercury.

²⁴ Drury, D. 2007. Santa Clara Valley Water District. Reduction of methyl mercury concentrations in an urban lake using a solar-powered circulator. Presentation at the 2007 Annual International Symposium of the North American Lake Management Society. October. <http://www.nalms.org/Conferences/Orlando/PDF/Orlando2007Program.pdf>

- Wetland restoration projects are required to be designed and operated to minimize methylmercury production and result in no net increase in mercury or methylmercury loads to San Francisco Bay.

R-106: Finally, the adaptive strategies outlined in both the February 2008 and February 2010 draft BPA allow the Delta control program and associated linkage and allocations to be modified as new scientific and management information becomes available. Implementation of methylmercury-specific controls for the purpose of achieving the proposed methylmercury allocations would not be required until the Central Valley Water Board has completed the Phase 1 Program Review.

One of CVCWA's primary concerns is that regulating methylmercury inputs into the Delta does NOT equate to removal of bioavailable mercury from the ecosystem. Tending towards equilibrium, reactive mercury de-methylated by a wastewater facility could re-methylate in the Delta; or conversely, methylmercury discharged by a wastewater facility could de-methylate in the Delta. It is important to recognize that methylmercury is naturally created and destroyed within the ecosystem by natural bacteria present in wetlands and in streambed sediments, and that *de minimus* point source reductions of methylmercury by POTWs or other discrete sources will not achieve the methylmercury fish tissue objectives proposed by this TMDL.

R-107: Staff responds separately below to the different topics encompassed by the above comment: the concept of equilibrium chemistry, the at-times non-conservative nature of methylmercury in ecosystems, and whether making point source reductions will achieve the proposed fish tissue objectives.

R-108: Equilibrium Chemistry. Some stakeholders have asked previously in meetings whether staff has considered the equilibrium chemistry of methylmercury. They suggested that the removal of methylmercury from water will cause existing total mercury to methylate and release methylmercury to the prior methylmercury concentration, thereby restoring equilibrium. These stakeholders suggested that removing methylmercury will therefore not reduce the methylmercury concentration due to equilibrium chemistry in the water column. Staff assumes that the above phrase, "Tending towards equilibrium," refers to this past discussion. Staff provides a review of how the concept of equilibrium chemistry is not applicable to methylmercury in the Delta because this crucial to the understanding of how we can reduce methylmercury levels in the Delta.

The release of methylmercury from sediment into overlying water is a chemical process, but in ambient waters including the Delta, it is highly unlikely that methylmercury concentrations in surficial sediment and overlying water ever reach equilibrium. Methylmercury chloride has a maximum solubility in water of 100 mg/l at 21 degrees Celsius. In comparison, methylmercury concentrations in samples collected from various sources and sites in the Delta have been less than 10 ng/l and are typically much less. Methylmercury concentrations in a wetland in the Everglades have reached 20 ng/l. Other methylmercury complexes in the environment may have slightly different solubilities than methylmercury chloride. Nevertheless, methylmercury concentrations in the Delta are orders of magnitude less than the levels needed to produce a saturated solution.

Also, the amount of methylmercury moving from sediment to overlying water is not controlled by the concentration of methylmercury in overlying water (as it would be in an equilibrium situation), but by the net amount of methylmercury in sediment pore water that is available to diffuse into overlying water. The net amount of methylmercury available for diffusion is the

amount of methylmercury produced in the sediment minus any removal of dissolved methylmercury from sediment pore water by bacterial demethylation and/or binding to particulates. Binding of methylmercury to organic matter or other particulates can be an equilibrium process, but is governed by the number of available binding sites, not on concentration of methylmercury in overlying water.

Bacterial methylation and demethylation are metabolic processes, which are also not governed by equilibrium chemistry. Methylmercury is a byproduct of the metabolism of sulfate-reducing bacteria. The amount of methylmercury produced is a function of the amount of active bacteria in sediment, their available food, available sulfide, and other factors that control bacterial activity (e.g., pH, oxygen state of sediment which controls the rate of bacterial respiration).

Here is an example of concentrations of something being controlled by a chemical equilibrium process versus a biologic process. The diffusion of a gas (e.g., oxygen) from the surface of water into air is a process governed by equilibrium chemistry. The rate of diffusion is a function of the concentrations in water and overlying air. In a given mass of air and water, when other conditions, such as temperature, are held constant, concentrations of oxygen in water and air will reach a steady state, which is equilibrium. If oxygen is removed from the mass of air after equilibrium is reached, more oxygen will move from water to air until a new steady state is reached. The process would be the same for diffusion of elemental mercury from water to air.

In contrast, the diffusion of carbon dioxide from your lungs to surrounding air is not governed by equilibrium chemistry. The amount of carbon dioxide in the surrounding air does not affect the rate that you exhale carbon dioxide. Rather, the amount of carbon dioxide that you exhale is governed by your respiratory rate, which is a function of your metabolic activity.

R-109: The Non-conservative Nature of Methylmercury. The Delta TMDL is based on empirical data, not on an assumption that methylmercury is always conservative. Staff recognized that the aqueous concentration of methylmercury at any site or time is the result of the interaction of multiple factors, including methylmercury production and degradation. Board staff and others have found that in some waterways, processes of methylmercury production and transport downstream in the water column are dominant and in others, processes that remove methylmercury from the water column are dominant. Clearly, methylmercury is not always acting in a conservative fashion.

In the Sacramento River, methylmercury appears to be relatively conservative. Concentrations of methylmercury increase with distance downstream in the Sacramento River. The sums of methylmercury loads in the Sacramento River at Colusa and loads from the major tributaries (Colusa Basin Drain, Feather River, and American River) closely match the loads in the Sacramento River downstream at Freeport (Stephenson *et al.*, 2008²⁵). Conversely, in the Central Delta, net methylmercury concentrations (resulting from the combination of source inputs plus loss processes) may be dominated by methylmercury removal from the water column. Concentrations of methylmercury are lower in the Central Delta, relative to the periphery and in tributaries. The removal of methylmercury from the water column is due to a combination of processes, primarily breakdown of methylmercury by light (photodegradation)

²⁵ Stephenson, M., C. Foe, G.A. Gill, and K.H. Coale. 2008. Transport, Cycling, and Fate of Mercury and Methylmercury in the San Francisco Delta and Tributaries: An Integrated Mass Balance Assessment Approach. CALFED Mercury Project Final Report. Available at: <http://mercury.mlml.calstate.edu/reports/reports/>

and attachment to particles and settling (Stephenson *et al.*, 2008). Breakdown of methylmercury by bacteria, and uptake into biota also likely contribute to methylmercury loss in the Delta. The Central Delta subarea is not considered impaired due to methylmercury.

Both the February 2008 and February 2010 draft Basin Plan amendments divide the Delta into subareas based on the hydrologic characteristics and mixing of source waters. By using existing methylmercury concentrations and water movement patterns when determining methylmercury allocations for the eight Delta subareas, staff has taken into account the different factors affecting methylmercury. A network of methylmercury measurements on the major tributaries as they entered the Delta and at locations within the Delta show how average methylmercury concentrations change as water moves across the system. The allocations for methylmercury sources in each subarea are based on conditions observed in each subarea from actual in-stream measurements and so incorporate non-conservative changes in methylmercury concentrations. Available data indicate that reducing loads of methylmercury to any subarea will result in lower concentrations of methylmercury in water and biota in that area.

For example, as described in an earlier response, in its Localized Mercury Bioaccumulation Study,²⁶ SRCSD concluded that SRCSD WWTP effluent contributes about the same percentage of methylmercury to Sacramento River biota downstream of its discharge as it does to the methylmercury loading in the river. There is no information that suggests that methylmercury discharged into a water body would disappear so rapidly that none of it would be accumulated, at least in part, into the food chain immediately downstream of the discharge. Also, as noted in a previous response, although natural fluctuations occur in methylmercury levels in the water column and fish in the Delta, methylmercury persists long enough in tributary and Delta waters to be reflected in fish uptake, with regional fish mercury patterns that stay consistent over years (e.g., Davis *et al.*, 2003 and 2008). Additional information about the persistence of methylmercury in the Delta, and processes that affect its production and degradation in the Delta, is provided in the February 2010 TMDL Report, and in Board staff's presentation, "Scientific Foundation for TMDL Development & Basin Planning" made during the 25 June 2009 stakeholder meeting.²⁷

Mercury is a regional problem because fish methylmercury levels throughout the Delta, the Yolo Bypass, and many of the tributary waterways are higher than is considered safe for human and wildlife consumption. This is because inorganic mercury and methylmercury sources are present throughout much of the region. However, fixing the problem will take local, waterway-specific solutions because each waterway has its own unique set of methylmercury and inorganic mercury sources. Staff developed a separate methylmercury allocation scheme for each hydrologic subarea of the Delta because the levels of impairment within, and the methylmercury sources that discharge to, each subarea are different.

R-110: Usefulness of Point Source Reductions. Staff recognized the importance of nonpoint sources such as sediments in wetlands and open-water habitats in the source

²⁶ SRCSD. 2008. Localized Mercury Bioaccumulation Study. Final report prepared for Sacramento Regional County Sanitation District (SRCSD) by Larry Walker Associates in association with Applied Marine Sciences, Studio Geochimica, and University of California, Davis. March 2008.

²⁷ The 25 June 2009 staff presentation, "Scientific Foundation for TMDL Development & Basin Planning", is available at:
http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/stakeholder_meetings/2009jun25/25jun09_tech_basis_pres.pdf

analyses and allocations described in the February 2008 draft staff reports. Indeed, TMDL programs are required when addressing point sources alone will not fix an impairment. Staff does not expect that reducing point sources alone will achieve the methylmercury fish tissue objectives proposed by in the February 2008 and February 2010 draft TMDL and BPA. However, without the completion of additional methylmercury control studies, and characterization of point and nonpoint sources in the tributary watersheds, it is very difficult to define which sources are “de minimus” or which are feasible or make sense to control. When discussing the importance of different sources, many stakeholders have focused on the amount of loading by source category and by individual discharge. However, staff recommends that additional factors be considered. Given how many individual discharges there are in each source category in the Delta, almost all of the individual discharges are small. And, although the tributary inputs are substantial, available information indicates that they also contain a similar distribution of individual discharges. As mentioned in an earlier response, as observed as early as 1997 in the Sacramento River Mercury Control Planning Project report prepared for SRCSD by Larry Walker Associates, “... mercury sources in the study area appear to be diffusely distributed without any significant “hotspots” ...” (LWA, 1997, page 31). Examples of small discharges include most wastewater treatment plants, individual farm fields, and wetlands where water flow is managed in discrete units. It is the sum of all of the individual discharges in the Delta and its tributary watersheds that impairs the Delta. Each of the individual discharges has its own intrinsic value and financial constraints. As a result, the significance of different methylmercury and total mercury sources could be defined by: (a) their load, (b) their distance from an impaired area, (c) how big of a reduction is needed to achieve safe fish mercury levels in a given impaired area, (d) whether they can be controlled, (e) whether they can be controlled without impacting habitat function, (f) the cost to control them, and (g) the resources available to the responsible parties to implement controls. It is conceivable that the control program will need to focus on just a few large projects in some watersheds, but many small projects in other watersheds, to achieve safe fish mercury levels throughout the Delta. As noted earlier, staff is open to evaluating the concept of regional wasteload allocations for NPDES discharges (e.g., by Delta subarea and/or by tributary watershed). This topic can continue to be discussed during the ongoing stakeholder process.

The staff report (pg. vii) illustrates this point, stating that “Exports [in Water Year 2002-2003] were only about 50% of inputs, indicating that the Delta acts as a net sink for methylmercury. Preliminary photodegradation study results for the Sacramento River near Rio Vista (Byington et al., 2005) suggest that methylmercury loss from photodegradation may account for more than 50% of the unknown loss rate.” If 50% of the methylmercury in the Delta is lost for unknown reasons, will minor reductions in point source loads to the Delta actually lower the remaining 50% suspected to be responsible for elevated methylmercury levels in fish, or will these reductions be overwhelmed for unknown reasons too? Shouldn't we figure out where 50% of the methylmercury is being lost before assuming WLAs will be effective?

R-111: Recent CalFed study results (Stephenson *et al.*, 2008) released since the April 2008 hearing meeting evaluated loss processes in the Central Delta in much more detail since the 2003 CalFed study results upon which the February 2008 draft staff reports were based. Several findings are relevant to the above comments. First, the loss of methylmercury loads in the Central Delta was found to be an inverse function of incoming Delta flow; smaller losses in loads were observed at higher flows. Second, two additional loss processes were evaluated: photo demethylation and sedimentation. Sedimentation and the associated loss of attached methyl mercury was the major removal process in winter, estimated to have removed 37% of the total incoming load in January but only 20% in August. In contrast, photo demethylation was the principal removal process in summer, estimated to have removed 53% of the incoming load

in August but only 5% in January. Third, a new error term was calculated from the difference of the sum of all identified sources and sinks. The new error term is about 8% of the sum of all methylmercury sources to the Delta. In comparison, the relative percent difference of duplicate laboratory measurements of the same field sample was 9%. The new error term is within the analytical precision of replicate laboratory measurements suggesting that perhaps all major Delta source, export, and sink terms have been quantified.

R-112: As noted earlier, the draft BPA divides the Delta into subareas based on the hydrologic characteristics and mixing of source waters. For example, the area of maximum photodegradation and sedimentation occurs primarily in the Central and West Delta subareas. The allocations for methylmercury sources in each subarea are based on conditions observed in each subarea from actual in-stream measurements and so incorporate non-conservative changes in methylmercury concentrations. Available data indicate that reducing loads of methylmercury to any subarea will result in lower concentrations of methylmercury in water and biota in that area. For example, in its Localized Mercury Bioaccumulation Study, SRCSD concluded that SRCSD WWTP effluent contributes about the same percentage of methylmercury to Sacramento River biota downstream of its discharge as it does to the methylmercury loading in the river. There is no information that suggests that methylmercury discharged into a water body would disappear so rapidly that none of it would be accumulated, at least in part, into the food chain immediately downstream of the discharge.

R-113: Finally, as discussed earlier in more detail, almost all of the individual point and nonpoint discharges in the Delta are small. And, although the tributary inputs are substantial, available information indicates that they also contain a similar distribution of individual discharges. It is the sum of all of the individual discharges in the Delta and its tributary watersheds that impairs the Delta. It is conceivable that control programs will need to focus on just a few large projects in some watersheds, but many small projects in other watersheds, to achieve safe fish mercury levels throughout the Delta and its tributary watersheds.

Another of CVCWA's primary concerns with this proposed TMDL centers on the significant scientific uncertainties surrounding the ability of the proposed implementation plan to achieve mercury objectives in fish tissue. These uncertainties should be clearly expressed in the Basin Plan Amendment, as should the uncertainty of most of the source characterizations and the unknowns in understanding methylmercury control mechanisms. All these uncertainties should be weighed in light of proposed stringent regulatory requirements and prohibitions. When setting new objectives and goals, sections 13241 and 13242 of the California Water Code requires a complete analysis of the feasibility of proposed implementation measures in relation to the attainment of target mercury levels in water and fish. This level of analysis is not provided in the current version of the proposed TMDL.

R-114: Staff sincerely attempted to express uncertainties in the February 2008 draft BPA and associated staff reports and to provide an evaluation of reasonably foreseeable methods of compliance and associated potential environmental effects, costs, ability to achieve the proposed fish tissue objectives, and overall feasibility of each alternative, in compliance with California Water Code and CEQA requirements as they relate to certified regulatory programs in the BPA staff report. The February 2008 draft BPA provides an adaptable framework to encompass uncertainties in the Delta source analysis and the need for additional tributary source analyses and control studies. This approach was further developed by the formal stakeholder process after the April 2008 hearing and the February 2010 draft Basin Plan amendments now contain more detailed language describing the adaptive management approach as well as more detailed requirements for the Board to conduct a Phase 1 Program

Review. The appropriate actions for individual dischargers to take during Phase 2 will vary depending on discharge-specific characteristics and the results of the control studies. The Central Valley Water Board has not required implementation of specific practices or technologies to comply with previously developed control programs and will not for the Delta mercury control program.

R-115: California Water Code Section 13241 identifies six factors that must be considered by a regional board in establishing a water quality objective: past, present, and future beneficial uses of water; environmental characteristics of the hydrographic unit; water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area; economic considerations; the need for new housing; and the need to develop and use recycled water. Section 13242 requires that an implementation plan for achieving the objectives contain: a description of the nature of the actions which are necessary to achieve the objectives; a time schedule for the actions to be taken; and surveillance to be conducted to determine compliance. The February 2008 and February 2010 draft BPA Staff Reports Parts 4.4.3 and 4.4.4 provide staff's evaluation of how the proposed water quality objectives will be met by the proposed implementation plan that assigns allocations to the upstream tributaries. The February 2010 draft BPA commits the Board to developing upstream control programs during Phase 1 and has an adaptive management commitment to implementing a long-term offset program and changing allocations if control of some methylmercury sources is not feasible.

CVCWA continues to work cooperatively with Regional Board staff to provide additional information and insight regarding methylmercury concentrations produced by different types of wastewater treatment facilities. CVCWA member agencies have already collaborated to study the results of the 13267 methylmercury monitoring that POTWs were required to perform. One of the fundamental conclusions of this study is that there are no known technological solutions for existing POTWs to reduce methylmercury concentrations to the levels in the proposed TMDL short of redesigning their treatment processes. Consequently, the unattainable WLAs in this proposed TMDL would divert limited resources from addressing other critical environmental protection issues, such as salinity control, etc., to constructing new treatment processes - and still not result in attainment of the fish tissue objectives.

R-116: There are four parts to staff's response to this comment. First, the waste load allocations for point sources may not be unattainable. As the authors alluded, and staff analyses of the 13267 data indicate (Bosworth *et al.*, 2010²⁸), some treatment processes currently result in effluent with very low and even non-detectable concentrations of methylmercury, and the treatment processes that effectively reduce methylmercury may also reduce other pollutants (e.g., ammonia and total mercury).

R-117: Second, as noted earlier, mercury minimization measures have the potential to reduce NPDES methylmercury discharges, possibly enough for some or even most facilities to achieve the proposed methylmercury allocations. For example, during the April 2008 hearing, SRCSD's District Engineer said that the SRCSD WWTP's effluent total mercury and

²⁸ Bosworth, D.H., S.J. Louie, M.L. Wood, D.J. Little, and H. Kulesza. 2010. A Review of Methylmercury Discharges from NPDES Facilities in California's Central Valley. California Regional Water Quality Control Board, Central Valley Region, Final Staff Report. March 2010. Available at: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/other_technical_reports/

methylmercury decreased as a result of influent total mercury decreases associated with the initiation of their “Be Mercury Free” source control program. Board staff’s calculations indicate that the SRCSD WWTP’s average annual methylmercury discharge during recent years (2005-2007, ~95 g/yr) comes very close to meeting staff’s proposed allocation for the SRCSD WWTP (89 g/yr). Also, upgrades to the City of Stockton WWTP completed in September 2006 to meet new ammonia effluent limits and Title 22 (or equivalent) tertiary requirements appear to have led to substantial reductions in total mercury and methylmercury as well as ammonia. A comparison of WWTP effluent ammonia, total mercury and methylmercury data collected before and after the treatment plant upgrades indicates that since the WWTP was upgraded, average effluent ammonia concentrations decreased by 95%, average inorganic mercury concentrations decreased by 83%, and average methylmercury concentrations decreased by 91%. (See Section 6.2.3.1 in Chapter 6 of the February 2010 TMDL Report for more discussion.)

R-118: Third, as noted in previous comments, staff does not expect that reducing just the point sources will achieve the proposed fish tissue objectives. Staff expects that a suite of control actions for a variety of large and small point and nonpoint sources will be required. This is reflected in the allocations proposed in both the February 2008 and February 2010 draft BPAs and explained in the draft staff reports.

R-119: Fourth, as noted earlier, the federal Clean Water Act requires that States list water bodies that do not meet water quality standards (i.e., are impaired) and develop programs to correct the impairment. Federal law does not give the State license to allow the methylmercury impairment to remain or worsen in trade for other environmental improvements. However, the Central Valley Water Board does have flexibility in deciding how the methylmercury reductions will be achieved. Staff agrees that there needs to be a balance between implementing controls to reduce methylmercury in Delta fish and addressing other pressing issues. For this reason, staff supports a phased implementation approach for the Delta mercury control program and the commitment in the draft BPA for the Central Valley Water Board to conduct a Phase 1 Program Review that would entail the consideration of new scientific information about methylmercury control methods’ effectiveness, costs, and potential environmental impacts, and the adjustment of the mercury control program (e.g., methylmercury allocations and compliance schedules) as needed.

The proposed Basin Plan Amendment presents essentially two separate TMDLs: total mercury and methylmercury. The proposed TMDL compels relatively minor sources to make reductions of methylmercury to implement potentially very expensive control measures for methylmercury, with little evidence that the control measures will actually result in significant net environmental benefit to the Delta. Until we develop a better understanding of how natural processes in water bodies transform total mercury to methylmercury, and vice-versa, CVCWA believes we should focus our efforts on controlling the known precursor to methylmercury in the Delta: total mercury.

R-120: Staff agrees that implementation actions should focus on reducing total mercury sources (e.g., during Phase 1 of the proposed control program) until additional methylmercury control studies have been completed. Also, as noted earlier, the draft Basin Plan amendments now contain language developed with stakeholder input after the April 2008 hearing meeting that specifically states that methylmercury implementation actions would not be required to comply with the allocations until Phase 2, and that Phase 2 will not begin until mercury control programs have been developed for the major tributaries to the Delta and Yolo Bypass and the Central Valley Water Board has completed the Phase 1 Program Review. Under this approach, staff would develop the upstream control programs during Phase 1 and have a more

comprehensive plan for controlling tributary inputs to the Delta when staff returns to the Board after the Phase 1 methylmercury studies are completed.

Recommendation:

- **Prior to adoption of this TMDL, establish a verifiable, peer-reviewed linkage analysis between proposed control measures and actual expected reductions of mercury in fish, and quantify the probability of achieving the TMDL objectives.**

R-121: As described earlier, local and nationwide studies by scientific experts show that the concentration of methylmercury in water is the most important, single factor in determining how much methylmercury is in fish, and that the most direct way to reduce methylmercury in fish is to reduce the concentration of methylmercury in water. The linkage analysis described in the February 2008 draft BPA staff report (see Chapter 5) establishes the link between methylmercury in Delta fish and methylmercury sources. The Delta-specific mathematical relationship between methylmercury in water and methylmercury in fish indicates that the concentration of methylmercury in the water explains more than 90% of the methylmercury concentration in fish. This is a very significant statistical relationship. The Delta methylmercury TMDL has been scientifically reviewed by two independent scientists through the State Water Board's formal peer review program (as required by the Porter Cologne Act) and by a mercury expert retained by the Delta Protection Commission. In addition, USEPA staff has reviewed the Delta-specific linkage analysis and supported the underlying hypothesis, data, analysis, and assumptions inherent in the linkage. As staff described during staff's April 2008 hearing presentation, recent data collected in the Delta by SRCSD, Dr. Darell Slotton, Dr. Chris Foe, and others underscores the linkage between methylmercury in water and fish. Please refer to the earlier responses for a detailed discussion about the peer review of the linkage analysis.

R-122: As described earlier, both the February 2008 and February 2010 BPAs divide the Delta into subareas based on the hydrologic characteristics and mixing of source waters. By using existing methylmercury concentrations and water movement patterns when determining methylmercury allocations for the eight Delta subareas, staff has taken into account the different factors affecting methylmercury. The allocations for methylmercury sources in each subarea are based on conditions observed in each subarea from actual in-stream measurements and so incorporate non-conservative changes in methylmercury concentrations. Available data indicate that reducing loads of methylmercury to any subarea will result in lower concentrations of methylmercury in water and biota in that area. This concept is supported by the results of SRCSD's recent Localized Mercury Bioaccumulation Study (see earlier response). SRCSD concluded that SRCSD WWTP effluent contributes about the same percentage of methylmercury to Sacramento River biota downstream of its discharge as it does to the methylmercury loading in the river.

R-123: As described in the TMDL Report, numerous studies have indicated that reducing mercury sources leads to reductions in fish mercury levels. Staff did not further quantify the probability of achieving the TMDL objectives. The adaptive management strategy that was further developed through the stakeholder process after the April 2008 hearing meeting will track the progress of the control program and make adjustments as necessary.

4. Support Rather than Discourage Mercury Offsets

At this time, CVCWA sees a fixed compliance date for WLAs yet no feasible means to comply with this deadline.

R-124: Individual waste load allocations and compliance schedules – including interim limits - are required for point sources by the Clean Water Act, USEPA requirements for TMDLs, and the State Water Board’s Policy for Compliance Schedules for NPDES Permits and the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (a.k.a. State Implementation Plan or SIP). Even so, the Central Valley Water Board does have flexibility in deciding how to implement the allocations. Because additional studies need to be conducted to evaluate methylmercury and total mercury control measures, staff proposed a control program with a phased approach that allows allocations and compliance schedules to be amended once additional studies are completed. During the stakeholder process, staff worked with stakeholders to develop Basin Plan amendment requirements that better balance flexibility with long-term certainty, and still have a control program that is scientifically defensible and complies with CWA/USEPA/State Water Board requirements, including assigning allocations and compliance schedules. For example, implementation of methylmercury control measures to comply with the proposed allocations would not be required until Phase 2, which would not begin until control programs have been developed for the major tributary inputs and the Central Valley Water Board has completed a Phase 1 Program Review.

Offset projects can provide financial incentives to accelerate mercury source load reductions at a lower cost to the public. For these reasons, CVCWA generally supports the concept of offset programs as an alternative compliance tool.

R-125: Staff agrees. The “Mercury Offsets” language in the draft Basin Plan amendments have been updated to reflect additional stakeholder input before and after the April 2008 hearing meeting, as documented in the February 2010 BPA Staff Report (see Sections 4.2.1 (Consideration #4) and 4.2.9). Additional explanation of staff’s rationale for the Phase 1 pilot offset project guidance criteria that were included in the February 2008 draft BPA report is provided in the document, “Staff’s Initial Responses to Board and Stakeholder Questions and Comments at the April 2008 Hearing”²⁹ (see item A-5, pages 23 through 28).

The Regional Board already mandated offset feasibility studies submitted by the Sacramento Regional County Sanitation District (SRCSD) in 2005 and by the City of Stockton in 2006. Relying now on the State Board to develop a mercury offset policy seems to disregard the several years of effort embodied in those studies.

R-126: Staff attempted to address this concern in the February 2008 draft BPA by including language in the “Pilot Mercury Offset Projects and Early Implementation of Total Mercury Reduction Efforts” section (pages BPA-13 through BPA-15) that would:

- Commit the Regional Water Board to considering the adoption of an offset program by the end of Phase 1 to allow dischargers to offset methylmercury and/or total mercury in their discharges by implementing more feasible or cost effective projects elsewhere in the watershed; and
- Outline guidance criteria for voluntary Phase 1 pilot offset projects.

R-127: Also, as noted earlier, the “Mercury Offsets” language in the draft Basin Plan amendments has been updated to reflect additional stakeholder input provided before and after the April 2008 hearing meeting, as documented in the February 2010 BPA Staff Report. In

²⁹ Available at: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/stakeholder_meetings/25nov08_hearing_rtc.pdf

particular, the draft BPA language strengthens the commitment for the Board to consider adoption of a mercury offsets program during Phase 1, regardless of whether the State Board develops an offset policy.

R-128: Because an offset policy may be required to achieve the goals of the Delta and San Francisco Bay mercury control programs, and more mercury TMDLs are underway throughout State that likely will have similar needs, a statewide policy is needed to ensure consistency and effectiveness. Any Regional Water Board offset program must be consistent with any State Water Board offset policy that is developed, regardless of whether the Regional Water Board's offset program was developed before or after the State Water Board's policy. Further, State Water Board Resolution No. 2005-0060 (page 4) states that the State Water Board:

“Directs State Water Board staff to develop a State policy for water quality control that establishes alternative methods to allow dischargers to meet mercury effluent limitations that are directed to preventing contributions to excursions above water quality standards.”

In addition, the San Francisco Bay Water Board Basin Plan amendment (adopted as Exhibit A of Resolution 2006-0052, page 26; underlining of key phrases added by Central Valley Water Board staff) states:

“Achievement of the wasteload allocations for municipal wastewater dischargers is required within 20 years, and interim allocations within 10 years. The interim allocations are expected to be attained through aggressive pollution prevention and other cost effective mercury reduction methods. The final wasteload allocations are expected to be attained through wastewater treatment system improvements and/or implementation of a pollutant offset program. Approximately 10 years after the effective date of the TMDL or any time thereafter, the Water Board will consider modifying the schedule for achievement of the wasteload allocations or revisions to wasteload allocations if:

- The State Board has not established a pollutant offset program that can be implemented within the 20 years required to achieve final wasteload allocations;*
- It can be demonstrated that all reasonable and feasible efforts have been taken to reduce mercury loads; and*
- It can be demonstrated that no adverse local effects will result.”*

R-129: During the Phase 1 Program Review, the Central Valley Water Board can consider modifying individual allocations and the schedule for achievement of the allocations if, by the end of Phase 1, the Central Valley Water Board is not able to develop an offset program for the Delta mercury control program and the State Water Board has not established a pollutant offset program that can be implemented in time to achieve final allocations by the proposed compliance date (e.g., 2030).

The proposed TMDL also contains provisions that would discourage rather than encourage offset projects. In discouraging the implementation of an offset program that will inevitably be necessary for dischargers to meet WLAs, the Regional Board is discouraging this compliance option. Without an offset program, many billions of dollars could be spent installing costly treatment facilities to remove relatively insignificant amounts of methylmercury from wastewater with only a minimal net environmental benefit to the Delta.

The Regional Board needs to appreciate that most of the offsets evaluation criteria and requirement in the TMDL (pages BPA-13 to 14) would discourage participation in what

should be a market-based incentive program. In particular, no responsible POTW is going to implement an offset project while knowing that (a) the Regional Board could subsequently enforce methylmercury allocations or set concentration limits that could potentially result in hundreds of millions of dollars in on-site controls, and (b) future TMDLs in tributary watersheds could allocate or otherwise mandate reductions by any identified offset projects.

Recommendation:

- **Rewrite the TMDL section on offsets to support offset opportunities, incorporating the extensive edits that will be provided by SRCSD.**

R-130: Staff supports the development of a fair and effective short-term pilot offset project policy and long-term offset program and appreciates the concern that “no responsible POTW is going to implement an offset project while knowing that (a) the Regional Board could subsequently enforce methylmercury allocations or set concentration limits that could potentially result in hundreds of millions of dollars in on-site controls, and (b) future TMDLs in tributary watersheds could allocate or otherwise mandate reductions by any identified offset projects.” It was for these reasons that staff proposed a phased approach to developing a Delta mercury control program (along with a long-term offset program), with a compliance date of 2030. Staff appreciates that it may not make sense for a discharger to commit to a long-term offset project until the upstream TMDLs have been completed and the Central Valley Water Board has re-evaluated the Delta methylmercury allocations and compliance schedules based on those TMDLs and additional control study results. For these reasons, staff worked with CVCWA and other stakeholders after the April 2008 hearing meeting to develop BPA language that would not require implementation of methylmercury controls to achieve the proposed allocations until after the Board has developed control programs for the major tributary inputs, considered the adoption of an offset program, and completed the Phase 1 Program Review.

R-131: Staff worked with CVCWA and other stakeholders to craft guiding principles for the development of Phase 1 pilot offset projects and a long-term offset program that would encourage the implementation of near-term projects to make near-term environmental improvements and generate useful scientific and policy data, as well as give dischargers credit that would enable more compliance flexibility. Additional methylmercury control studies need to be completed to determine which within-Delta and watershed sources have the most feasible and cost-effective control options that would make them suitable long-term offset projects and ensure that the fish tissue objectives are met in all areas of the Delta without impairing critical habitat in the Delta or its tributary watersheds.

R-132: Staff attempted to address the above concerns and other stakeholder concerns about how the Board should address offset projects in their April 2008 hearing presentation and in the follow-up document, “Staff’s Initial Responses to Board and Stakeholder Questions and Comments at the April 2008 Hearing” (see item A-5, pages 23 through 28). These concerns were further explored during the formal stakeholder process after the April 2008 hearing meeting and will continue to be explored during the Phase 1 stakeholder process. They are an example of the conceptual conflict documented by the Center for Collaborative Policy (CCP) Stakeholder Process Assessment,³⁰ the inherent conflict between the regulated communities’

³⁰ The Briefing Summary for the CCP Stakeholder Process Assessment is available at: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/stakeholder_meetings/19dec08_brfg_summ_handout.pdf

desire for a stable, predictable regulatory environment that offers consistent interpretation and enforcement over the long-term, while also seeking a flexible, non-prescriptive regulatory environment that accommodates variability and innovation.

R-133: CVCWA commented, “Without an offset program, many billions of dollars could be spent installing costly treatment facilities...” To clarify, a cost of billions is often quoted by dischargers because SRCSD has stated at stakeholder meetings and in written comments that it could cost SRCSD from \$1.3 billion dollars for microfiltration and UV to over \$3 billion dollars for reverse osmosis to reduce mercury in its discharge (for example, see SRCSD 24 April 2008 comments for the draft BPA Staff Report Appendix C). Microfiltration and reverse osmosis are the two most expensive options of the four advanced treatment options identified by Carollo Engineers for removing chlorpyrifos, diazinon, lindane, and mercury (see Carollo Engineers’ 2005 SRCSD Treatment Feasibility Study,³¹ Table 11). As discussed in the previous staff responses, it may be possible that treatments designed to reduce other pollutants could also reduce methylmercury. Board staff does not anticipate that SRCSD or any other discharger would need to implement microfiltration or reverse osmosis solely for the purpose of reducing effluent methylmercury levels. Also, advanced treatment may not be required to reduce effluent methylmercury levels. Not all secondary treatment facilities have elevated effluent methylmercury concentrations; for example, the San Jose/Santa Clara WWTP in the San Francisco Bay area makes use of a single-stage activated sludge process and has a secondary effluent methylmercury concentration of 0.04 ng/l.³² In addition, expensive upgrades to facility treatment processes may not be needed if aggressive pollutant minimization programs are implemented and maintained.

R-134: Also, the SRCSD Sacramento River WWTP is the largest NPDES-permitted municipal WWTP in the Delta source region. It discharged 160 mgd on average between 2001 and 2006, compared to 36 mgd from the City of Stockton WWTP, which is the second largest NPDES-permitted municipal WWTP in the Delta source region (Bosworth *et al.*, 2010, Table 16). [Note, it is not surprising that these are the two largest municipal WWTPs in the Delta source region because the most populous urban areas in the Sacramento and San Joaquin Basins (the Delta’s primary source region) – Sacramento in Sacramento County and Stockton in San Joaquin County – are adjacent to and within the Delta (TMDL Report, Figure 6.9; CDOF, 2007³³). SRCSD’s annual discharge volume (160 mgd for 2001-2006) and average annual methylmercury load (161 g/yr for 2001-2006) accounts for about 49% and 71% of all municipal WWTP discharge volume (326 mgd) and methylmercury (228 g/yr), respectively, in the Sacramento River and San Joaquin River watersheds downstream of major dams (Bosworth *et al.*, 2010, Tables 16, and 36). In addition, it makes use of secondary treatment processes (rather than advanced treatment processes). As a result, it is reasonable to expect that its cost estimate for implementing advanced treatment options greatly exceeds potential

³¹ Carollo Engineers. 2005. Sacramento Regional County Sanitation District, Sacramento Regional Wastewater Treatment Plant, NPDES Permit NO. CA 0077682 Provision E.6 Treatment Feasibility Studies, Final. Carollo Engineers. Walnut Creek, CA. March 2005.

³² SJ/SC. 2007. *San Jose/Santa Clara Water Pollution Control Plant Mercury Fate and Transport Study*. Environmental Services Department, SJ/SC Water Pollution Control Plant. San Jose, CA. March 2007.

³³ CDOF. 2007. New State Projections Show 25 Million More Californians by 2050; Hispanics to Be State’s Majority Ethnic Group by 2042. California Department of Finance (CDOF), Sacramento, California, July 2007. Table 1: County Total Population by Decade. (Updated since May 2004 publication.) Accessed: July 13, 2007. Available at: <http://www.dof.ca.gov/HTML/DEMOGRAP/ReportsPapers/Projections/P1/P1.asp>.

costs that could be associated with other facilities implementing advanced treatment or alternative options to comply with their allocations.

5. Promote Regional Monitoring Rather than Require Discharger-Specific Receiving Water Monitoring

The draft Basin Plan Amendment on page 6 requires that all POTWs in Tables B and C monitor for methylmercury and total mercury in their effluent and receiving water. The draft TMDL does not require monitoring from other minor sources. CVCWA believes that requiring individual POTWs to monitor receiving waters for a pollutant that presents a regional problem, without a comprehensive monitoring effort from all inputs, would not be productive. SRCSD has already conducted a very detailed scientific study tracking mercury in their receiving waters and found minimal localized effects.

R-135: Based on the results of SRCSD's recent Localized Mercury Bioaccumulation Study (see response R-133), SRCSD concluded that SRCSD WWTP effluent contributes about the same percentage of methylmercury to Sacramento River biota downstream of its discharge as it does to the methylmercury loading in the river. [Short-lived biota had methylmercury concentrations about 10% greater downstream from the discharge than upstream, and the ratio of SRCSD WWTP methylmercury loads to river methylmercury loads was also about 10% during the study period.] The Delta TMDL linkage analysis and more recent CalFed data collected from the San Joaquin River support SRCSD's finding. Staff does not recommend that POTWs conduct additional studies like that conducted by SRCSD.

R-136: The February 2010 draft Basin Plan amendments do not include requirements for NPDES dischargers (or nonpoint source dischargers) to monitor their receiving water. Requirements and recommendations are included for monitoring of all identified point sources and nonpoint sources.

The TMDL does not recognize the many current efforts to promote regional monitoring in the Sacramento and San Joaquin Rivers Watersheds and the Delta. For the Delta in particular, the recent Board Resolution R5-2007-0161 states:

“Many agencies and groups monitor water quality, water flows, and ecological conditions in the Bay-Delta, but there is no comprehensive contaminants monitoring assessment program. IEP, CALFED, and other organizations, including the Water Boards, conduct some of these analyses, but due to their specific mandates, information gaps may exist. Emerging concerns with contaminants related to the POD, wastewater treatment plant discharges, agricultural discharges, pesticides, blue-green algae toxicity, and unknown toxicity events all highlight the need to improve contaminants monitoring. A system is needed for coordinating among monitoring programs and integrating contaminants monitoring into existing monitoring efforts whereby all data is synthesized and assessed on a regular basis. An example of such a program is the San Francisco Bay Regional Monitoring Program (RMP).”

CVCWA is currently participating in Regional Board efforts to develop regional monitoring in the Delta and major tributaries. We believe it is appropriate in instances, such as this TMDL, where receiving water data throughout large waterbodies is needed to assess different sources or ecological effects, that monitoring be conducted through a well coordinated, regional monitoring program, rather than relying on individual efforts from a small sector of the potential sources.

What is needed now is to continue the regional efforts associated with biosentinel and sport fish monitoring at environmentally significant locations. Any monitoring

requirements in the TMDL should focus on beneficial use impairment, coordinate special studies, and encourage collaboration among various entities with diverse interests.

Recommendations:

- **Make any near-field receiving water monitoring by dischargers optional.**
- **Focus any receiving water monitoring requirements in the TMDL on beneficial use impairment**
- **Encourage collaboration with a regional monitoring program for the many diverse sources and source categories.**

We appreciate this opportunity to provide input into the Basin Planning process and look forward to working with you and your staff to resolve our concerns.

R-137: Staff agrees that a regional approach to monitoring receiving waters would be more productive than requiring all individual dischargers to conduct receiving water monitoring. Staff recommended at the April 2008 Board hearing meeting that the Board consider allowing dischargers to establish a regional monitoring program rather than requiring individual NPDES dischargers and irrigated agriculture and wetlands to do separate receiving water monitoring efforts. As noted in the document, “Staff’s Initial Responses to Board and Stakeholder Questions and Comments at the April 2008 Hearing” (see item 9, pages 32 and 33), Stakeholders and Board staff have been discussing a regional monitoring program for multiple water quality constituents. Staff will continue working with stakeholders to develop a coordinated monitoring plan for mercury, possibly through the broader monitoring program that is being considered for the Delta. Instead of entities monitoring their receiving water for methyl and total mercury individually, staff believes that a coordinated approach can be created that would minimize costs as well as meet the needs of the mercury control program for tracking sources and evaluating beneficial use impairments. As noted in the previous response, the February 2010 draft Basin Plan amendments do not include requirements for NPDES dischargers to monitor their receiving water.

6. Central Valley Flood Protection Board

Letter date: 9 April 2008

From: Jay Punia, Executive Officer, Central Valley Flood Protection Board

Thank you for the opportunity to review the Central Valley Regional Water Quality Control Board's (Water Board) draft Amendments to the Water Quality Control Plan for the Sacramento and San Joaquin River Basins for the Control of Methylmercury and Total Mercury in the Sacramento-San Joaquin Delta Estuary. While the Central Valley Flood Protection Board (Board) supports the Water Board's plan to reduce mercury pollution in the Delta, the Board is concerned with the basin plan amendments' proposed actions and requirements with regard to the flood system management in the Yolo Bypass and Cache Creek Settling Basin.

The Board believes that focusing control actions and cleanup of mercury-laden sediment in the Yolo Bypass and Cache Creek Settling Basin before controlling the upstream watershed sources of mercury may be premature. Without source control, mercury-laden sediments will continue to flow into the Bypass and Settling Basin making mercury-reduction efforts endless tasks with no guaranty of success. The Board therefore suggests that the Water Board completes its planned study to identify and evaluate potential mercury reduction projects in the upstream watersheds, particularly the Cache Creek and Putah Creek watersheds, before any characterization and control studies are initiated for the Bypass and Settling Basin. The Board also suggests that any control and cleanup actions be done only after projects to control mercury migration from these upstream sources are identified and implementation assured.

R-138: To address this concern, new text was added to the February 2010 draft Basin Plan amendments that specifies dates during Phase 1 by which the Central Valley Water Board commits to developing mercury control programs for the major tributary inputs to the Yolo Bypass and Delta (American, Cosumnes, Feather, Mokelumne Sacramento, and San Joaquin Rivers, and Marsh, Morrison and Putah Creeks).

R-139: Staff agrees that inactive mines that discharge to Cache Creek should be remediated. The Central Valley Water Board has already adopted TMDLs that require cleanup of the Sulphur Bank Mercury Mine at Clear Lake and fourteen mines in the Harley Gulch, Bear Creek, and Sulphur Creek watersheds. Cleanup requirements for mines in the Davis Creek watershed will be part of a future TMDL. In November 2007, the USEPA completed a removal action to control mercury transport from the most highly contaminated areas of the Abbott and Turkey Run Mines in Harley Gulch. The USEPA is also continuing remediation activities at Sulphur Bank Mercury Mine. The USBLM is evaluating cleanup options at two mines on its property in the Bear Creek watershed.

R-140: Along with the February 2010 deadlines for developing upstream TMDLs and the progress being made in controlling mercury from mine sites, staff believes improvements to the Cache Creek Settling Basin are justifiable. First, it will take time to identify responsible parties and develop and implement cleanup plans for other mines in the Cache Creek watershed. Second, inactive mines are not the only sources of mercury in Cache Creek. Staff recently completed an inventory of mercury in the Cache Creek Canyon.³⁴ Staff estimated that there are 2,200 kilograms of mercury in depositional zones in the 15-miles between Harley Gulch and

³⁴ Mercury Inventory in the Cache Creek Canyon. Central Valley Water Board staff report February 2008.

Bear Creek. While much of this mercury appears to have come from the mining districts in Davis Creek and Harley Gulch watersheds, some is naturally occurring (background levels of mercury are higher in Coast Range soils than in the Sierra Nevada and Sacramento River Basin). Third, the Cache Creek Settling Basin is effective at trapping mercury as well as sediment. While the costs and feasibility of removing mercury-contaminated sediment or implementing stringent erosion controls in the Cache Creek canyon have not been fully estimated, it is likely that maintaining the sediment-trapping efficiency of the Cache Creek Settling Basin would be more efficient and cost-effective.

This letter also serves to support the Department of Water Resources comments to the draft basin plan amendment, in particular, to the comments on the flood system management improvement proposals for the Yolo Bypass and the Cache Creek Settling Basin.

R-141: Please see Board Staff responses to DWR comments provided later in this document.

7. City of Woodland

Letter date: 23 April 2008

From: Greg Meyer, Deputy Director, Operations & Maintenance, City of Woodland

Thank you for providing the City of Woodland this opportunity to review and comment on the subject TMDL. The City supports the opinions expressed by the Central Valley Clean Water Association (CVCWA) in their April 9, 2008 comment letter to the Board. Specifically, CVCWA requests that the Regional Board:

- 1) Use a different approach for management of methylmercury
- 2) Address the majority of mercury load to the Delta prior to implementing Phase 2 of this TMDL
- 3) Focus mercury control requirements on total mercury until the linkage between methylmercury sources and mercury in fish tissue is better characterized
- 4) Support rather than discourage mercury offsets
- 5) Promote regional monitoring rather than require discharger-specific receiving water Monitoring

R-142: Please see Board Staff responses to CVCWA's comments earlier in this document.

The City of Woodland would like to bring to the Board's attention specific aspects of the proposed Basin Plan Amendment (BPA) that would likely have an adverse impact on the City's ability to comply with the methylmercury limits:

As described in table B of the Proposed Basin Plan Amendment (BPA), the City of Woodland has measured methylmercury levels at or near the testing detection limit. As a result it has been given the lowest Phase 1 concentration limit of 0.06 ng/L and a mass limit of 0.4 g/yr. While the calculations are not provided in the BPA, it appears the Board used an effluent of about 5.5 mgd to determine the waste load allocation. The City's effluent flows are already above this level, so the City should be out of compliance if adopted in its current form. The TMDL for total mercury in the City's current permit was calculated using maximum flows which allows the City's ability to address mercury reduction options as the City grows. The City of Woodland requests both mercury TMDL's be applied consistently in the City's current permit using maximum flows instead of average flows.

R-143: The February 2010 draft Basin Plan amendments do not include Phase I concentration limits (a change since the February 2008 version of the amendments). In the February 2010 TMDL Report, staff used the City of Woodland WWTP's average daily discharge for Water Year 2005 (6.05 mgd) and average concentration of methylmercury in effluent (0.03 ng/L) to estimate its annual methylmercury load (see Table 6.5 in the 2010 TMDL Report). Because the WWTP's effluent has a very low average methylmercury concentration, it is considered dilution (compared to the goal of 0.06 ng/l methylmercury for ambient Delta [receiving] water). As a result, its allocation allows an increase in methylmercury load to address anticipated population growth. The February 2010 draft Basin Plan amendments include a methylmercury load allocation for the City of Woodland based on a methylmercury concentration of 0.03 ng/l methylmercury and the WWTP's design daily average effluent flow capacity, 10.4 mgd, as defined in the recently adopted Order No. R5-2009-0010, rather than the

WY2005 discharge volume. Incorporating expected growth in the allocation acknowledges good performance of the low methylmercury dischargers. This approach is consistent with State Water Board Resolution No. 2005-0060, which required the San Francisco Bay Water Board to incorporate provisions that acknowledge the efforts of those point sources whose effluent quality demonstrates good performance, and require improvement by other dischargers, when establishing waste load allocations.

R-144: The allocation for the City of Woodland WWTP in the February 2008 draft Basin Plan amendments was based on the assumption that the WY2005 discharge [6.05 mgd] would increase by 60% to 9.7 mgd in response to future population growth, an assumption that was used for all facilities in the Delta and Yolo Bypass with very low effluent methylmercury concentrations.³⁵ The Central Valley Water Board recently adopted new waste discharge requirements for the City of Woodland WWTP (Order No. R5-2009-0010) that allow it to increase its design daily average effluent flow capacity from 7.8 mgd to 10.4 mgd. As a result, staff used 10.4 mgd, rather than 160% of the WY2005 effluent flow (9.7 mgd), to calculate the allocation for the City of Woodland WWTP in the February 2010 draft Basin Plan amendments. The allocation calculation methods are described in Chapter 8, Section 8.1.3, of the February 2010 TMDL Report.

R-145: Once the draft Basin Plan amendments are adopted by the Central Valley Water Board and approved by the USEPA, the waste discharge requirements for all of the NPDES permits for dischargers in the Delta and Yolo Bypass will be updated to reflect the requirements in the Basin Plan amendments, including the interim total mercury mass limits and methylmercury allocations defined by the amendments. Beginning in Phase 2 of the Delta Mercury Control Program (about 2020), the Central Valley Water Board would, as necessary, include schedules of compliance in NPDES permits for compliance with water quality-based effluent limits based on the methylmercury waste load allocations.

The draft BPA requests minimum reporting levels for methylmercury at 0.5 ng/L. The City's effluent measures are typically at or slightly above the method detection limit (MDL) of 0.2 ng/L. Considering the 0.06 ng/L standard, the City would be held to and would report and measures above 0.02 ng/L MDL.

R-146: As noted earlier, the February 2010 draft amendments do not include Phase 1 concentration limits. The typical method reporting level (ML) and method detection limit (MDL) for methylmercury are 0.05 ng/L and 0.02 ng/l, respectfully. In contrast, the typical ML and MDL for total mercury are 0.5 ng/L and 0.2 ng/l, respectfully. The minimum reporting levels are equivalent to the lowest calibration standards for methylmercury and total mercury, 0.05 and 0.5 ng/l at a minimum, respectively. The February 2008 draft Basin Plan amendments specified

³⁵ The California Department of Finance predicts that populations in the Delta/Yolo Bypass counties will increase 76% to 213% by 2050, with an average increase of about 120%. (CDOF. 2007. New State Projections Show 25 Million More Californians by 2050; Hispanics to Be State's Majority Ethnic Group by 2042. California Department of Finance (CDOF), Sacramento, California, July 2007. Table 1: County Total Population by Decade. (Updated since May 2004 publication.)) Staff assumed that, in general, NPDES-permitted WWTP discharges throughout the Delta/Yolo Bypass would increase by 120%. Staff assumed that half of that growth will be addressed by expansions to existing facilities in each Delta subarea, and that the remaining half will be serviced by new facilities in each subarea. Table 8.3 in Chapter 8 of the February 2008 draft TMDL report illustrates current WWTP effluent volumes discharged to each Delta subarea, the amount of discharge volume increase expected in each subarea, and the discharge volume that staff assumed will be addressed by existing and new facilities.

MLs and MDLs for methylmercury and total mercury; the February 2010 draft Basin Plan amendments no longer contains specifications for MDLs and MLs. The City's reported methylmercury discharge concentrations average 0.03 ng/L with a range of non-detectable to 0.059 ng/L. This average concentration was used to calculate the methylmercury allocation included in the February 2010 draft Basin Plan amendments. One half of the detection limit was used for effluent samples with non-detectable methylmercury concentrations to calculate the average concentration. Order No. R5-2009-0010 currently contains a total mercury mass loading limitation and states, "In calculating compliance, the Discharger shall count all non-detect measures at one-half of the detection level. If compliance with the effluent limitation is not attained due to the non-detect contribution, the Discharger shall improve and implement available analytical capabilities and compliance shall be evaluated with consideration of the detection limits." Staff expects that similar, reasonable options will be incorporated in the evaluation of compliance with the methylmercury allocations after the final compliance date, which is 2030 in the draft Basin Plan amendments.

Finally, the City is considering utilizing more "green technologies" for use and production of electricity at the WWTP. The facility is at a size that it could incorporate an anaerobic process and utilize biogas for the production of electricity. The concept is utilized by several POTW's included in the survey. It is believed that the POTW's utilizing anaerobic processes produce higher methylmercury levels than those that use strictly aerobic processes used by the City of Woodland. The City has concerns that the low limits in place would, in effect restrict the City utilizing more energy efficient systems in the future.

R-147: Determining the effects of anaerobic and other treatment processes on WWTP effluent methylmercury concentrations is a goal of the proposed Phase 1 methylmercury control studies. Staff will work with the City of Woodland, CVCWA, and other stakeholders to evaluate results of the studies and to understand benefits of the various treatments. The City of Woodland should play an active role the development of the Phase 1 methylmercury control studies to ensure the studies evaluate the effects of utilizing "green technologies" on effluent methylmercury levels. The Central Valley Water Board would like to promote energy efficiency and "green" technology as much as possible while maintaining water quality. The February 2010 draft Basin Plan amendments include requirements for a Phase 1 Program Review in about 2018-2019. As part of the Program Review, the Board would consider: modification of the methylmercury allocations and/or their final compliance date; schedules for methylmercury controls; and adoption of a Mercury Offset Program for dischargers who cannot meet their load and waste load allocations after implementing all reasonable load reduction strategies and can demonstrate no disproportionate impacts on local communities as a result. As stated in the draft amendments, the Board would also consider other potential public and environmental benefits and negative impacts of attaining the allocations. All of these considerations would factor into the review and possible revision of the allocations contained in the draft amendments.

8. Clean Water Action, Environmental Justice Coalition for Water, and BayKeeper

Letter date: 21 April 2008

From: Andria Ventura, Clean Water Action
Debbie Davis, Environmental Justice Coalition for Water
Sejal Choksi, Baykeeper

Clean Water Action, Baykeeper, and the Environmental Justice Coalition for Water, on behalf of our tens of thousands of California members, thank the Central Valley Regional Board for this opportunity to provide comments on the current version of the proposed methylmercury Basin Plan Amendment (BPA)/TMDL for the Delta. It is evident to us that the Regional Board Staff has exerted a great deal of energy and hard work in developing this plan. For instance, the TMDL Report is thoroughly researched, peer reviewed, and contains a well-considered and sophisticated analysis of mercury sources and fate within each of the Delta subareas. However, while we support a number of the aspects of this TMDL, we also have serious concerns. We offer the following comments and suggestions in the spirit of ensuring that we have the most comprehensive strategies and processes in place to truly address the mercury problem and protect our communities.

Our comments are based on our deep concern with the impacts of mercury, from both historical and contemporary sources, on wildlife and the environment as a whole, and the communities that depend on the Delta for a variety of benefits. Key among these benefits is fishing and our grassroots experience demonstrates that people in the region fish both for recreation and for basic subsistence as a result of cultural practices or economic need. We support these communities' fundamental right to fish and consume their catch, without risking their families' health and safety because of contamination. While we recognize that addressing the mercury problem in the Delta is complex, we believe that it is the responsibility of the Board to ensure that we do all we can to reduce methylmercury in the watershed in as rapid and complete a manner as possible. There is no longer any assimilative capacity for mercury and we must therefore seek to reduce levels at every opportunity.

Focus on Methylmercury—Protecting Subsistence Fishing Communities and Wildlife

We cannot overstate the importance of reducing methylmercury levels in order to protect the next generation of subsistence fishers, and we strongly support Staff's decision to focus on the bioaccumulative form of mercury in this TMDL. The plan does appropriately require that inorganic mercury is ultimately addressed as it can, given the correct circumstances, methylate and become bioaccumulative. However, sufficiently reducing total mercury (inorganic and methylmercury) loads in the Delta will take many decades, while human subsistence fishers, as well as fish dependent wildlife are at risk now from mercury contamination. Consequently, actions to limit the amount of mercury being accumulated in fish tissue and moving up the food chain will be essential in protecting both wildlife and humans from exposure. While there is still much to be learned about methylation, research in this area is encouraging and pilot programs in other watersheds are showing positive initial results.¹ [Footnote 1: An example of such a pilot program would be that done by the Santa Clara Valley Water District related to methylmercury loads in local reservoirs in the Guadalupe River watershed.] Similar programs can and should be incorporated into the Delta TMDL as a means of reducing methylmercury loads and refining understanding of the methylation process.

Recommendation: We strongly recommend that the Board reject any proposal to renege on all of the work done to date to create this BPA as a methylmercury TMDL

and to revise it to be a total mercury TMDL instead. We staunchly support the methylmercury focus of this TMDL and the recommendation to develop load allocations for both total mercury and methylmercury in the Delta as a means of protecting fishing communities in as expedient a manner as possible.

R-148: Staff believes that addressing sources of methylmercury as well as inorganic mercury will lower methylmercury levels in fish more quickly than focusing only on inorganic mercury. Staff will continue to support this position through further discussions of the mercury TMDL program with stakeholders.

Fish Tissue Target—Not Protective of Subsistence Fishers

The purpose of the TMDL is to remediate the Delta in order to regain and protect its beneficial uses. The Clean Water Act does not condone only protecting a portion of these beneficial uses or only part of the population that takes advantage of them. Instead, the goal is to protect all populations that depend on a clean safe environment.

The staff recommendation to adopt of a fish tissue objective based on consumption of 32 grams/day (one meal a week) is not valid because it is based on averages taken over a large population and ignores the significance of variations of fish consumption within that population. While it is difficult to provide an exact number of subsistence fishers, or those who eat much more than one meal a week, our organizations work with populations with close cultural ties to fishing, and/or are disadvantaged and depend on fishing to provide nutritious food for their families. In addition, the Department of Public Health has interacted with a broad range of community groups who work with populations consuming high amounts of Delta caught fish. Given this reality, the BPA and TMDL need to consider the ethnic distribution of among the region's fishers, the cultural and economic motivations for subsistence fishing, the disproportional risk born by disadvantaged communities and vulnerable populations such as children and pregnant women, disparities in community health and healthcare, and the ultimate impacts that such health disparities have on the quality of life and economic prospects of disadvantaged communities. It is not acceptable, or defensible to set goals and implementation requirements that will not ensure, albeit over time, that the watershed will be restored for the benefit of *all* our communities.

Staff's Alternative 5, which is in line with the US Environmental Protection Agency's recommendation of a rate of 142.4 grams/day, would allow 4 to 5 meals a week of Delta fish. This is closer to actual fishing practices in many of the region's communities, and thus a far more appropriate fish tissue target for this TMDL. Furthermore, we disagree with Staff 's reasoning that a more protective goal "may not be achievable or reliably measured..." (BPA p. 23). Method detection limits for mercury have been lowered repeatedly over recent years, and they will no doubt continue to decrease over the 24-year period recommended for TMDL implementation. Most importantly, if the more protective fish tissue objective cannot be achieved now, but is most appropriate for the protection of public health, then it should be adopted with the express purpose of promoting the maximum reductions in methylmercury and thereby improving health outcomes as much as possible.

Recommendation: The BPA should adopt a fish tissue objective that is protective of subsistence fishers and their families (Alternative 5). Furthermore, the proposed surveillance and monitoring program (BPA P. 18, BPA Report Section 4.3.4, p. 68) should tie the selection of monitoring locations as closely as possible to areas of subsistence fishing.² [Footnote 2: The CALFED Fish Mercury Project is a model for community involvement in monitoring]. [Footnote 2: CalFed's Fish Mercury Project, which has been providing essential information on mercury concentrations in fish in the Bay-Delta region, also provides a model for community involvement in deciding

where monitoring should occur and what species are key in order to protect public health.]

R-149: Staff recognizes that there are people who eat more than one meal per week of Delta fish. Staff recommends that Delta fish tissue objectives be based on people eating eight ounces (one meal) of a mix of trophic level 3 (e.g., bluegill, carp, crayfish, and salmon) and trophic level 4 (e.g., sturgeon, bass, and catfish) fish. If people eat mainly Delta fish species with low levels of methylmercury, they can safely eat more than one meal per week. The proposed fish tissue objectives are based levels necessary to protect sensitive groups of pregnant and nursing women and young children. In its fish consumption advisories, the State Office of Environmental Health Hazard Assessment (OEHHA) advises that non-sensitive groups (women not nursing, pregnant, or intending to become pregnant and men) can safely eat about three times more fish than sensitive groups.

R-150: Staff evaluated multiple consumption scenarios in the Delta mercury TMDL report and provided four consumption rate alternatives for the Board to consider in the Basin Plan Amendment staff report. Staff agrees that the water quality objectives should be as protective as possible. The USEPA requires that staff show that the TMDL has a “reasonable assurance” of being achieved. Staff believes that the water quality objective based on the USEPA 32 g/day of trophic level 3 and 4 fish will be met but that lower objectives may not be reached. First, the aqueous methylmercury goal (0.06 ng/L) that corresponds to the proposed water quality objective (0.24 mg/kg in trophic level 4 fish) is near the limit of detection for USEPA’s standard method. While larger volumes of water could be processed in order to detect concentrations of methylmercury lower than the aqueous goal, results may be uncertain and the time and cost for monitoring would be increased.

R-151: Second, staff considered possible Delta fish tissue objectives with respect to a survey of mercury concentrations in fish from 626 sites in 12 western states, including areas not affected by mercury and gold mining (Environmental Science and Technology 2007, vol 41 pg 58-65). Mercury levels in piscivorous fish (mainly trophic level 4) exceeded 0.24 mg/kg in 70% of the stream and river lengths surveyed; levels exceeded 0.05 mg/kg in all stream and river lengths tested. These data suggest that an objective of 0.05 mg/kg, which corresponds to 4-5 fish meals per week, likely would not be achieved in the Delta because it is not observed even in pristine streams. Atmospheric deposition of mercury from the global pool and natural background concentrations of mercury in soil produce a base level of mercury in fish. Because the Delta’s exact baseline is uncertain, staff recommends setting a water quality objective that has evidence of being achieved while allowing a significant level of consumption. While Phase 1 methylmercury studies are being conducted and methylmercury controls are implemented, consumers can safely eat more than one meal per week of Delta fish by following OEHHA’s fish consumption advisories for the Delta. OEHHA identified some fish and shellfish that may safely be eaten at three servings per week. A goal of the TMDL is to reduce methylmercury levels so that the fish that are now highest in mercury may be safely eating at least once per week.

R-152: Staff appreciates the suggestion to involve fishers from multiple communities in selection of monitoring sites and species. Staff participated in meetings of the CALFED Fish Mercury Project’s Local Stakeholder Advisory Group during development of the Basin Plan Amendment. Staff will continue to encourage involvement of community-based organizations and fishers in the development and implementation of the mercury plan, including monitoring and the Exposure Reduction Program.

Eight Year Study Period-Delays Known Opportunities to Reduce Loads

The BPA proposes two phases for implementation: 8 years of more study (Phase I), followed by 15 years of program implementation (Phase II). While we recognize the complexity of methylmercury control and the time involved with fully addressing 150 years of mercury pollution, such an implementation strategy does not in turn recognize the urgent need to begin reducing levels as our population continues to grow and our fishing communities are impacted. Instead, it seems to lean on scientific inquiry as a handy rationale for delaying needed action, rather than a genuine adaptive management approach, which would start methylmercury-control actions now based on the best available existing knowledge, and use the early results of those actions as the best guide to improving the control plan.

While some best management practices are expected to be implemented in the first 8 years to reduce mercury levels, there are no quantitative goals for specific sources to meet. It is therefore unclear to us how the effectiveness of such practices will be measured or how we will ensure that they are being implemented fully, if at all. More importantly, it is unclear on what Staff is basing the assumption that in 8 years we will have gained significantly more knowledge to establish specific actions, especially when the TMDL is already the result of years of study and analysis.

We do not support a phased approach that delays implementation and does not require measurable reductions in methyl and inorganic mercury over the next 8 years. The reality is that we will never know everything about mercury, methylation, or even the Delta itself. However, we do need to move forward as expeditiously as our knowledge at any given point will allow and there needs to be established, numeric goals to measure our progress, hold dischargers accountable, and ensure that all sources of both methyl and inorganic mercury are reducing their loads.

R-153: Staff agrees that implementation should not be delayed, but believes that the methylmercury control studies are needed for an effective program. Previous methylmercury studies (such as under the CALFED Program) allowed staff to identify source categories and estimate methylmercury and total mercury loads. We learned that some wetlands produce large amounts of methylmercury while others do not. Also, some wastewater treatment plants discharge high concentrations of methylmercury and others discharge very little. More studies are needed to identify the particular characteristics of low-methylmercury wetlands, treatment facilities and other discharges and determine whether these design or management features can be applied elsewhere to control methylmercury. Staff proposes that this next set of studies be done during Phase 1. Based on comments from stakeholders that would be required to complete the studies, staff proposed an eight-year period for obtaining funding, designing studies (including scientific review of designs), completion of studies, and review of results.

R-154: Staff's intent is to allow adequate time for effective studies, but not to allow studies to unnecessarily delay improvements if management practices become obvious. The proposed Basin Plan amendments state that during Phase 1, all dischargers should implement methylmercury management measures that are reasonable and feasible.

R-155: Staff proposes numeric requirements for mercury control for NPDES facilities that must be implemented during Phase 1. Urban storm water systems must also control mercury discharges in Phase 1 by implementing best management practices and the MS4s' Board-approved pollution prevention plans. The proposed Basin Plan amendments direct NPDES facilities to implement mercury minimization plan. NPDES facilities must report to the Board annually all mercury monitoring results, a summary of actions taken during the previous year pursuant to the minimization plan, and actions planned for the following year. It is true that

proposed mercury reductions by urban runoff systems (MS4) rely on implementation of best management practices and have no quantitative limits.

R-156: Staff agrees that the Delta methylmercury control program should incorporate adaptive management. As the first step in adaptive management, staff and the Board will review the entire program at the end of Phase 1, about 8 years. Other mercury TMDLs have a 5-year review cycle. Because the Phase 1 studies will provide significant, new information about useful methylmercury controls and possible revisions to the methylmercury allocations, staff believes a slightly longer time before the first full review of the program is acceptable.

Staff does identify a number of control actions that can and should be incorporated into the TMDL for immediate implementation instead of delaying until 2016. These include:

- **Stopping contaminated sediment from entering the Delta from such sources as the Cache Creek Settling Basin,**
- **Wetlands management, including in the Yolo Bypass, to reduce methylmercury production, and**
- **Constructing planned permanent barriers in the southern Delta to control sulfate concentrations which can affect methylation rates.**

Other actions should be required in Phase I. In particular, agencies responsible for flood conveyance flows, water management and storage, and dredging should immediately evaluate and undertake actions which have the potential to reduce methylmercury production, conduct characterization and control studies to evaluate those actions and identify any additional actions to reduce methylmercury production, and implement the additional actions without delay. Furthermore, this requirement should apply to ongoing operations of these agencies, rather than being triggered by new projects or operational changes and expansions (BPA, p. 10).

Recommendation: Methylmercury control actions, based on the best currently available information, should be incorporated into the TMDL and BPA now, with specific goals, evaluation requirements, and timelines. This includes ongoing operations of water agencies, in addition to new or expanded projects. The remediation plan should then be adapted as studies and evaluation measures provide more information over time.

R-157: Staff agrees that some mercury control actions should be started as soon as the Basin Plan Amendment is approved. In addition to actions described above, staff proposes that wetland projects scheduled for construction during Phase 1 be required to incorporate newly-developed, feasible methylmercury management practices into their design and management. Mercury reductions in the Cache Creek watershed are ongoing under the previously adopted Cache Creek mercury control program. Note that following discussions with agencies responsible for management of the Cache Creek Settling Basin, the proposed February 2010 Basin Plan amendments contain a schedule for developing a plan and implementing improvements to the settling basin to reduce mercury loads discharged, but improvements would not have to be completed until about 2021. The proposed Basin Plan amendments do not specifically recommend construction of barriers in the Southern Delta to manage salinity and sulfate. The draft Basin Plan amendments do state that agencies whose activities affect mercury and methylmercury, including salinity management, conduct methylmercury control studies, report results to the Board, and cooperate to meet methylmercury allocations for open water.

R-158: The letter's authors recommend that water management agencies be required to control methylmercury from ongoing operations, not just new projects. During the stakeholder process, staff also heard that State and federal agencies should have greater responsibility for addressing methylmercury. In the February 2010 draft Basin Plan amendments, staff proposed the following: State and federal agencies whose projects affect transport of mercury and production and transport of methylmercury must participate in Phase 1 methylmercury control studies. The purpose of the studies is to evaluate options for achieving methylmercury allocations assigned to State and federal water management agencies. The study requirements and allocations would apply to ongoing and new projects. In order to ensure that the methylmercury impairment does not worsen while dischargers work to meet their allocations, proponents of new projects (agency and private) would be required to incorporate feasible methylmercury management practices.

R-159: Instead of waiting until 2030, the letter's authors request that methylmercury reductions be required without delay. The Phase 1 studies are needed in order to identify effective control methods for various sources. Public agencies have commented that they do not have the resources to evaluate methylmercury production and implement controls for new projects, much less current ones. Staff listened to these comments, but continued to recommend in the February 2010 draft Basin Plan Amendments, that dischargers, including public agencies, be required to participate in the studies under a defined timeline.

Requiring Reductions from All Sources—Necessary Steps

As we have already said, there is no assimilative capacity in the Delta for further contributions of methylmercury, meaning that reductions will be needed from all sources, irrespective of the amount coming from any particular source. We therefore support the decision to incorporate allocations for in-Delta sources, including all wastewater treatment plants and municipal storm sewer systems that discharge to subareas not in attainment of the water-quality objective, in addition to allocations for tributary (streams) and other upstream sources that are seen as major contributors of methyl and inorganic mercury.

Evaluation and implementation of measures needed to achieve compliance with the water quality objective should be phased in immediately during Phase I rather than following the 8-year delay provided in the BPA (BPA, p. 7). In order to ensure that we achieve these reductions, we advocate that the following be incorporated into the TMDL requirements:

- Load reductions for MS4s (stormwater) during Phase I should be in line with reductions required for San Francisco Bay MS4s, rather than the TMDL's proposed "no change" policy of setting limits based on the 90th percentile of samples collected between 2000 and 2010 (BPA, p. 9).**
- Any new wastewater facilities should be designed and constructed to meet the water quality objective or at least to provide state-of-the-art performance with regard to methylmercury discharges, rather than having a "floating" standard based on the first 12 months of operation, as is provided in the BPA (BPA, p. 7).**

R-160: Staff agrees that within-Delta sources should receive methylmercury allocations. In the February 2008 and February 2010 draft BPAs, Staff did not recommend that MS4s be assigned numeric reductions for total mercury (as in the San Francisco Bay mercury TMDL) because the Delta program addresses both methylmercury and total mercury loads. The assimilative capacity, TMDL, and load allocations are calculated for methylmercury because this is the form of mercury in the Delta that most directly affects the beneficial uses. Total mercury loads from MS4s comprise a very small portion of the total mercury loads entering the Delta. Staff believes that it is important that point sources (MS4s and NPDES facilities) focus efforts on

reducing their methylmercury loads to a quantitative limit that is tied directly to the assimilative capacity. One relatively easy way for MS4s to make progress toward their methylmercury allocations is to limit total mercury entering and discharged from MS4 systems. MS4s have incentives to actually reduce their total mercury loads because of the Phase 1 requirements (implement best management practices and report those efforts to the Board) and to meet the methylmercury allocations. In general for storm water systems, water quality limits are achieved by verified implementation of best management practices.

R-161: The proposed Basin Plan amendments do not set methylmercury effluent limits for new NPDES facilities. However, the allocations for “new and expanded facilities” (Tables A and B) are calculated assuming a methylmercury discharge concentration of 0.06 ng/L. This is very close to “state of the art”, as methylmercury discharge concentrations from Central Valley NPDES facilities monitored in 2004 and 2005 ranged from 0.02 to 2.2 ng/L. For the methylmercury allocations, “new” facilities are those that begin discharging after the methylmercury allocations go into effect (beginning of Phase 2). As new facilities are planned, staff will work facility operators to make sure that the discharges from new facilities do not exceed the future growth allocations.

R-162: There may also be NPDES facilities that start discharging during Phase 1. The draft Basin Plan amendments state that total mercury limits for new Phase 1 facilities will be based on expected facility performance, confirmed and adjusted if necessary after one year of monitoring. Staff expects, though, that new facilities will be required to be designed for best practicable treatment, including low total mercury discharges. This has been NPDES staff’s practice for recently permitted, new facilities.

We would respectfully add that in evaluating the foreseeable methods by which NPDES-permitted wastewater treatment plants might comply with methylmercury allocations (BPA report, p. 82), the Board should consider that upgrades in treatment processes would also reduce discharges of pollutants other than methylmercury, and the benefits of such reductions should be taken into account when selecting a method of compliance. Such consideration also supports the cost effectiveness of such upgrades.

R-163: NPDES permits are reviewed and updated every five years. The review process is an appropriate time for the Central Valley Water Board to consider likely future discharge requirements and possible methods of limiting multiple pollutants.

It is our understanding that the contributions of mercury from upstream sources, including any of the mines, dredge fields, and areas above dams that are either not completely preventing downstream mercury flows or that may be removed in the upcoming years will be addressed in separate TMDLs developed for specific tributaries. Once again, however, the Delta methylmercury TMDL should establish and stipulate what reductions are necessary from these sources in order to assure that we achieve water quality and fish tissue objectives. The Delta itself has been given such a load allocation in the San Francisco Bay TMDL, which means that its objectives must not only ensure the health of the Delta, but reduce its impacts on its downstream neighbor.

Recommendation: Because of the lack of assimilative capacity in the Delta, the TMDL should require evaluation and implementation of necessary measures to attain water quality standards in Phase I from all sources discharging into impaired subareas, including stormwater and wastewater facilities. New wastewater facilities should employ state of the art technology to meet water quality standards and treatment upgrades should be considered in light of their ability to reduce not only methylmercury, but other contaminants as well. Finally, this TMDL should include

methyl and total mercury load allocations for upstream sources that will be addressed in other TMDLs.

R-164: Multiple stakeholders have commented that the Delta mercury control program should address upstream sources. Staff has not completed source analyses that would allow us to calculate enforceable methylmercury allocations for sources upstream of the Delta that could be incorporated into the Delta implementation plan right now. Staff will gather data and develop these source analyses for the upstream TMDLS. At the April 2008 hearing staff proposed that staff develop the upstream control programs during Phase 1 of implementation of the Delta TMDL and that no methylmercury control methods be required in the Delta and Yolo Bypass until the Board has adopted tributary TMDL control programs. Board members and stakeholders generally encouraged this approach. Thus, the draft February 2010 Basin Plan amendments contain a time schedule for the Regional Board to complete major upstream TMDLs before 2017.

Exposure Reduction Requirements—Need to Be Explicit

The TMDL does appropriately include the State Board’s language on exposure reduction (State Board Order 2005-0060). However, we are concerned that evaluation of programs to reduce exposure focuses primarily on risk communication, and not the development and implementation of *community driven* actions that reduce *actual* exposure by providing alternatives/options for fishers so that they can put food on the table and/or fulfill their cultural traditions. Furthermore, the list of potential actions in the BPA Report (p. 58) does not include potential actions which, in addition to reducing exposure, could also “*mitigate health impacts* to those people and communities most likely to be affected by mercury in Delta fish.” (State Board Order 2005-0060).

Recommendation: Reporting and evaluation requirements for permittees’ exposure reduction efforts should include activities related to the development and implementation of community driven programs that reduce actual exposure by providing options for those who, despite accurate information, continue to consume contaminated fish at unsafe levels for economic or cultural reasons. We further suggest that the last bullet listed should be amended to read:

“Coordination with affected communities to develop other risk management programs as needed, possibly including providing access to fish with less mercury or other protein sources and supporting or funding programs which address community health problems exacerbated by consumption of mercury in fish”.

R-165: Section 4.3.1 of the BPA Staff Report lists the following as a foreseeable method of compliance: “Coordination with affected communities to develop other exposure reduction activities, as needed, possibly including health screenings and intervention, if possible, to limit harmful effects of mercury exposure. “Other exposure reduction activities” could include providing access to fish with less mercury or other protein sources, if communities identified this as a need. Because details regarding exposure reduction activities have not been developed, staff did not suggest activities or provide examples in the Basin Plan Amendment language. Instead, the draft Basin Plan Amendment language was deliberately left without details in order to allow for activities that communities propose. The draft Basin Plan Amendments require that dischargers work with affected communities and public health agencies to develop and implement an exposure reduction program to reduce mercury exposure to people who eat Delta fish. The draft also requires that the program include activities “...that reduce the actual and potential exposure of and mitigate health effects to people and communities most likely to be affected by mercury in Delta fish.” This language is consistent with State Water Board

requirements. The language encompasses activities for reducing mercury exposure that go beyond public outreach and education. To ensure a broad interpretation, the proposed Basin Plan amendment section is titled “Exposure Reduction”, instead of “Public Outreach”. Staff does not believe that adding detailed language, such as providing access to other fish or protein, to the Basin Plan amendment is necessary.

R-166: If an affected community determines that providing access to other protein sources is needed to enable their subsistence fishers to reduce their mercury exposure, the current draft Basin Plan amendment language would allow this activity. Board staff recommends that such an activity be assisted by local and/or State agencies and other entities with expertise in nutrition education and supplementation.

R-167: Funded by the Central Valley Water Board, the UC Davis Department of Environmental Science and Policy and the Southeast Asian Assistance Center developed a report, “Community-Based Strategies to Reduce Mercury Exposure in Delta Fishing Communities”, which clearly points out the needs and benefits of including community organizations and fish-consuming residents in design and implementation of exposure reduction activities. The Strategies report does not detail the types of exposure reduction programs that each affected community or ethnic group believes would work best for them. Communities should be given opportunities to identify effective exposure reduction activities when the Delta TMDL’s exposure reduction program begins after adoption of the Basin Plan amendment.

Offsets—Prevent Disproportionate Impacts

While offsets are often seen by dischargers as an economically sound, and thus logical way to meet their permit requirements, they often resulted in at worst, additional pollution impacting local communities that are already over burdened and at best, a continuation of a status quo by which disadvantaged communities continue to be impacted by contamination and environmental degradation, while other more fortunate populations benefit from pollution reductions. Offsets can also create disincentives to do everything within reason to eradicate or aggressively reduce the production of pollution. For these reasons, offsets should be generally discouraged and pollution prevention activities and improved treatment technologies should be prioritized.³ [Footnote 3: As discussed in the previous section, treatment technologies and the expense associated with them should be evaluated with the recognition that they can address multiple contaminant problems.]

We do recognize that there may be times when a discharger, particularly public agencies who do not generate pollution but who must deal with it from other original sources, cannot meet their permit requirements despite doing all that is currently possible. There may be benefits to then allowing them to put resources toward addressing contamination elsewhere, so as to advance achieving water quality standards. However, offsets should only be allowed as a last resort if the discharger can demonstrate that they have done all they could to reduce their own load and with strict requirements to work with the impacted communities to identify an offset project that will benefit those that are most directly impacted.

Recommendation: The methylmercury TMDL would require public review and Board approval before dischargers could comply with their permits through offsets during Phase II. Such a structure should be fully incorporated earlier in Phase I with clear parameters outlined in the BPA that prioritize pollution prevention and reductions at the discharger’s facilities. Furthermore, the offset should provide benefits and pollution relief for the community most directly impacted by the pollution being offset. Before gaining Board approval, dischargers should work with impacted communities to identify such benefits and projects.

R-168: Staff agrees that offset decisions should be made in the public eye. The proposed Basin Plan amendments would require public review and deliberation in front of the Regional Board of an offset program and pilot offset projects. Staff and stakeholders discussed offsets during the stakeholder process. From these discussions came a set of key principles to guide offset projects that staff added to the February 2010 Basin Plan amendments. Among the key principles are: an offset project should only be allowed after a discharger implements reasonable control measures on-site and an offset project should not be allowed if local wildlife or human communities are disproportionately affected by insufficient actions on-site.

R-169: Potential impacts on communities downstream of a discharger proposing an offset project and the offset project can be evaluated when particular projects are being evaluated by the Regional Board. One objective of an offset program is to provide flexibility for dischargers, but another objective (stated in proposed Basin Plan amendments) is to encourage earlier and larger load reductions than would otherwise occur. Increasing the pace of methylmercury reductions could be considered important benefits for communities downstream of the discharger that is doing an offset project, provided that the offset project is within the same watershed.

Mercury, particularly methylmercury, poses a serious threat both to our human communities and the health and sustainability of our natural ecosystems. While we recognize that change will not occur overnight, we are also acutely aware that each child or pregnant woman who is exposed through their diet to high levels of mercury today is at risk and the impacts can be irreversible. For these reasons, the TMDL must:

- **Be based on goals that will protect subsistence fishers who consume high levels of Delta caught fish (Alternative 5, allowing 4-5 meals a week),**
- **Be aggressive in staunching the bleeding of further mercury from all sources into the watershed, with particular focus on bioaccumulative methylmercury/**
- **Not allow for delay in taking actions that, based on our current understanding will both reduce overall mercury levels, and, in particular, methylmercury as a means of protecting fishing communities (instead, incorporate a true adaptive management structure to enable remediation strategies to be improved as new data come to light),**
- **Ensure that community based exposure reduction strategies are developed, implemented, and evaluated to ensure actions to reduce *actual* exposure and to mitigate health impacts, and**
- **Set stringent parameters on potential offset projects to make certain that pollution prevention and the discharger's load reduction is prioritized first, and that projects that are implemented as a last resort ensure that impacted communities realize benefits and pollution relief.**

As organizations that prioritize our watersheds as well as the environmental health of our local communities, we have offered the recommendations contained herein in the spirit of working with the Board to strengthen the methylmercury TMDL. Please do not hesitate to contact us if you have any questions or if we can be of any assistance.

R-170: Please see staff's responses above.

9. County of Yolo

Letter date: 24 April 2008

From: Duane Chamberlain, Chair, Yolo County Board of Supervisors

Thank you for providing the opportunity to review the draft amendments and associated documents. Yolo County supports the effort to address the problem of mercury and methylmercury in the Delta. The County is concerned, however, that the documents do not reflect a sufficiently comprehensive view. We offer these comments for your further consideration:

- **The sources of total mercury are primarily the legacy of historic mining and abandoned mines should be a primary focus of control;**

R-171: Staff does not recommend a strategy that focuses only on reducing mercury from legacy sources because focusing only on legacy mercury is not expected to fully address the Delta impairment. Staff has recommended a strategy that would control modern methylmercury sources as well as legacy mercury sources because staff analyses indicate that:

- A control program that focuses only on legacy mercury would not reduce fish tissue methylmercury levels as quickly as implementing a program that addresses both legacy mercury sources and methylmercury sources;
- A legacy mercury control program likely would not achieve the proposed fish tissue objective in all areas of the Delta;
- Given that legacy mercury may comprise only about 30% of mercury entering the Delta, even if legacy mercury loads could be reduced to zero, we would still need to be concerned about activities in and around the Delta that contribute methylmercury; and
- There is adequate science and understanding of methylmercury cycling to have a TMDL based on methylmercury and an implementation program based on controlling both methylmercury and total mercury sources.

R-172: Staff's rationale for their recommended strategy was further summarized and discussed in the April 2008 hearing meeting and in the follow-up document, "Staff's Initial Responses to Board and Stakeholder Questions and Comments at the April 2008 Hearing"³⁶ (see item A-1, pages 3 through 12). Staff analyses were based on data published before the April 2008 hearing. Staff is currently re-evaluating methylmercury and total mercury source load estimates based on CalFed Mercury Program data published in October 2008 and will make the evaluation available for public review during the Phase 1 stakeholder process.

- **There should be a funding source that recognizes methylmercury is an environmental legacy of state and federal concern. Failure of this approach creates an inappropriate financial burden on local project proponents for this legacy issue.**

R-173: As discussed during the formal stakeholder process after the April 2008 hearing, funding is a significant issue for all of the sources assigned responsibility for the study and

³⁶ Available at: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/stakeholder_meetings/25nov08_hearing_rtc.pdf

management of methylmercury and total mercury. Identifying external sources of funding is a priority and will be further explored during development of the stakeholder group's Adaptive Management Approach for Implementing the Delta Methylmercury TMDL (also referred to simply as the Adaptive Management Plan or as the Memorandum of Intent [MOI]). The Adaptive Management Plan may contain specific strategies and possible funding sources, but the Basin Plan amendment language will not.

R-174: To better recognize that methylmercury is an environmental legacy of state and federal concern, the allocation strategy was adjusted since the April 2008 hearing meeting to incorporate the same percent reductions required for open-water habitat in all Delta/Yolo Bypass subareas as are required for other point and nonpoint sources that discharge to those subareas (rather than setting open water allocations equal to existing average annual methylmercury loads, as was done in the February 2008 draft report). In addition, the February 2010 draft Basin Plan amendments now include language that explicitly requires state and federal agencies whose projects affect the transport of mercury and the production and transport of methylmercury through the Yolo Bypass and Delta or manage open water areas in the Yolo Bypass and Delta (including but not limited to the Department of Water Resources, State Lands Commission, Central Valley Flood Protection Board, U.S. Army Corps of Engineers, and U.S. Bureau of Reclamation) to conduct Phase 1 methylmercury control studies and implement methylmercury reductions as necessary to comply with the open-water allocations by 2030.

- **The Board's current approach fails to consider the impacts of these decisions on the other activities in the Delta and Yolo Bypass offering great public benefit, such as habitat creation and flood management- the requirements will at minimum significantly increase the cost of public benefit projects and the time required to implement them, and could prevent them altogether.**

R-175: The Phase 1 control studies and implementation of management practices will increase the cost and extend the time for completion of some projects. However, each project is not required to conduct individual studies. There will be economy of scale and time if a well-designed, comprehensive study is conducted and produces results that are applicable to multiple habitat creation and flood management projects. In addition, implementation costs can be decreased if:

- Entities responsible for meeting subarea methylmercury allocations collaboratively focus implementation efforts on sources with the most feasible methylmercury reduction measures (i.e., measures that are cost effective and do not have significant environmental impacts) within each subarea; and
- Entities responsible for meeting both waste load and load allocations help develop and participate in an offset program or other watershed approach to implementation.

R-176: In this way, per-project costs and time delays would be minimized. More discussion on this topic is provided in the February 2010 draft BPA Staff Report, Section 4.4.1 (Potential Environmental Effects) in Chapter 4 and Section 7.4 (Economic Factors) in Chapter 7.

- **The approach does not appear to recognize the many ongoing state planning processes for the Delta.**

R-177: Chapter 6 in the February 2010 draft BPA Staff Report describes the 14 State Water Board policies, seven Central Valley Water Board policies, and 14 other statewide and local laws, policies, and programs identified by staff and stakeholders with which the Delta

mercury control program needs to be coordinated, including but not limited to the California Wetlands Conservation Policy, Delta Vision Strategic Plan, Bay Delta Conservation Plan (BDCP), Federal Bay-Delta Leadership Committee, and other Habitat Conservation Plans and Natural Community Conservation Plans. Many of the stakeholders who participated in the formal stakeholder process after the April 2008 hearing meeting participated in the Delta Vision Blue Ribbon Task Force and other efforts to develop the implementation plan for the Delta Vision Strategic Plan. In addition, the formally-seated Stakeholder Group formed after the April 2008 hearing meeting includes 21 categories of Delta stakeholder interests, including a BDCP representative as well as representatives of habitat conservation, environmental justice, public health advocates, agriculture, stormwater treatment, Delta county governments, environmental advocates, regional wastewater treatment, and state and federal agencies with various roles in the Delta (see Chapter 8 in the February 2010 draft BP Staff Report).

R-178: Staff worked with stakeholders to modify the implementation requirements in the February 2008 draft Basin Plan amendment such that Phase 2 of the control program would not begin until the Board has reviewed the program and adjusted requirements, as necessary, based on results of the Phase 1 studies and discussions. During Phase 1 there is time for additional collaboration with public agencies and stakeholders to better integrate the Bay Delta Conservation Plan, Delta Vision, California Bay-Delta Program Ecosystem Restoration, the Delta Risk Management Strategy, FloodSAFE California, and other efforts with the implementation of the Delta mercury control program. During Phase 1, staff will develop the upstream control programs and have a more comprehensive plan for controlling within-Delta and tributary sources when staff returns to the Board after the Phase 1 methylmercury studies are completed.

- **The Board's approach does not appear to be consistent with provisions in the Cache Creek TMDL, such as the language giving the executive officer the authority to prioritize studies, or to set or waive mitigation requirements for habitat restoration projects.**

R-179: The Cache Creek mercury control program has Executive Officer exemptions for: (1) Erosion control requirements near bank swallow habitats, and (2) Controlling methylmercury from new reservoirs, ponds, and wetlands when (a) all reasonable management practices to limit methylmercury discharges are being implemented, and (b) the projects are being developed for the primary purpose of enhancing fish and wildlife beneficial uses. The Cache Creek program requires implementation of reasonable methylmercury mitigation measures for habitat restoration projects. Similarly, the proposed Delta program requires projects to conduct methylmercury control studies and implement management practices as feasible. The proposed Delta Basin Plan amendment does not limit creation of wetland projects. In addition, the February 2010 draft BPA more explicitly defines a Phase 1 Program Review that must take place before implementation of methylmercury controls is required to comply with the proposed methylmercury allocations; the Board can determine whether to waive mitigation requirements for specific habitat restoration projects during the Phase 1 Program Review. The February 2010 draft BPA also explicitly states that dischargers may conduct characterization studies to inform and prioritize the Phase 1 control studies (see page BPA-6).

- **The approach does not appear to be coordinated with the efforts of our state and federal legislators. Assemblywoman Wolk recently held a hearing on mercury issues and federal representatives are considering a request to appropriate \$2.5 million to the Army Corps of Engineers Remediation of Abandoned Mines program for clean up of mines in the Sacramento River watershed. Senator Diane Feinstein also has authored**

a bill related to abandoned mines.

R-180: The draft Basin Plan amendments for the Delta mercury control program include allocations for point and nonpoint sources within and tributary inputs to the Delta and Yolo Bypass; its implementation plan focuses on methylmercury and inorganic mercury sources within the Delta/Yolo Bypass. However, the draft Basin Plan amendments also include requirements for a 110 kg/yr reduction in total (inorganic) mercury loads from the tributary watersheds, with the recommendation to initially focus on watersheds that export the most mercury-contaminated sediment (e.g., the Feather, American and Cosumnes Rivers and Cache and Putah Creeks). TMDL control programs developed for upstream watersheds will focus on how to comply with the tributary methylmercury allocations and watershed total mercury load reduction requirements included in the Delta TMDL, including requirements for control actions for individual sources within the tributary watersheds.

R-181: Board staff has tracked legislative efforts related to the cleanup of abandoned mines and other mercury issues (e.g., AB909 and AB2901) and on 11 March 2009 met with State Senate Budget Committee staff, representatives from the Sierra Fund, and other stakeholders to discuss funding needs for methylmercury monitoring and best management practice evaluation for wetland restoration projects. Board staff will continue to coordinate with state and federal agencies and legislators during Phase 1 of the Delta mercury control program and during the development and implementation of the TMDL control programs for the upstream watersheds, especially where state and federal abandoned mine cleanup activities and water management projects take place.

Yolo County respectfully requests that the Board extend the time to complete the basin plan amendment to allow for further examination of these issues, and further collaboration with the stakeholders in the Delta and in those areas upstream that may be affected by the amendments. Yolo County will propose specific changes to the basin plan if granted additional time to review the proposed amendment.

R-182: As described in Chapter 8 of the February 2010 draft BPA Staff Report, the Board extended the BPA development time by two years.

10. Delta Protection Commission / Delta Methylmercury TMDL Collaborative

Letter date: 24 April 2008

From: Linda Fiack, Executive Director, Delta Protection Commission, on behalf of the Delta Mercury Collaborative

Thank you for providing this opportunity to review the subject documents (hereafter "Basin Plan Amendment or BPA"). The full report includes proposed amendments to Basin Plan language, followed by several attachments explaining the amendments. Comments provided in this letter focus on the BPA. These comments are submitted to you on behalf of the Delta Methylmercury TMDL Collaborative (Collaborative).

In late 2005, the State of California's Delta Protection Commission (DPC) convened a collaborative of Delta stakeholders representing local, state, federal agencies and non-profits – see attached list – to provide input to your Board for consideration in the development of a TMDL and Implementation Plan for Methylmercury in the Delta. It was and continues to be the desire of the Collaborative to provide input to the Regional and/or State Board's efforts to satisfy mandates imposed by the U.S. Environmental Protection Agency, and to assist the Board in developing meaningful and realistically feasible programs to do so.

The Collaborative has spent time over the last two and one-half years reviewing documents produced by Board staff, participating in public workshops and providing comments to the Board. Previous correspondence from the Collaborative is attached.

Several members of the Collaborative came together in April of this year to discuss its views of the current BPA documents. What follows is a listing of concerns and possible different approaches offered by the following organizations who participated in the 2008 Collaborative: Yolo County, Yolo HCP/NCCP Joint Powers Authority, Yolo County Flood Control and Water Conservation District, The Nature Conservancy, Sacramento Regional County Sanitation District and the Delta Protection Commission.

Our focus is on how previous Collaborative correspondence has been taken into consideration by Board staff in the current documents. The Collaborative shares the same goals as the Regional Board to reduce mercury exposure to people and wildlife that consume Delta fish, and to remove it from the environment. However, we feel there is a more effective approach than that taken by Board staff in the Program Plan of Implementation to meet the TMDL requirements.

Summary of significant issues raised by the Collaborative over the past 2 years

- Concern over impact of BPA on other beneficial activities in the Delta and Yolo Bypass;
- Concern over lack of benefit/cost analysis that takes into account the costs to reduce mercury by beneficial activities in the Delta such as habitat creation, flood control, agriculture, wastewater treatment and dredging;
- Concern that the Delta BPA is limited by the Basin Plan Amendments already in effect for Cache Creek and San Francisco Bay;
- Creation of a funding burden to in-Delta interests for an environmental legacy issue of statewide concern and a lack of funding to accomplish objectives

Current concerns of the 2008 Collaborative participants

Focus on legacy sources of total mercury. Pursue State and federal funding to reduce legacy source loads.

- **The sources of total mercury should be the primary focus of control and be weighted much more heavily for control efforts than projects such as habitat creation or alternative flood control approaches that have public benefit mandates. To add a large burden of financial cost and lost time through “characterization and control studies” to new public benefit projects is unreasonable compared to expending more control effort on the legacy sources of mercury.**

R-183: Staff has carefully considered comments from the Delta Mercury TMDL Collaborative. Although staff was invited to address the Collaborative only once, staff has worked with Collaborative members on specific issues and attempted to address concerns. We appreciate the consistent involvement of some of the Collaborative members in the Delta mercury TMDL stakeholder process that began in December 2008.

R-184: Staff continues to recommend that the program contain controls for methylmercury and total mercury. Controlling just on total mercury would increase the time until fish tissue concentrations decline in Delta fish and may not ever resolve the mercury impairment. To improve conditions in the Delta, efforts would have to be focused on contaminated stream beds and banks below major dams, which trap mercury on sediment. It may be infeasible to remove much of this mercury without disrupting existing floodplain habitat and/or interfering with flood control activities. Staff agrees that more total mercury efforts upstream of the Delta are necessary. Staff proposes that the Basin Plan amendment commit the Regional Board to a time schedule for upstream TMDLS to be completed during Phase 1, before any within-Delta interests are required to actually implement methylmercury controls. After discussions with stakeholders, staff also reduced the likely cost of Phase 1 studies by only requiring the methylmercury control portion, not methylmercury source characterization.

Also, legacy³⁷ mercury may comprise only about 30% of total mercury entering the Delta [“Staff’s Initial Responses to Board and Stakeholder Questions and Comments at the April 2008 Hearing”³⁸ (see item A-1, pages 3 through 12)]. In addition, even if control actions are implemented to remediate legacy mercury in the Delta’s tributary watersheds, it would likely take natural processes many centuries to completely remove the legacy mercury already in Central Valley river beds and channels. Evidence supporting this assertion comes from the source analysis of total mercury that continues to enter the Delta years after the mercury and gold mining period and studies of contaminated sediment transport conducted elsewhere. The magnitude of legacy, mine-related mercury spread through river beds and banks downstream of major dams that continues to erode the Delta and difficulties in controlling these loads is discussed under Question #1 (page 3) and additional discussion about the time needed for natural processes to flush in-channel sediments from the Delta are included under Item #22 (page 44) in staff’s “Initial Responses to Comments at the April 2008 Hearing”.

³⁷ Board staff refers to mercury from historic mining operations in the Coast Ranges and Sierra Nevada that was released to Central Valley waterways by historic operations as well as by past and present erosion of excavated overburden and tailings as “legacy mercury”.

³⁸ Available at: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/stakeholder_meetings/25nov08_hearing_rtc.pdf

As a result, even if legacy mercury loads could be reduced to zero, we would still need to be concerned about activities in and around the Delta that contribute methylmercury. Given available information about wetland restoration goals for the Delta (e.g. the Record of Decision (ROD) for the California Bay-Delta Authority commits it to restore 75,000 to 90,000 acres of additional seasonal and permanent wetlands in the Delta, which represents about a three to four times increase in wetland acreage from current conditions (about 21,000 acres)), and their potential to increase methylmercury loading to the Delta, we need to have a mercury control program that is more comprehensive and protective of the environment and subsistence fishers who cannot wait for centuries for improvements.

For a detailed explanation of why staff is not focusing only on total mercury, please see “Staff’s Initial Responses to Board and Stakeholder Questions and Comments at the April 2008 Hearing”.³⁹

Also, Board staff included a review of economic factors as part of the environmental analysis in Chapter 7 of the February 2010 draft BPA Staff Report (see Section 7.4) that recognizes the potential economic impacts on municipalities, wetland managers, agriculture, and other entities required to conduct methylmercury control studies, monitoring, and methylmercury management practices. Section 7.4 also identifies a variety of different funding sources that could contribute towards study, monitoring and implementation costs.

Do not require stakeholders to spend limited resources answering basic scientific questions.

- **The BPA process should be more comprehensive than the science of TMDL setting to include the practicality of implementation and recognizing the potential negative impacts on other important public benefit issues in the Delta. The BPA will significantly increase the cost of any public benefit projects done in the Delta and consume time that could be critical. A very localized population is being required to shoulder significant costs. It is not reasonable to place a burden on new projects having public benefit objectives, being funded with public funds, to reduce mercury which has largely been created by legacy sources.**

R-185: Following discussions with stakeholders, staff reduced the proposed Phase 1 study requirements by eliminating the source characterization portion. The emphasis is now on developing control methods (which has been required of dischargers for other pollutants) and not on basic science, such as mercury cycling. Public money via several grant projects has been already spent to investigate factors controlling methylmercury and possible management measures in wetlands and rice. Some stakeholders are seeking more grant money to continue and expand these studies. Within-Delta dischargers are only responsible for Phase 1 control studies that address their contribution to the methylmercury load in the Delta. After the Regional Board reviews and revises requirements, as needed, through a second Basin Planning process, within-Delta sources may still be required to implement methylmercury controls for the portion of methylmercury which they contribute. Within-Delta projects will have costs associated with participating in Phase 1 methylmercury control studies, but does not expect that costs or time of any particular project will be significantly increased.

³⁹ Available at:
http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/stakeholder_meetings/25nov08_hearing_rtc.pdf

R-186: Staff agrees that publicly-funded agencies and programs need to work together. If a Delta project expected to increase the methylmercury load is publicly funded, agencies working together may be able to increase the money allotted to the project, to provide for methylmercury control, either on-site or mitigation such as reducing “legacy” mercury upstream. Improving water quality and providing a safe fishery for humans and wildlife are public benefits. Note that “legacy” mercury (i.e., mercury pollution related to gold rush activities) is only a portion of the total mercury entering the Delta and is estimated to be less than half of the total. Other sources are mercury in native soil (particularly from the Coast Range), atmospheric deposition, thermal springs, urban runoff, and wastewater treatment plants.

Recognize and coordinate better with other on-going Delta processes.

- **As stated in the Collaborative’s letter of November 18, 2005 to the Board, it is critical that the other significant public processes underway in the Delta be identified and collaborated with in the BPA process. While TMDLs must be set based on science, the Program Plan of Implementation is the place where, for the most effective and practical approach to achieving the TMDLs, integration with the other Delta planning processes must take place. We do not find that recognition of these other very important public processes has occurred and therefore it does not appear that integration or collaboration has occurred: this is an opportunity lost to be most effective with scarce public funds and equally important, balance competing public objectives.**

R-187: After the April 2008 hearing, staff engaged stakeholders in a year-long stakeholder collaboration process. Staff also increased its interaction with other Delta programs and processes, such as the Bay Delta Conservation Plan effort, dredging, wetland restoration projects (through 401 water quality certification), and flood management (particularly with DWR). Staff will continue to work with other Delta programs and processes during Phase 1 of implementation.

R-188: The Central Valley Water Board will adaptively manage the Delta mercury control program. The proposed Basin Plan amendment commits the Regional Board to reviewing feasibility and potential impact of methylmercury controls before methylmercury control actions are required. The Regional Board does not yet have enough information to make the decision that for a particular methylmercury source, methylmercury controls are infeasible or other public benefits compel an exemption from methylmercury reduction requirements. During Phase 1, staff would like to work with Collaborative members to determine potential negative consequences of specific requirements on specific projects and processes. Neither the Regional Board nor the Collaborative has yet developed such detailed information. For additional response, please see “Staff’s Initial Responses to Board and Stakeholder Questions and Comments at the April 2008 Hearing” (#17 stakeholder interactions and #19 cost benefit analysis).

Add language to allow for over-riding considerations

- **It is problematic that the TMDL documents do not specify the methods staff is using to determine “potential for increase” in methylmercury and mercury. It is unsettling not to know how the Regional Board staff will measure potential increase. There needs to be a definition of what is going to trigger various mitigation requirements and how and what entity will determine if mitigation is appropriate or sufficient.**

R-189: Staff will consider options for rephrasing “potential to increase ambient mercury and/or methylmercury levels”, which is used with the description of entities and projects required

to participate in methylmercury control studies. The potential to increase ambient methylmercury levels could also be phrased as the likelihood that a project will make a measurable difference in methylmercury concentrations (fish or water). For new projects, methylmercury production will not be known but will have to be estimated. Staff anticipates the process and level of detail to be similar to consideration of other potential environmental impacts currently required for compliance with the California Environmental Quality Act. Staff agrees that mitigation requirements should be defined. This activity should be done during Phase 1, when there is a better understanding of what source types need mitigation and be discussed during the public program review at the end of Phase 1.

- **Regional Board staff should not determine what is adequate project mitigation for mercury reduction due to the fact that there are competing public benefit objectives in the Delta. The Executive Officer of the Board should be given this responsibility which was done in Basin Plan Amendment language the Regional Board approved for Cache Creek in Yolo County for habitat creation. This language should be extended to flood control, dredging and other publicly important types of projects in the Delta. Examples of this language for Cache Creek are:**

“The Executive Officer will to the extent appropriate, prioritize the need for feasibility studies and subsequent remediation actions based on mercury concentrations and masses, erosion potential and accessibility.”

“Upon written request by project proponents, the Executive Officer may waive the turbidity monitoring requirements for a project, or group of projects, if the project proponents submit an alternative method for assessing compliance with the turbidity objective.”

“The Executive Officer may waive, consistent with State and federal law, the requirement for erosion control from a project conducted in the 10-year flood plain for habitat conservation or development activities for bank swallows that are proposed under the State’s adopted Bank Swallow Recovery Plan.”

“The Executive Officer will consider granting exceptions to the no net increase requirement in methylmercury concentration if: 1) dischargers provide information that demonstrates that all reasonable management practices to limit discharge concentrations of methylmercury are being implemented and 2) the projects are being developed for the primary purpose of enhancing fish and wildlife beneficial uses. In granting exceptions to the no net increase requirement, the Executive Officer will consider the merits of the project and whether to require the discharger to propose other activities in the watershed that could offset the incremental increases in methylmercury concentration in the creek. The Regional Water Board will periodically review the progress towards achieving the objectives and may consider prohibitions of methylmercury discharge if the plan described above is ineffective.”

R-190: As described above, the Regional Board is not determining mitigation requirements at this time. The Regional Board does not have information at this time to provide blanket exemptions or waive requirements for particular activities. The Collaborative seems to have assumed a worst-case scenario that that reducing methylmercury always competes with other public benefit activities in the Delta. Based on data from wetlands, farmed Delta islands, and wastewater treatment facilities, methylmercury is not produced uniformly from all individual sources within a source category. Staff agrees that reducing methylmercury produced in flood conveyance systems or through particular water management measure may be more difficult than inputs like wetlands and treatment facilities. In the proposed Basin Plan amendment, State

and federal agencies with jurisdiction over these activities must evaluate the feasibility of reducing methylmercury while carrying out their primary mandates and provide information to the Regional Board for the Phase 1 program review. It is important to remember that the purpose of the TMDL implementation program is to remove the methylmercury impairment, as required under the federal Clean Water Act. If some sources are unable to reduce methylmercury, the methylmercury allocations for other sources may have to become more stringent. Regardless of the TMDL requirements, "Publicly important projects" such as dredging, habitat restoration, and flood control must comply with federal and State environmental laws, including the Clean Water Act and the California Environmental Quality Act (CEQA). Although not commonly done, a project that increases methylmercury loads to the Delta, which is already impaired, should address the increased methylmercury as a water quality impact in the projects CEQA analysis.

R-191: Staff is confused by the Collaborative's distinction between Regional Board staff and Executive Officer decisions. Regional Board staff provides technical information and recommendations. Orders and other requirements are only issued after direction by the Regional Board members or the Executive Officer.

R-192: The above examples from the Cache Creek TMDL Basin Plan amendment were specifically written for the Cache Creek mercury control program. For each of the four examples quoted above, staff explains the comparable language in the proposed Delta Basin Plan amendments and/or why the example is not applicable to the Delta program.

- *Example #1, Executive Officer will prioritize need for feasibility studies and subsequent remediation actions.* In the proposed Delta program, stakeholders will develop Phase 1 study plans, aided by a technical advisory committee and staff. Stakeholders are encouraged to develop collaborative studies and will have the ability to prioritize the focus of studies by methylmercury source type or subarea. The Executive Officer will approve the study plans after receiving recommendations from the TAC. Phase 1 studies are concerned with methylmercury control because within-Delta sources must reduce methylmercury. In contrast, feasibility studies in the Cache Creek program would address erosive areas naturally high in mercury.
- *Example #2, Executive Officer may waive turbidity monitoring if alternative method is provided.* During development of the Cache Creek mercury program, the Board agreed with Yolo County's technical advisory committee that typical water quality monitoring for turbidity in Cache Creek, which is often highly turbid, is not the most effective method of documenting that a stream channel project, (i.e., invasive species removal) adequately controlled erosion, as required by Regional Water Board permit. The proposed Delta program does not require turbidity monitoring.
- *Example #3, Executive Officer may waive requirements, consistent with State and federal law, for projects that implement the adopted Bank Swallow Recovery Plan.* The Board approved this language for the Cache Creek Basin Plan amendment during the public hearing. Bank swallows are listed under the California Endangered Species Act (ESA) as a threatened species. The California ESA requires that the State prepare and implement recovery plans for listed species. The Board allowed the Executive Officer to consider exempting bank swallow recovery projects from erosion control requirements because the two activities were clearly and directly in conflict: bank swallows require loose, eroding stream banks for nesting sites. Only activities conducted under the Department of Fish and Game's official Bank Swallow Recovery Plan (December 1992) may be considered for this potential exemption.

Similar habitat conflicts could exist in the Delta for other threatened or endangered species, but have not been specifically identified. To be addressed in the Delta methylmercury program, the Board would need evidence that the proposed action that conflicts with methylmercury control is being conducted to comply with the State and/or federal ESA.

- *Example #4, The Executive Officer will consider granting exceptions to the requirement for no net increase in methylmercury concentration if reasonable controls have been implemented and the project benefits fish and wildlife.* The Cache Creek program requires implementation of reasonable methylmercury mitigation measures for habitat restoration projects. Similarly, the proposed Delta program requires projects to conduct methylmercury control studies and implement management practices as feasible. The proposed Delta Basin Plan amendment does not limit creation of wetland projects. In addition, the February 2010 draft BPA defines a Phase 1 Program Review that must take place before dischargers must implement methylmercury controls. The Board can determine whether to waive mitigation requirements for specific habitat restoration projects during the Phase 1 Program Review.

Note that for nonpoint source discharges, the methylmercury allocations in the Delta control program will likely be less stringent than the “no net increase” requirement of the Cache Creek methylmercury program. Under the proposed Delta program, managed wetlands and irrigated agriculture are only required to control methylmercury produced by the particular source (i.e., the net methylmercury discharge or total methylmercury discharged minus methylmercury in source water). Since no proposed Delta reduction requirements are 100%, the proposed load allocations allow for methylmercury discharge greater than the incoming water.

The Collaborative recommends that the Regional Board extend the time for completing the Program Plan of Implementation so that a truly collaborative process among all Delta stakeholders, professionally facilitated, can be conducted in order to have the most effective chance at real and sustainable reductions of mercury in the environment and achievement of other very important public benefit goals in the Delta. In addition, the Regional Board should pursue state and federal funds for remediation of abandoned mines.

In closing, the Delta Mercury Collaborative appreciates this opportunity to comment on the work of the Regional Board staff and requests the Board engage all stakeholders in this issue in a collaborative effort. Please contact Suzanne Butterfield, Deputy Director for Special Projects, Delta Protection Commission, at 916-776-2291 with any questions for the Collaborative.

R-193: From November 2008 through January 2010, staff engaged in a professionally facilitated stakeholder meeting process. The proposed February 2010 Basin Plan amendments are the result of the stakeholder process.

R-194: To the fullest extent appropriate as an agency of the Executive Branch of the State of California, the Regional Board and staff will continue to support allocation of State and federal funds for mercury remediation. Board staff has tracked and provided information for California legislative efforts related to the cleanup of abandoned mines and other mercury issues (e.g., AB909 and AB2901). On 11 March 2009, staff met with State Senate Budget Committee staff, representatives from the Sierra Fund, and other stakeholders to discuss

funding needs for methylmercury monitoring and best management practice evaluation for wetland restoration projects. Board staff will continue to coordinate with state and federal agencies and legislators during Phase 1 of the Delta mercury control program and during the development and implementation of the TMDL control programs for the upstream watersheds, especially where state and federal abandoned mine cleanup activities and water management projects take place.

11. Fraser Shilling, Ph.D., University of California, Davis

Letter date: 22 April 2008

From: Fraser Shilling, Ph.D., Department of Environmental Science and Policy & Environmental Justice Project University of California, Davis

Thank-you for the opportunity to comment and provide input on the Methyl-Mercury TMDL for the Delta region and the proposed Basin Plan amendment. I will be referring to the Board staff's excellent report and the proposed TMDL with major comments. I will use my professional experience with mercury contamination, watershed processes, and subsistence fishing and fish consumption practices as the basis for these comments.

For the last decade, I have been involved in various projects that involve applied research into the area of abandoned mine contributions of mercury, distribution of risk factors associated with mercury bioaccumulation, fish consumption patterns in contaminated areas, and policy strategies for solving fish contamination. I am the lead author of the California Watershed Assessment Manual, as the result of a 3-year contract from CALFED. I have carried out special studies for the Delta Mercury Tributaries Council, the Sacramento Regional County Sanitation District (SRCSD), and the California Department of Public Health, Environmental Health Investigations Branch. My expertise is in geographic information systems modeling, aquatic ecology, water quality, watershed processes, and the intersection of policy and planning with scientific information. I have published over 3 dozen papers and reports in these and other areas. More recently, I have been coordinating an investigation of fish consumption patterns, fish advisory awareness, and health communication effectiveness in collaboration with two community organizations – People for Children's Health and Environmental Justice and the Southeast Asian Assistance Center. This project has been funded by the SRCSD and the California Endowment and is the most comprehensive, extensive, and longest-running project of its kind in the Central Valley (Appendix A – interim report). I was also the lead for a Regional Board funded strategic plan development for the consideration and inclusion of people and impacted communities in TMDL and other pollution abatement decision-making (Appendix B – draft report). In this strategic plan, 30 key stakeholders representing impacted communities, local agencies, state and federal agencies, and academic scientists were interviewed. Based on these interviews recommended strategies were developed.

Major Comments:

1) Apparently implementation of the TMDL is proposed to start with an eight-year study period prior to requiring or carrying out significant abatement of mercury inputs, mercury methylation, and mercury bioaccumulation. In my experience over the last decade and based on stakeholder interviews, there is sufficient scientific information and there have been sufficient pilot management projects that an adaptive pollution abatement program is warranted rather than another eight years of study. Studies should accompany management and regulatory actions in order to ascertain effectiveness and an adaptive management loop established linking monitoring and evaluation findings with new policy and management decisions.

R-195: The draft Basin Plan Amendments do name some mercury control actions that are to be completed during Phase 1, simultaneously with the methylmercury characterization and control studies. Staff's proposed early implementation actions are:

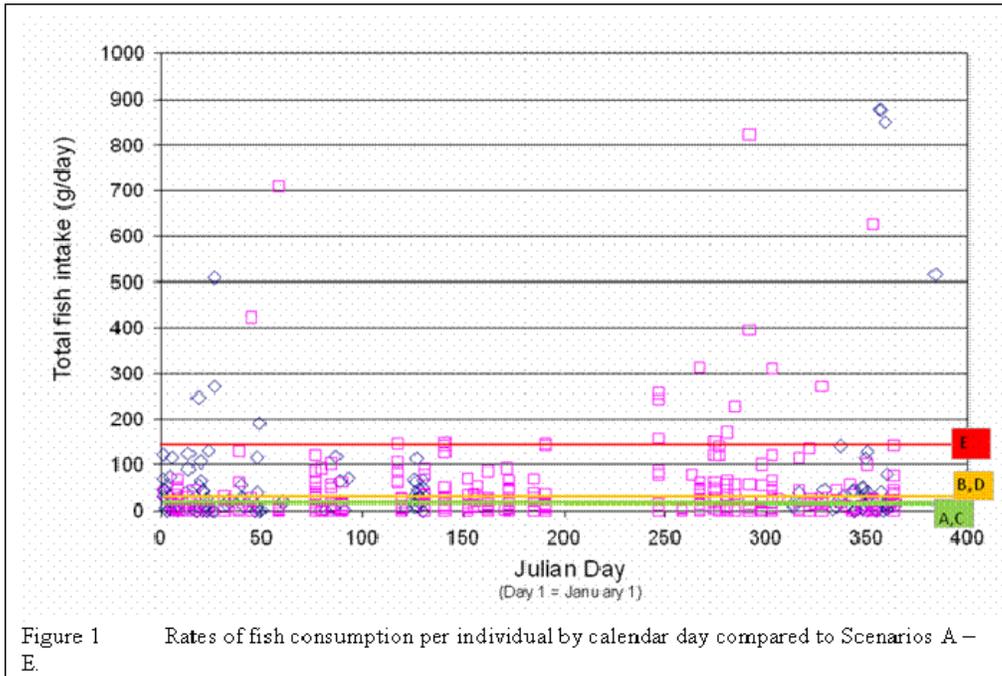
- NPDES-permitted facilities must implement mercury minimization programs and report results to the Board annually;

- Municipal storm water systems must implement best management practices to control mercury discharges and report results annually;
- Dredging and dredge material reuse activities must minimize sediment releases during operations (also prevents release of sediment-bound mercury and methylmercury) and ensure dredged material does not eroded back into Delta waterways; and
- Regional Board and others will start work in the American and Feather Rivers and Putah Creek and continue work in Cache Creek to reduce mercury loads by a total of 110 kg/year.
- All dischargers implement reasonable, feasible controls for inorganic mercury. During Phase 1, all dischargers should implement methylmercury management practices as they are identified.

R-196: Staff believes that studies are a necessary part of Phase 1 to obtain specific information for methylmercury control. Previous studies allowed staff to identify source categories and estimate methylmercury and total mercury loads. The Phase 1 studies will identify effective management practices to control methylmercury. This information is currently lacking. For example, in seasonally flooded areas, methylmercury production typically peaks soon after flooding. Land managers and Board staff need more information to know what management measures (e.g., vegetation control, flow changes, aeration, or other) will limit methylmercury discharges and whether methylmercury management will conflict with other land uses, such as endangered species habitat or flood control. Similarly, wastewater treatment discharges show a wide range of methylmercury concentrations, but factors controlling the low concentrations in some facilities need to be identified before facilities discharging high concentrations can implement control measures.

2) The target fish tissue methyl-mercury and waterway methyl-mercury concentrations are based on fish consumption rates that are too low and do not reflect our understanding of actual rates of fish consumption (TMDL Report Section 4.6). In addition, the report states on page 42 that “A comprehensive survey of consumption of Delta fish has not been conducted. Thus, staff examined San Francisco Bay and national fish consumption studies, as well as several localized and pilot studies in the Delta, to develop Delta-specific consumption scenarios and ultimately recommend targets for human protection.” In fact such a study has been conducted over the last 2 ½ years and data analysis will be completed in June, 2008 (“Delta Consumption Study”, Appendix A). The report provides three main rates of consumption based on a combination of USEPA surveying for the US population (17.5 g/day to 142 g/day) and CDPH surveying of San Francisco Bay anglers (32 g/day). These rates are 95th percentile and higher rates for these populations. The rates are used to determine fish tissue targets to protect human health and are therefore important pieces of information. Scenarios A and C use a rate of 17.5 g/day and result in trophic level 4 (TL4) fish tissue Hg target concentrations of 0.29 to 0.40 mg/kg. Scenarios B and D use a rate of 32 g/day and result in target concentrations of 0.16 to 0.22 mg/kg. Scenario E uses a rate of 142 g/day and results in a target concentration of 0.05 mg/kg. A reasonable question is whether or not these fish consumption rates reflect actual consumption rates for anglers and their families in the Delta and are therefore useful in developing protective fish tissue targets and resulting discharge requirements. The bottom line from the Delta Consumption Study reported in Appendix A is that the 17.5 and 32 g/day rates are lower than mean rates for 21 of the 23 ethnicities eating fish caught in the Delta. They are lower than 90th and 95th percentile rates for all ethnicities. For anglers, the arithmetic mean total fish intake rate = 57 g/day (+ 11.8, 95% CI, n=375); range = 0 to 879 g/day; 90th percentile consumption rate = 123 g/day,

95th percentile = 199 g/day. In this respect the rates in the TMDL are not protective (in the linkage to fish tissue targets) of the average consumer of most ethnicities and the high consumers of all ethnicities. The scenario A – E rates are shown in comparison with the Delta Consumption Study (Figure 1). The individual rates shown also reflect that rates of consumption vary seasonally, corresponding to peak in fishing activity.

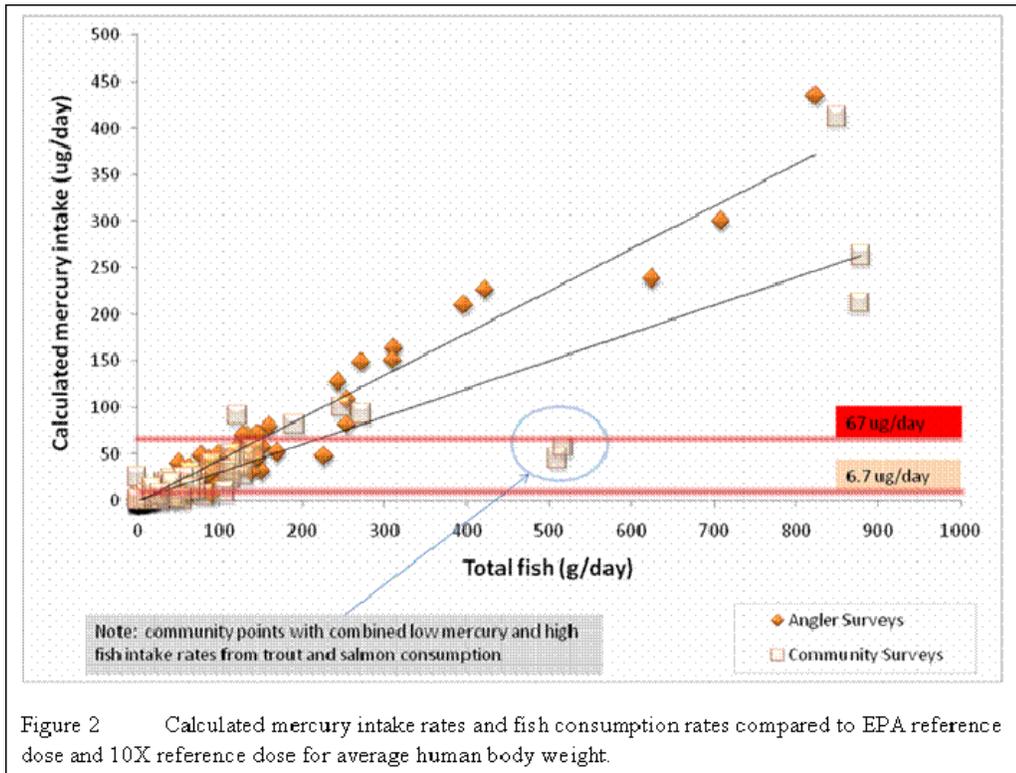


R-197: Staff recognizes that there are people who eat more than one meal per week of Delta fish. A goal of the TMDL is to reduce methylmercury levels so that the fish that are now highest in mercury may be safely eaten at least once per week. Staff evaluated multiple consumption scenarios in the Delta mercury TMDL report and provided four consumption rate alternatives for the Board to consider in the Basin Plan Amendment staff report. The most protective alternative provided for the Board to consider would allow people to safely eat 4-5 meals per week of high-mercury fish (bass and catfish). Staff recommends water quality objectives that are as protective as possible while having a reasonable assurance of being achieved. Please also see staff’s responses to the comment letters from Aubrey White and from Clean Water Action, Environmental Justice Coalition for Water, and BayKeeper, and regarding the basis of staff’s recommendation for water quality objectives.

R-198: Following discussions during the stakeholder process, staff added to the February 2010 draft Basin Plan amendments this statement: “The long-term goal of the mercury program is to enable people to safely eat four to five meals per week of Delta fish”.

3) Mercury intake rates can be calculated based on fish species consumed, location the fish were caught, and rates of consumption. This is a critical step in evaluating actual risk and exposure for fish consumers in the Delta, but is missing from the TMDL report. The Delta Consumption Study made such calculations (Figure 2 and Appendix A). Most fish consumers interviewed have mercury intake rates greater than the EPA reference dose. About 5% have intake rates greater than 10 times the reference dose, which puts

them in a range where health impacts are possible or likely. The highest intake rates are almost 70 times the reference dose.



R-199: Staff very much appreciates having this Delta fish consumption and intake information and has provided it to Board members and stakeholders in discussions, stakeholder meetings, and the draft 2010 staff reports. Staff agrees that an estimated 5% of anglers and their families having a methylmercury intake that is 10-times the reference dose is a very serious health concern. Because health concerns exist now, staff is proposing a Delta mercury control program that will reduce sources of methylmercury and inorganic mercury. Addressing both will lower methylmercury levels in fish more quickly than focusing only on inorganic mercury. Because health concerns exist now, the proposed Basin Plan amendments also contain requirements for an Exposure Reduction Program, to be conducted with consumers of Delta fish to reduce their mercury exposure while source reductions are occurring.

The State Water Resources Control Board Resolution 2005-0060 directs the San Francisco Bay and Central Valley Regional Boards to “investigate ways, consistent with their regulatory authority, to address public health impacts of mercury in San Francisco Bay/Delta fish, including activities that reduce actual and potential exposure of and mitigate health impacts to those people and communities most likely to be effected by mercury in San Francisco Bay-Delta caught fish, such as subsistence fishers and their families.” An obvious question that is relevant here is what actual activities is the Regional Board going to take to immediately reduce actual and potential exposure among subsistence fishers, considering that the exposure and concomitant health impacts are being felt right now.

R-200: During development of the Delta TMDL, the Central Valley Water Board has provided small amounts of funding to entities working in the Delta to gather fish consumption information, develop education materials, and conduct outreach. In 2007, outreach funding supported a project conducted by the California Department of Public Health and a Sacramento low-income health clinic in which pregnant women were interviewed regarding their fish consumption. Clients who reported frequent fish consumption were tested for mercury levels in blood and received individual, follow-up guidance on lowering mercury in their diet.

R-201: The draft Basin Plan Amendments describe an exposure reduction program that would begin as soon as the Amendment is approved by the State and USEPA. The proposed Amendment would require methylmercury dischargers in the Delta and Yolo Bypass (including large NPDES facilities and urban storm water agencies and any agency proposing new wetland projects in the Delta and Yolo Bypass) to develop and implement effective programs to reduce mercury related risks and quantify risk reductions resulting from the risk reduction activities. The text in the February 2010 Basin Plan amendments was developed with input from community-based organizations that represent fish consumers and environmental justice advocates. Note that following discussions with stakeholders, staff added this text to the Exposure Reduction Program section, “The Exposure Reduction Program is not intended to replace timely reduction of mercury and methylmercury in Delta waters”.

4) It is questionable whether or not convincing people to eat less fish is a legitimate pollution control or pollution control impact activity under the Clean Water Act and this question deserves more investigation. What is clear is that the approaches taken so far are not as effective in changing fish consumption behavior as would be needed to count as risk or exposure management. If these activities are neither legal nor effective, it is worth asking why they are included in the TMDL at all. The Delta Consumption Study asked questions about risk management and reduction from a behavior and communication point of view. Our findings suggest that, despite many years of warnings, most people are unaware of fish advisories and how to follow them and are consuming large amounts of mercury (Figure 3). Most people interviewed had little or no awareness of advisories about safe fish eating. Those who were most aware also had significantly higher fish consumption rates ($P < 0.05$) than those who were unaware (Appendix A). This paradox may be explained by the likelihood that those fishing most often are going to be most aware of ALL fish-related information.

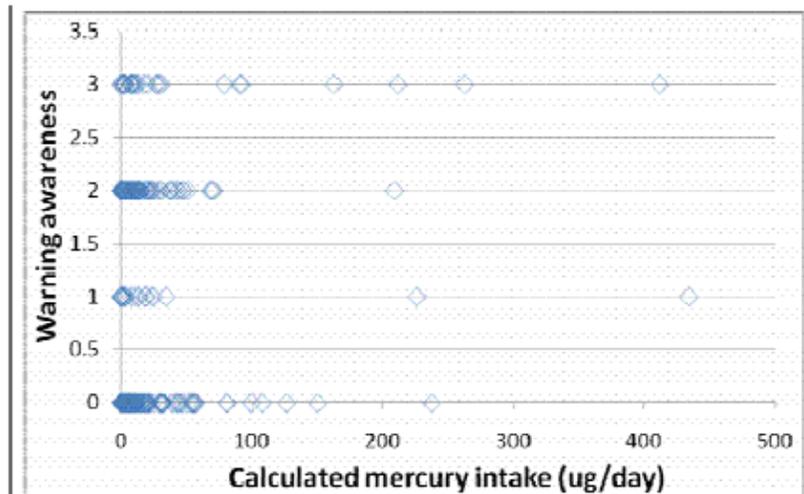


Figure 3 Awareness of warnings about fish consumption compared to mercury intake rate.

R-202: Staff agrees that an Exposure Reduction Program is not a pollution control activity as envisioned by the Clean Water Act or the Porter Cologne Water Quality Control Act. The draft Basin Plan amendments contain inorganic and methylmercury source reduction requirements that are the pollution control activities for reducing levels of methylmercury in fish. However, implementation of source controls and actual reductions in fish mercury levels will take time. Staff proposed the Exposure Reduction Program component of the draft Basin Plan amendments as a way to reduce harm to consumers while fish mercury levels are declining. Staff acknowledges that effective exposure reduction activities with fish consumers may need to go beyond advisories; the proposed program allows for this approach.

The obvious implication of this finding is that anglers and others eating locally-caught fish are not aware of warnings and advisories about fish-eating. This may be for a variety of possible reasons, some of which can be investigated. One that we looked at was the pathways that people eating fish use for receiving health information. We found that direct government sponsored pathways are not described as the ways people receive health information (Figure 4). The most common pathways are medical providers, mass media, and friends/community, with variation in preferences among ethnicities. This suggests that risk communication needs to occur through community-relevant pathways if the state (Regional Board, OEHHA) expects that actual communication will occur. In our collaboration that supports the Delta Consumption Study, the community organizations use technical information from partners (UC Davis) and the state in their own versions of communicating (ethnic radio, meetings). This has been effective because the organizations have taken ownership and speak with the cultural and linguistic voices of the community. This ultimately is the way to pursue communication with Delta and other anglers about risk – by supporting community service organizations who actually know their communities, not state agencies who have a steep and long learning curve.

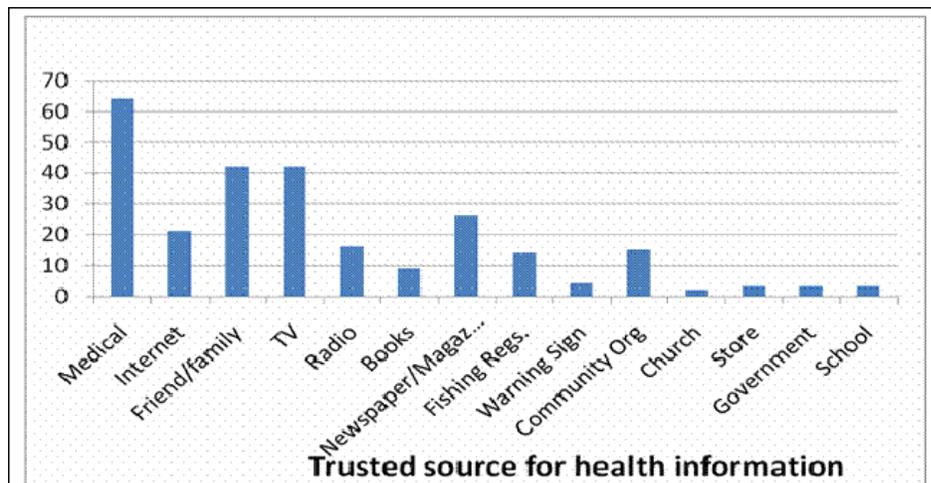


Figure 4 Trusted sources of health information among anglers and community members eating fish.

R-203: Staff appreciates this information. From the document, “Community-Based Strategies to Reduce Mercury Exposure in Delta Fishing Communities”, that you and colleagues wrote for the Central Valley Water Board, staff also understands that the best risk management occurs when anglers and community members are fully involved in decision-making, planning and execution of activities. Staff will work to keep this message in front of staff, other stakeholders, and the Board as we move forward with the TMDL and development of exposure reduction actions.

12. People for Children's Health & Environmental Justice

Letter date: 21 April 2008

From: LaDonna Williams, Executive Director, People for Children's Health & Environmental Justice

Thank you for the opportunity to share our views on the proposed methylmercury TMDL for the Delta. People for Children's Health & Environmental Justice wishes to acknowledge the Regional Board Staff's hard work on this plan and approve of their focus on methylmercury as a means of protecting public health and the environment.

R-204: Staff believes that addressing sources of methylmercury as well as inorganic mercury will lower methylmercury levels in fish more quickly than focusing only on inorganic mercury. Staff will continue to support this position through further discussions of the mercury TMDL program with stakeholders.

People for Children's Health and Environmental Justice is a grassroots, environmental justice organization based in the Bay Area. We serve low-moderate income communities of color. Our mission is to safeguard our communities' basic human right to a safe and toxic-free environment that includes the water we drink and fish that is regularly eaten. Many people in our community fish regularly and often consume higher levels of Delta fish than is considered safe due to methylmercury and other contaminants. We believe that they have the right to fish and consume their catch, whether for cultural, recreational, or economic reasons, without risking their families' health and safety. While we recognize that addressing the mercury problem in the Delta can be complex, we believe that it is the responsibility of the Board to ensure that we do all we can to reduce methylmercury in the watershed in as rapid and complete a manner as possible.

We are seriously concerned that the proposed plan will not adequately protect our community for the following reasons:

- Staff recommends a fish tissue target that will allow people to only eat popular species of locally caught fish once a week, disregarding the fact that many in the Delta's diverse population consume significantly higher levels as a major part of their diet. Such a limited goal will only put our families at continued risk.**
- The TMDL delays taking action to reduce methylmercury levels for 8 years while more studies are done, despite the fact that people, especially those in disadvantaged communities or communities of color, are being affected today.**
- While Staff appropriately includes exposure reduction language from State Board Resolution 2005-0060, the implementation and program evaluation requirements focus on risk communication and do not adequately address mitigating health impacts from mercury contamination or actions to reduce actual exposure.**

We believe these problems can be corrected. Specifically we recommend that:

- 1. The Board adopt a fish tissue objective that will better protect subsistence fishers and their families. Staff's Alternative 5 would allow 4 or 5 meals a week, and comes closer to what is happening in many households. We believe that as research continues in the Delta, this goal can be achieved.**

R-205: Staff recognizes that there are people who eat more than one meal per week of Delta fish. The Delta mercury control program includes an exposure reduction component to protect consumers while methylmercury levels in fish are lowered. This component will also be

useful to people who have high consumption rates of Delta fish. Staff evaluated multiple consumption scenarios in the Delta mercury TMDL report and provided four consumption rate alternatives for the Board to consider in the Basin Plan Amendment staff report. Staff's recommended water quality objectives to protect people are based on consumption of eight ounces (one meal) of a mix of trophic level 3 (e.g., bluegill, carp, crayfish, and salmon) and trophic level 4 (e.g., sturgeon, bass, and catfish) fish. If people eat mainly Delta fish species with low levels of methylmercury, they can safely eat more than one meal per week. OEHHA identified some Delta fish and shellfish that may safely be eaten at three servings per week right now. A goal of the TMDL is to reduce methylmercury levels so that the fish that are now highest in mercury may be safely eaten at least once per week. Note that although the above text speaks generally of "people eating Delta fish", the proposed fish tissue objectives are based on levels necessary to protect sensitive groups (pregnant and nursing women and young children). In its advisories, OEHHA allows non-sensitive groups (women who are not pregnant, nursing, or intending to become pregnant and men) to eat three times as much fish as the sensitive groups.

R-206: Staff agrees that the water quality objectives should be as protective as possible. However, the USEPA requires that staff show that the TMDL has a "reasonable assurance" of being achieved. Staff believes that the water quality objectives based on the one meal/week of trophic level 3 and 4 fish will be met but that lower objectives may not be reached. Staff considered possible Delta fish tissue objectives with respect to a survey of mercury concentrations in fish from 626 sites in 12 western states, including areas not affected by mercury and gold mining (Environmental Science and Technology 2007, vol 41 pg 58-65). Mercury levels in piscivorous fish (mainly trophic level 4) exceeded 0.24 mg/kg in 70% of the stream and river lengths surveyed; levels exceeded 0.05 mg/kg in all stream and river lengths tested. These data suggest that an objective of 0.05 mg/kg, which corresponds to 4-5 fish meals per week, likely would not be achieved in the Delta because it is not observed even in pristine streams.

R-207: The draft Basin Plan amendments require that the Board reconsider the Delta mercury control program, including objectives, after Phase 1 study control information is available. Following discussions during the stakeholder process, staff added to the February 2010 draft Basin Plan amendments this statement: "The long-term goal of the mercury program is to enable people to safely eat four to five meals per week of Delta fish".

2. Sources of methyl and elemental mercury should be required to begin reducing their loads now, based on current knowledge. An adaptive management plan would allow such strategies to be improved as research and monitoring provides more information.

R-208: Staff agrees that actual mercury reductions should not be delayed. The draft Basin Plan amendments contain specific, total mercury control requirements that must be implemented at the beginning of the program for wastewater treatment, urban storm water, and dredging discharges. In order to be successful at controlling sources of methylmercury, though, staff believes that the studies proposed for Phase 1 are necessary. The Phase 1 methylmercury studies will refine load estimates for particular sources and source types (e.g., loads from various kinds of wetlands) and identify effective management practices to control methylmercury. Previous studies allowed staff to identify source categories and estimate methylmercury and total mercury loads, but didn't provide specific information for methylmercury control from various types of sources. Staff's intent is to allow adequate time for effective studies, but not to allow studies to unnecessarily delay improvements if management practices become obvious. The proposed Basin Plan amendments state that during Phase 1,

all dischargers should implement methylmercury management measures that are reasonable and feasible.

R-209: Staff agrees with stakeholders that the Delta methylmercury control program should incorporate adaptive management. The proposed Basin Plan amendments call for the Delta mercury control program to be adaptively managed. A key step in adaptive management, staff and the Board will review the entire program at the end of Phase 1, about 8 years.

- 3. Exposure reduction language should be expanded to include “Coordination with affected communities to develop and implement exposure management programs that meet their particular needs, possibly including providing access to fish with less mercury or other protein sources and supporting or funding programs which address community health problems exacerbated by consumption of mercury in fish”. Furthermore, evaluation of exposure reduction programs should include reporting on such actions.**

The Regional Board has the opportunity to ensure that this TMDL puts the interests of environmental justice and our most impacted communities first. As residents of the Delta region, we believe this is the only way we can be assured that our precious water resources are cleaned up and that our people will live in a healthy and safe environment.

R-210: The draft Basin Plan Amendments require that dischargers work with affected communities and public health agencies to develop and implement an exposure reduction program to reduce mercury exposure to people who eat Delta fish. Staff recognizes that community involvement is crucial. Funded by the Central Valley Water Board, staff of the UC Davis Department of Environmental Science and Policy and the Southeast Asian Assistance Center developed a report, “Community-Based Strategies to Reduce Mercury Exposure in Delta Fishing Communities”, which clearly points out the needs and benefits of including community organizations and fish-consuming residents.

R-211: The draft Basin Plan amendments do not identify particular exposure reduction activities. As recommended by the UC Davis report, affected communities should be given opportunities to identify their preferred risk management activities when the Delta TMDL’s exposure reduction program begins, after adoption of the Basin Plan amendment. The Exposure Reduction Program can encompass activities for reducing mercury exposure that go beyond public outreach and education. To ensure a broad interpretation of possible activities, the proposed Basin Plan amendment section is titled “Exposure Reduction”, instead of “Public Outreach”. The section lists objectives for the exposure reduction program, including “reduce actual and potential mercury exposure of Delta fish consumers most likely affected by mercury” and “develop and implement community-driven activities to reduce mercury exposure”.

R-212: If an affected community determines that providing access to other protein sources is needed to enable their subsistence fishers to reduce their mercury exposure, the current draft Basin Plan amendment language would allow this activity. Board staff recommends that such an activity be assisted by local and/or State agencies and other entities with expertise in nutrition education and supplementation.

13. Sacramento County Regional Sanitation District (9 April 2008)

Letter date: 9 April 2008

From: Mary K. Snyder, District Engineer, Sacramento County Regional Sanitation District

Since the March 2007 Workshop, the District has had several meetings with your staff and we appreciate your staff's efforts to meet with the District, particularly those of your Executive Officer and Assistant Executive Officer in devoting their attention and energies to keep the parties talking. Unfortunately, *very little* has changed from the February 2007 version of the TMDL, despite substantial stakeholder opposition and significant concerns raised by Regional Board Members at the March 2007 Workshop. The District continues to have significant concerns about the basic premises and approach to regulating mercury in the Delta as outlined in the February 2008 draft TMDL. The District's key concerns with the Delta Mercury TMDL are listed below; a more detailed discussion of each of these issues follows this cover letter.

R-213: Staff provided brief responses to each bulleted concern below and more detailed responses in the following pages.

- **The proposed Delta Mercury TMDL will not control the most significant sources of methylmercury (open waters and tributaries) because they are not assigned to any responsible party - - reduction of those sources is the responsibility of the State of California.**

R-214: To address this concern, the Delta TMDL methylmercury allocation strategy was adjusted since the April 2008 hearing meeting to incorporate the same percent reductions required for open-water habitat in all Delta/Yolo Bypass subareas as are required for other point and nonpoint sources that discharge to those subareas (rather than setting open water allocations equal to existing average annual methylmercury loads, as was done in the February 2008 draft report). In addition, the February 2010 draft Basin Plan amendments now includes language that explicitly requires state and federal agencies whose projects affect the transport of mercury and the production and transport of methylmercury through the Yolo Bypass and Delta or manage open water areas in the Yolo Bypass and Delta (including but not limited to the Department of Water Resources, State Lands Commission, Central Valley Flood Protection Board, U.S. Army Corps of Engineers, and U.S. Bureau of Reclamation) to conduct Phase 1 methylmercury control studies. Also, the draft Basin Plan amendments now include new text that specifies dates during Phase 1 by which the Central Valley Water Board commits to developing mercury control programs for the major tributary inputs to the Delta (American, Cosumnes, Feather, Mokelumne Sacramento, and San Joaquin Rivers, and Marsh, Morrison and Putah Creeks).

- **The Regional Board should re-think its approach to focusing primarily on methylmercury, and instead move forward with Total Mercury control measures during Phase I.**

R-215: The February 2010 draft Basin Plan amendments (BPA) specify an adaptive, phased approach to implementing the Delta mercury control program that focuses on conducting methylmercury control studies and implementing total mercury control measures during Phase 1. Implementation of total mercury control measures may be one means of controlling methylmercury.

R-216: Staff's rationale for their recommended strategy was summarized and discussed in the April 2008 hearing meeting and in the follow-up document, "Staff's Initial Responses to Board and Stakeholder Questions and Comments at the April 2008 Hearing"⁴⁰ (see item A-1, pages 3 through 12).

- **The 0.06 ng/L water concentration "goal" should be removed; it is redundant, unnecessary and premature until the Phase I methylmercury control studies are completed. The proposed fish tissue objectives are the appropriate endpoint for the TMDL.**

R-217: Mention of the 0.06 ng/l goal for methylmercury in ambient Delta waters was removed from the draft Basin Plan amendments but retained in the supporting staff reports. Additional discussion is provided on this topic in the following pages.

- **Offset projects, specifically SRCSD's pilot offset project will not occur under the current draft TMDL. The current focus on methylmercury load reductions prevents interested parties from pursuing Total Mercury removal projects. A mechanism must be in place by which the District can be assured to receive a reasonable credit for its offset project.**

R-218: The February 2010 draft Basin Plan amendments contain guidance for developing Phase 1 pilot offset projects and a long-term offset program updated since the February 2008 version to reflect additional input from SRCSD, CVCWA and other stakeholders during the formal stakeholder process after the April 2008 hearing meeting. In particular, the updated BPA contains the following language, "Offset credits should be available upon generation (i.e., after an offset project is implemented) and last long enough (i.e., not expire quickly) to encourage feasible projects." Stakeholders, including Board staff, have committed to developing a more detailed credit strategy during Phase 1 of the proposed control program. In addition, the updated BPA would not require implementation of methylmercury controls to achieve the proposed allocations until after the Board has developed control programs for the major tributary inputs, considered the adoption of an offset program, and completed the Phase 1 Program Review.

The District appreciates the efforts that the Regional Board and its staff have devoted to address mercury impairment of the Delta, and stands ready to do its part to help. We fundamentally believe it is time for the Regional Board to reassess the staff's intended implementation plan. We believe the suggestions contained herein, along with those addressed in the "Coordinated Stakeholders Group" letter of April 9, 2008, would be a good starting point from which to make the necessary changes to the Delta Mercury TMDL.

Thank you for the opportunity to provide these comments.

R-219: Please refer to Board staff responses to the 9 April 2008 letter from "3. California Rice Commission, California Waterfowl Association, Central Valley Clean Water Association, City of Sacramento," provided earlier in this document.

⁴⁰ Available at: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/stakeholder_meetings/25nov08_hearing_rtc.pdf

Attachment - Ongoing Concerns with Delta Mercury TMDL

(1) **The Delta Mercury TMDL Has NO Chance of Controlling the Most Significant Sources of Mercury.** A close look at the current Delta Mercury TMDL reveals that the Regional Board staff has no idea how the most significant sources of mercury loading to the Delta will be controlled. The most significant sources of Methylmercury (and Total Mercury) loadings, per the current Delta Mercury TMDL, are uncontrollable, largely comprised of in-Delta and upper watershed sediment sources that are present in open water and wetland areas of the Delta and major tributaries. As indicated from the attached tables and pie-chart graphic, fully more than 75% of all suspected Methylmercury loads to the Delta come from these open water and tributary sources - - and none of these sources are assigned to any party for reduction. In most cases, the “solution” is future adoption of various TMDLs for these independent tributaries and waterways. As such, the current Delta TMDL provides no real plan for controlling these upper-watershed mercury loadings from open waterways.

The bottom line is that the major sources of mercury loads to the Delta are “legacy” – related to gold mining going back to 1849. The sources of this “legacy” mercury are sediments in Waters of the State of California. It would seem appropriate that the State of California be allocated responsibility for this 75% portion of the identified methylmercury loading to the Delta.

R-220: Per the TMDL Report, about 36% of all methylmercury loading to the Delta comes from wetlands and open-water areas within the Delta and Yolo Bypass, and about 58% comes from tributary inputs. Based on the best available science (documented in the February 2010 draft BPA and TMDL staff reports), staff expects methylmercury inputs from wetlands in the Delta and its tributary watersheds to decrease as methylmercury management practices are implemented at the wetlands. As noted in Chapter 3 of the TMDL Report, even though much of the research has found that wetlands often act as sources of methylmercury, recent data indicate that some wetlands are overall less productive of methylmercury or even net methylmercury sinks (that is, more methylmercury enters the wetlands than leaves). These patterns indicate that it will likely be feasible to control methylmercury from some wetland sources through design, management, and control options. Control studies have already begun to evaluate potential methylmercury management practices at wetlands in the Yolo Bypass. More methylmercury control studies would take place during Phase 1, as proposed by the draft BPA.

R-221: Also, staff expects methylmercury inputs from wetlands and open-water areas in the Delta and its tributary watersheds to decrease as mine-related and in-channel control actions take place in the watersheds to reduce the amount of mercury-contaminated sediment transported to the open-water and wetland areas in the watersheds and the Delta/Yolo Bypass. As described in Chapter 3 of the TMDL Report, the amount of inorganic mercury present in the sediment is a factor important in net methylmercury production. Methylmercury production is a positive linear function of the inorganic mercury content of sediment; inorganic mercury load reductions elsewhere have resulted in decreases in water and fish tissue methylmercury concentrations

R-222: Based on input from stakeholders before and after the April 2008 hearing meeting, several key changes were made to the draft BPA that address SRCSD’s concerns. First, new text was added to the draft BPA that specifies dates during Phase 1 by which the Central Valley Water Board commits to developing mercury control programs for the major tributary inputs to the Delta (American, Cosumnes, Feather, Mokelumne Sacramento, and San Joaquin Rivers, and Marsh, Morrison and Putah Creeks).

R-223: In addition, to better recognize that methylmercury is an environmental legacy of state and federal concern, the TMDL allocation strategy was adjusted since the April 2008 hearing meeting to incorporate the same percent reductions required for open-water habitat in all Delta/Yolo Bypass subareas as are required for other point and nonpoint sources that discharge to those subareas (rather than setting open water allocations equal to existing average annual methylmercury loads, as was done in the February 2008 draft report). In addition, the February 2010 draft Basin Plan amendments now include language that explicitly requires state and federal agencies whose projects affect the transport of mercury and the production and transport of methylmercury through the Yolo Bypass and Delta or manage open water areas in the Yolo Bypass and Delta (including but not limited to the Department of Water Resources, State Lands Commission, Central Valley Flood Protection Board, U.S. Army Corps of Engineers, and U.S. Bureau of Reclamation) to conduct Phase 1 methylmercury control studies and implement methylmercury reductions as necessary to comply with the open-water allocations.

R-224: Both the February 2008 and February 2010 versions of the draft BPA included methylmercury allocations for the tributary inputs to the Delta/Yolo Bypass and required a reduction of 110 kg/yr of total mercury from the tributary watersheds. The TMDL control programs developed for the upstream watersheds would define allocations and reduction requirements for specific methylmercury and total mercury sources (which include legacy sources) within the tributary watersheds.

(2) At This Time, The Regional Board Should Re-Think Its Approach to Controlling ALL Forms of Mercury Affecting the Delta. Most nationwide efforts to control mercury impairments of surface waters have been focused on Total Mercury management. Even as recently as last year, the State Water Board approved a Mercury TMDL for San Francisco Bay that focuses on Total Mercury, and how to control these sources from affecting Bay fish and other wildlife. The Central Valley Regional Board is the first agency to attempt to manage methylmercury directly (and as a separate constituent, largely decoupled from Total Mercury). And while it is well-accepted that methylmercury is the form of this pollutant that primarily accumulates in fish and wildlife, it is not well-known how to implement projects to specifically control methylmercury at present, or whether such controls will work in the future.

Stated somewhat differently, there are some ideas of potential controls on some point sources of methylmercury, but we really don't have a very good handle on whether such controls are reasonable or effective. No meaningful information exists regarding our ability to control non-point legacy sources of this pollutant, which are the predominant sources of methylmercury. The Regional Board Members heard much discussion last March about the difficulties in trying to control discharges of methylmercury from wetlands, agricultural lands, and open waterways. The Regional Board also heard last March that traditional point source dischargers (such as POTWs and urban runoff) account for less than 4% of all the methylmercury loading to the Delta.

R-225: Please refer to the previous Board staff responses about the potential controllability of nonpoint sources and the responsibility assigned to state and federal agencies by the February 2010 draft BPA.

R-226: Local and nationwide studies by scientific experts show that the concentration of methylmercury in water is the most important, single factor in determining how much methylmercury is in fish, and that the most direct way to reduce methylmercury in fish is to reduce the concentration of methylmercury in water (please refer to the TMDL Report for more discussion on this topic). As described in the TMDL Report, the Delta-specific mathematical

relationship between methylmercury in water and methylmercury in fish indicates that the concentration of methylmercury in the water explains more than 90% of the methylmercury concentration in fish. This is a very significant statistical relationship. The Water Boards have incorporated similar science in other TMDL control programs. The Central Valley Water Board adopted a methylmercury TMDL for Cache Creek and its tributaries and the San Francisco Bay Water Board staff recently adopted a TMDL implementation plan for the Guadalupe River watershed that incorporates a methylmercury linkage and methylmercury allocations for reservoirs.⁴¹ The Santa Clara Valley Water District's pilot project to reduce methylmercury in Lake Almaden in the Guadalupe Watershed has shown very positive results.⁴² In addition, the San Francisco Bay's mercury TMDL control program requires San Francisco Bay dischargers to address methylmercury, in particular:

- NPDES dischargers, dredging projects, and wetland projects are required to monitor methylmercury and do methylmercury studies.
- Dredging and disposal operations are required to demonstrate that their activities do not increase the bioavailability of mercury.
- Wetland restoration projects are required to be designed and operated to minimize methylmercury production and result in no net increase in mercury or methylmercury loads to San Francisco Bay.

R-227: Also, as noted in their April 2008 comments, USEPA scientists concluded that methylmercury allocations for the Delta TMDL are reasonable.

R-228: The tributaries provide about 98% of the total mercury loads to the Delta.

R-229: Staff and the District agree that the Delta mercury control program should include total mercury reductions and studies to identify the most feasible ways to control methylmercury. Staff and the District seem to differ with respect to when methylmercury allocations should be assigned. The District stated that a methylmercury TMDL for the Delta is acceptable. In order to satisfy federal requirements, the TMDL must contain allocations. Staff proposed a plan that contains allocations for the form of mercury most directly related to the beneficial use impairment.

R-230: It is because of concerns such as those expressed by SRCSD above and other stakeholders (e.g., the concern that methylmercury controls would be required before the science of methylmercury control is ready) that the February 2008 draft Basin Plan amendments incorporated an adaptive, phased approach to implementing the Delta mercury control program that focused on conducting methylmercury control studies and implementing total mercury control measures during Phase 1, with a long compliance schedule for the methylmercury allocations (i.e., a final compliance date of 2030) that would not begin until Phase 2 of the

⁴¹ See the following website for Resolution R2-2008-0089 (October 2008), the adopted Basin Plan Amendment, and the final staff report by Carrie Austin and others (September 2008): http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/guadaluperivermercurytmdl.shtml

⁴² Drury, D. 2007. Santa Clara Valley Water District. Reduction of methyl mercury concentrations in an urban lake using a solar-powered circulator. Presentation at the 2007 Annual International Symposium of the North American Lake Management Society. October. <http://www.nalms.org/Conferences/Orlando/PDF/Orlando2007Program.pdf>

implementation plan. At the April 2008 hearing meeting, staff further responded to comments that the first part of the implementation plan should focus on total mercury by proposing that methylmercury control actions not be required for the purpose of achieving the methylmercury allocations until upstream control programs have been developed. Board staff worked with stakeholders after the April 2008 hearing meeting to develop BPA text that require a Phase 1 Program Review that must take place before implementation of methylmercury controls is required to comply with the proposed methylmercury allocations. The February 2010 draft BPA allows characterization studies to inform and prioritize the Phase 1 control studies (see page BPA-6). Per the revised text in the February 2010 draft BPA, implementation of methylmercury controls to achieve the proposed methylmercury allocations would not be required until the Central Valley Water Board develops TMDL mercury control programs for the major tributaries and completes the Phase 1 Delta Mercury Control Program Review.

Lastly, the Regional Board heard last March something with which few scientists disagree - - that you cannot get methylmercury without the presence of Total Mercury; methylmercury is formed from biological action on Total Mercury.

The question to be asked is, if we don't really know how to control the methylmercury loading to the Delta, and there isn't a realistic expectation of controlling these sources any time soon, shouldn't the Regional Board reconsider its approach to managing Total Mercury in the Delta?

In other words, by focusing efforts on preventing and reducing discharges of Total Mercury to the Delta and its up-watershed tributaries during Phase I of the TMDL, in parallel with methylmercury research work, don't we stand a better chance of reducing overall production and discharges of methylmercury to the Delta? After appropriate studies are completed during Phase I of the TMDL as currently contemplated, the Regional Board, and all stakeholders, will be in a better position to determine what control measures can reasonably and effectively be applied to sources.

SRCSO does not object to the Regional Board moving forward with a methyl-mercury TMDL for the Delta. However, SRCSO does believe that an appropriate *implementation plan* for achieving long-term methylmercury reductions should focus current actions on Total Mercury sources and their removal or remediation. We know that without Total Mercury, one cannot have methylmercury. We know how to remove total mercury. There is no downside to waiting for the science to adequately characterize sources and recommend future control options for methylmercury.

R-231: Staff agrees that the presence of inorganic mercury is needed for methylmercury to be produced, and that it makes sense to focus implementation activities on inorganic (total) mercury reduction efforts while Phase 1 methylmercury studies are conducted. As noted earlier, both the 2008 and 2010 draft BPAs focused implementation actions during Phase 1 on reducing total (inorganic) mercury sources. For example, the February 2010 draft BPA includes performance-based, Phase 1 interim total mercury mass limits for NPDES facilities in the Delta, and a requirement for a 110 kg/yr minimum reduction in total mercury loads from the tributary watersheds, with an emphasis on the watersheds that discharge the most mercury-contaminated sediment to the Delta and Yolo Bypass (e.g., Cache Creek, Feather River, Cosumnes River, and Putah Creek).

R-232: Staff recommends a long-term strategy that would directly address both methylmercury and total mercury sources during Phase 2 because available information indicates that:

- There is adequate science and understanding of methylmercury cycling to have a TMDL based on methylmercury and a phased implementation program based on controlling both methylmercury and total mercury sources.
- A control program that focuses only on inorganic mercury would not reduce fish tissue methylmercury levels as quickly as implementing a program that addresses both inorganic mercury sources and methylmercury sources;
- An inorganic mercury control program likely would not achieve the proposed fish tissue objective in all areas of the Delta; and
- Given that modern point sources and legacy mercury from historic mining activities may comprise only about 35% of inorganic mercury entering the Delta, even if legacy mercury loads and modern point sources could be reduced to zero, we would still need to be concerned about activities in and around the Delta that contribute methylmercury.

R-233: Staff's rationale for their recommended strategy was further summarized and discussed in the April 2008 hearing meeting and in the follow-up document, "Staff's Initial Responses to Board and Stakeholder Questions and Comments at the April 2008 Hearing"⁴³ (see item A-1, pages 3 through 12).

(3) The 0.06 ng/L Water Concentration "Goal" Should Be Removed. At the Mercury TMDL Workshop last March, Regional Board Members heard much testimony about the 0.06 ng/L water concentration "goal" contained in the current version of the Delta TMDL, and had a lively discussion about whether the TMDL should properly focus on water column, sediment or fish tissue as a means of calculating compliance with the TMDL. There are at least five reasons why the 0.06 "goal" should be removed.

R-234: The 0.06 ng/l goal for ambient Delta water has several purposes: it is used to link methylmercury in Delta water to methylmercury in fish; it is used to determine how much methylmercury sources need to be reduced to achieve the proposed fish tissue objective; and, for the February 2008 draft BPA, it was used to determine which methylmercury sources would be required to conduct methylmercury studies. (Note, Board staff incorporated revisions to the February 2010 draft BPA based on input from SRCSD and CVCWA so that the draft BPA now requires control studies for all NPDES facilities in the Delta/Yolo Bypass, not just those that discharge more than 1 mgd with effluent methylmercury concentrations greater than 0.06 ng/l.) The USEPA requires that there be a linkage between the fish methylmercury objective and methylmercury sources. Staff does not recommend that 0.06 ng/l be used as an effluent or receiving water limit.

R-235: Before the February 2008 staff reports were released, staff revised the draft Basin Plan amendment language to include an explanation of how the goal is used in Phase 1, and how the goal will not be used as an effluent limit in permits during Phase 2 unless the Board makes that determination and amends the Basin Plan. However, given comments received before the April 2008 hearing meeting, the revised BPA language did not resolve all concerns on this issue. As a result, at the April 2008 hearing meeting, staff proposed revisions to the draft Basin Plan amendment language to address these concerns. Staff proposed an option to

⁴³ Available at:
http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/stakeholder_meetings/25nov08_hearing_rtc.pdf

remove the references to the 0.06 ng/l ambient water goal in the draft Basin Plan amendments so that Board staff and others do not have the chance to misinterpret the goal as an effluent or receiving water limit. This change was made; the February 2010 draft BPA does not refer to the 0.06 ng/l goal for methylmercury in ambient water. A description of how the goal was used to develop the methylmercury allocations must remain in the staff reports to comply with federal requirements for TMDLs.

First, it is redundant and unnecessary. The point of a TMDL is to establish a load, or mass loading limits, of a given pollutant (particularly bioaccumulative pollutants such as mercury) in order to achieve beneficial uses that are impaired. Imposition of mass limits will lead to actions by regulated sources to reduce loadings of mercury, which is certainly the desired outcome. Imposition of concentration limits would add an additional, unnecessary requirement to reduce concentrations as well as mass loadings. This would force changes in treatment technology at many POTWs, which would greatly reduce the incentive for offset projects by those agencies.

R-236: As noted earlier, Board staff does not recommend that 0.06 ng/l be used as an effluent or receiving water limit, and removed it from the draft BPA to help avoid confusion and lessen the fear that it could be accidentally and improperly used as an effluent limit. Also, in response to input from stakeholders before and after the April 2008 hearing meeting, the draft BPA language no longer contains performance-based, Phase 1 interim effluent methylmercury concentration limits; instead the February 2010 contains performance-based, Phase 1 interim effluent total mercury mass limits.

Second, focusing on fish tissue is not only a better indicator of whether controls on all loading sources are working, it strikes at the heart of the reason that the Delta was listed as impaired by mercury - - fish consumption impacts. The District continues to support the staff recommendation relative to establishing a fish tissue standard against which future mercury reduction and removal actions can be assessed.

R-237: To clarify, both the 2008 and 2010 draft BPAs' "Surveillance and Monitoring" language include fish monitoring requirements for Delta and Yolo Bypass waterways to assess compliance with the proposed fish tissue methylmercury objectives. Because point and nonpoint sources dischargers discharge water (not fish), the load and waste load allocations are based on methylmercury mass in water, and compliance with the allocations must be assessed by discharge water sampling.

Third, the 0.06 ng/L "goal" is something that probably cannot be met by a number of POTWs that discharge to the Delta, short of tearing down and rebuilding from scratch their entire biological treatment processes. If this is the approach that the Regional Board favors, then at least the Regional Board must take responsibility not only for the enormous cost to ratepayers and taxpayers (current estimates range from between \$500 Million and One Billion, depending on ultimate treatment technologies mandated) but also for the colossal amount of energy that will be required to operate those systems, and the attendant production of hundreds of tons of greenhouse gas emissions.

R-238: Board staff expects that few if any facilities would need to rebuild their treatment systems from scratch to comply with their methylmercury allocations for several reasons:

- Of the 67 facilities in the Delta source region for which effluent methylmercury concentration data were available (Bosworth *et al.*, 2010⁴⁴), 14 facilities had average effluent methylmercury levels that approached or were less than analytical method detection limits (e.g., less than 0.03 ng/l) and 24 facilities had effluent methylmercury levels equal to or less than the proposed implementation goal (0.06 ng/l) for ambient water, indicating that about half would likely not need to implement treatments to comply with methylmercury allocations or other limits.
- As evidenced by the recent effluent monitoring results for the SRCSD and Stockton WWTPs, by focusing on reducing inorganic mercury and other pollutants in their discharges, some facilities may be able to achieve the methylmercury allocations proposed in the February 2010 draft BPA. For example:
 - The 2001-2007 effluent methylmercury data for the SRCSD Sacramento River WWTP illustrate a marked decrease in effluent methylmercury and total mercury concentrations with time (Bosworth *et al.*, 2010). The decline indicates that it is possible for a given WWTP's effluent methylmercury to decrease without implementing methylmercury-specific treatments. During the April 2008 Board hearing meeting for the Delta mercury control program, the SRCSD District Engineer testified that implementation of the Be Mercury Free Program to reduce inorganic mercury sources to SRCSD's WWTP resulted in reductions in both inorganic mercury and methylmercury discharges from the WWTP. Board staff's calculations indicate that the SRCSD WWTP's average annual methylmercury discharge during recent years (2005-2007, ~95 g/yr) comes very close to meeting staff's proposed allocation for the SRCSD WWTP (89 g/yr).
 - Upgrades to the City of Stockton WWTP completed in September 2006 to meet new ammonia effluent limits and Title 22 (or equivalent) tertiary requirements appear to have led to substantial reductions in total mercury and methylmercury as well as ammonia. A comparison of WWTP effluent ammonia, total mercury and methylmercury data collected before (August 2004-July 2005) and after (January-July 2009) the treatment plant upgrade indicates that since the WWTP was upgraded, average effluent ammonia concentrations decreased by 95%, average inorganic mercury concentrations decreased by 83%, and average methylmercury concentrations decreased by 91%. (See Section 6.2.3.1 in Chapter 6 of the February 2010 TMDL Report for more discussion.) Given the proposed methylmercury waste load allocation for the Stockton WWTP entails a 64% decrease from the water year 2005 load, it is likely that the Stockton WWTP discharges would comply with the proposed allocation if the decrease in its effluent methylmercury concentrations observed in January-July 2009 continue.

R-239: Eight WWTPs in the Delta/Yolo Bypass have methylmercury allocations that require methylmercury reductions (see Table 8.4 in the TMDL Report). One facility performs filtration (Stockton WWTP), four perform secondary clarification (Manteca, Rio Vista, Tracy and SRCSD Sacramento River WWTPs), and one makes use of lemna and oxidation ponds (Davis WWTP). The Sacramento Combined WWTP, which discharges primarily stormwater runoff

⁴⁴ Bosworth, D.H., S.J. Louie, M.L. Wood, D.J. Little, and H. Kulesza. 2010. A Review of Methylmercury Discharges from NPDES Facilities in California's Central Valley. California Regional Water Quality Control Board, Central Valley Region, Final Staff Report. March 2010. Available at: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/other_technical_reports/

during major storm events, uses primary (settling) treatment with disinfection (Table C.22). None of the facilities perform ultraviolet radiation, which could help reduce effluent methylmercury levels; however, some may be required to do so in the future for the reduction of other pollutants (e.g. disinfection). Phase 1 methylmercury control studies need to be completed to determine which types of treatment will reduce methylmercury discharges from these facilities. However, it is possible that implementation of pollutant minimization programs already required by existing NPDES permits could enable partial or even full compliance with the methylmercury allocations, or that modifications could be made to improve pollutant minimization efforts, that would be substantially more cost-effective than implementing new treatment processes. Also, the Manteca, Tracy and Davis WWTPs are expected to begin tertiary treatments by 2015; tertiary treatment, especially if combined with implementation of a mercury-specific pollutant minimization program, could enable compliance with their methylmercury allocations. As noted earlier, initial monitoring results after recent plant upgrades indicate that the Stockton WWTP may already be close to, if not already, meeting its proposed methylmercury allocation. In addition, the SRCSD WWTP's annual effluent methylmercury load decreased between 2001 and 2006 such that it comes within 10% of achieving the proposed allocation (Bosworth *et al.*, 2008). (See additional discussion on this topic in Section C of Appendix C of the February 2010 draft BPA Staff Report.)

R-240: Also, the range of costs estimates that SRCSD provided – “from between \$500 Million and One Billion, depending on ultimate treatment technologies mandated” – are the estimated costs for implementing “Microfiltration” and “Reverse Osmosis” at the SRCSD Sacramento River WWTP, the two most expensive options of the four advanced treatment options identified by Carollo Engineers for removing chlorpyrifos, diazinon, lindane, and mercury (see Carollo Engineers’ 2005 SRCSD Treatment Feasibility Study,⁴⁵ Table 11). (Note, the Central Valley Water Board does not specify or mandate the actual means of compliance by which responsible entities [e.g., dischargers, government, nonprofit, and private agencies, or other persons responsible for complying with total mercury and/or methylmercury control requirements] choose to comply with the proposed allocations in the draft Basin Plan amendments or any other permit effluent limits.) As discussed in the previous staff responses, it may be possible that treatments designed to reduce other pollutants could also reduce methylmercury. Board staff does not anticipate that SRCSD or any other discharger would need to implement microfiltration or reverse osmosis solely for the purpose of reducing effluent methylmercury levels. Also, advanced treatment may not be required to reduce effluent methylmercury levels. Not all secondary treatment facilities have elevated effluent methylmercury concentrations; for example, the San Jose/Santa Clara WWTP in the San Francisco Bay area makes use of a single-stage activated sludge process and has a secondary effluent methylmercury concentration of 0.04 ng/l.⁴⁶ In addition, expensive upgrades to facility treatment processes may not be needed if aggressive pollutant minimization programs are implemented and maintained and/or if an effective and legally-viable long-term offset program or other watershed approach to complying with allocations is developed during Phase 1

R-241: The SRCSD Sacramento River WWTP is the largest NPDES-permitted municipal WWTP in the Delta source region. It discharged 160 mgd on average between 2001 and 2006,

⁴⁵ Carollo Engineers. 2005. Sacramento Regional County Sanitation District, Sacramento Regional Wastewater Treatment Plant, NPDES Permit NO. CA 0077682 Provision E.6 Treatment Feasibility Studies, Final. Carollo Engineers. Walnut Creek, CA. March 2005.

⁴⁶ SJ/SC. 2007. *San Jose/Santa Clara Water Pollution Control Plant Mercury Fate and Transport Study*. Environmental Services Department, SJ/SC Water Pollution Control Plant. San Jose, CA. March 2007.

compared to 36 mgd from the City of Stockton WWTP, which is the second largest NPDES-permitted municipal WWTP in the Delta source region (Bosworth *et al.*, 2010, Table 16). [Note, it is not surprising that these are the two largest municipal WWTPs in the Delta source region because the most populous urban areas in the Sacramento and San Joaquin Basins (the Delta's primary source region) – Sacramento in Sacramento County and Stockton in San Joaquin County – are adjacent to and within the Delta (TMDL Report, Figure 6.9; CDOF, 2007⁴⁷]. SRCSD's annual discharge volume (160 mgd for 2001-2006) and average annual methylmercury load (161 g/yr for 2001-2006) accounts for about 49% and 71% of all municipal WWTP discharge volume (326 mgd) and methylmercury (228 g/yr), respectively, in the Sacramento River and San Joaquin River watersheds downstream of major dams (Bosworth *et al.*, 2010, Tables 16, and 36). In addition, it makes use of secondary treatment processes (rather than advanced treatment processes). As a result, it is reasonable to expect that its cost estimate for implementing advanced treatment options greatly exceeds potential costs that could be associated with other facilities implementing advanced treatment or alternative (e.g., offset projects) options to comply with their allocations.

R-242: Staff provided a detailed review of potential costs associated with the implementation of the draft BPA in Appendix C of the draft BPA Staff Report and evaluated potential environmental impacts associated with complying with the proposed methylmercury allocations and other draft BPA requirements in Chapter 7 of the draft BPA Staff Report, including “Greenhouse Gas Emissions” (Section VII in Section 7.3) and “Economic Factors” (Section 7.4). The environmental analysis determined that implementation of the proposed Basin Plan amendments could result in potentially significant impacts to greenhouse gas emissions unless mitigation is incorporated. The staff report summarizes numerous reasonable mitigation methods to reduce potential impacts to greenhouse gases from implementation projects. Implementation projects are expected to have a less than significant impact on greenhouse gas emissions when mitigations are incorporated. Also, Chapter 7 identifies several means by which dischargers can choose to minimize potential economic impacts, including by not limited to:

- Entities responsible for meeting subarea methylmercury allocations collaboratively focus implementation efforts on sources with the most feasible methylmercury reduction measures (i.e., measures that are cost effective and do not have significant environmental impacts) within each subarea; and
- Entities responsible for meeting both waste load and load allocations help develop and participate in an offset program.
- However, mitigation measures lie within the jurisdiction of entities implementing site-specific projects. As noted earlier, Central Valley Water Board does not specify or mandate the actual means of compliance by which responsible entities choose to comply with the proposed allocations in the draft Basin Plan amendments or any other permit effluent limits and as a result, the Central Valley Water Board cannot be certain that entities responsible for implementing site-specific projects will in fact incorporate those mitigation measures identified in Chapter 7 or comparable

⁴⁷ CDOF. 2007. New State Projections Show 25 Million More Californians by 2050; Hispanics to Be State's Majority Ethnic Group by 2042. California Department of Finance (CDOF), Sacramento, California, July 2007. Table 1: County Total Population by Decade. (Updated since May 2004 publication.) Accessed: July 13, 2007. Available at: <http://www.dof.ca.gov/HTML/DEMOGRAP/ReportsPapers/Projections/P1/P1.asp>.

mitigation measures, except for those site-specific projects for which the Board is the “Lead Agency”.⁴⁸

Fourth, despite assurances from Regional Board staff at the March 2007 workshop that the 0.06 “goal” will never find its way into NPDES permits as a *limit*, the current proposed TMDL now states that this goal could be in NPDES permits as an effluent limit in as little as eight (8) years.

R-243: Both the 2008 and 2010 draft BPA Staff Reports included a review of the primary considerations specific to the TMDL and implementation program and options for how to address each of them (see Section 4.2.1 in the February 2010 draft BPA Staff Report). Both draft reports considered a variety of options for how to apportion responsibility to different methylmercury sources, in particular, how to calculate the methylmercury load and wasteload allocations. The evaluation considered how existing and new sources in the Delta and its tributary watersheds with discharge methylmercury concentrations less than the implementation goal (0.06 ng/l) for methylmercury in ambient water may be able to contribute methylmercury loading to the Delta without causing ambient methylmercury concentrations to exceed the proposed implementation goal, and how sources with discharge methylmercury concentrations greater than the implementation goal in the Delta or its tributary watersheds downstream of major dams could cause ambient methylmercury levels in the Delta to exceed the implementation goal.⁴⁹ Both the 2008 and 2010 draft reports considered the option of developing methylmercury allocations for all methylmercury source categories based on an effluent limit equal to the proposed implementation goal (0.06 ng/l). However, for equitability and cost effectiveness reasons, Board staff did not carry this into the alternatives evaluation. Because dilution sources and methylmercury loss factors vary across the Delta, some Delta subareas are less impaired by methylmercury than others. As a result, requiring all sources to be reduced to the implementation goal may be overly onerous. Staff noted in the draft reports that this option may be re-considered at the end of Phase 1 based on the results of the proposed methylmercury control studies and other new information about the extent of impairment and transport of methylmercury throughout the Delta. It would not be reasonable to rule out options before the proposed Phase 1 methylmercury control studies have been completed.

R-244: The February 2008 draft BPA included the following language:

“From [the effective date of this amendment] through [eight years after the effective date of this amendment], the 0.06 ng/l goal will not be used as an effluent limit for discharges with annual average methylmercury effluent concentrations greater than 0.06 ng/l. After [eight years after the effective date of this amendment] the Regional Water Board will reevaluate the 0.06 ng/l methylmercury goal and determine at that time which, if any, effluent limit adjustments are necessary. After [eight years after the effective date of this amendment], the methylmercury goal

⁴⁸ The Central Valley Water Board is the “Lead agency” for site-specific projects when it has the principal responsibility for carrying out or approving a project that may have a significant effect upon the environment.

⁴⁹ Because of the concentration and amount of their discharge relative to the receiving water and other factors, existing individual sources (e.g., a single facility outfall, MS4 outfall or wetland) may or may not result in a measurable increase in the methylmercury concentration of downstream Delta waters. However, the sum of such sources results in measurable increases in fish mercury levels. The same is expected to be true of new methylmercury sources.

of 0.06 ng/l will not be established as an effluent limit in permits unless the Regional Water Board makes that determination and amends the Basin Plan.”

R-245: This language was removed from the draft BPA to avoid confusion.

Fifth, other state and federal agencies may interpret the Central Valley Regional Board’s 0.06 “goal” as the best and latest information on this issue and are likely to turn the “goal” into a statewide water quality standard, which would ultimately be imposed on POTWs as new permit limits outside the direct control of the Central Valley Regional Board.

R-246: The 0.06 ng/l goal for ambient Delta water is based on Delta-specific information and is used to link methylmercury in Delta water to methylmercury in Delta fish in order to determine how much methylmercury sources need to be reduced to achieve the proposed fish tissue objectives specific to the Delta. Because this goal is specific to conditions in the Delta, it would not be appropriate to apply this goal as a statewide water quality standard. Although Central Valley Water Board staff does not have control over the actions of the State Water Board and USEPA, Central Valley Water Board staff is committed to participating in any stakeholder process associated with developing a statewide standard and providing comments to clarify the appropriate use of the goal for ambient Delta water.

In sum, the District believes that putting this water concentration “goal” into the Delta Mercury TMDL is not only problematic and unnecessary for the reasons noted, but it is premature until the Phase I methylmercury control studies are completed and assessed. Staff should see if reduction expectations support the water concentration goal and adaptively manage methylmercury allocations at the end of Phase 1.

R-247: As noted earlier, the goal was removed from the draft BPA language, and additional text was added to clarify the adaptive approach to managing the proposed methylmercury allocations.

(4) Offset Projects Will Not Occur Under the Current Proposal. Last March, Regional Board Members stated their near-unanimous support for the notion of pilot offset projects as a means by which to make early, and real, reductions to the overall loading of mercury in and around the Delta. Moreover, the Regional Board indicated its desire for its staff and the District to work toward developing an appropriate and viable offset project.

SRCS D continues to not only support the offset approach, but remains interested in commencing a pilot offset project to reduce total mercury loadings from the Cache Creek Settling Basin to the Yolo Bypass. While SRCS D and Regional Board staff have met and exchanged ideas about how such an offset project would work and might be credited on the basis of total mercury, unfortunately, it has become clear that the determination of a mutually acceptable credit for methylmercury is not possible. This is largely due to the fact that neither the Regional Board staff nor the District can identify a way to locate or quantify a methylmercury control project.

There are certainly many unknowns regarding the transformation of Total Mercury to Methylmercury and, in some cases, back to Total Mercury. To be sure, trying to develop an appropriate and viable offset approach that tries to bridge the gap between Total and Methylmercury is so complicated that it prevents agreement on an offset credit arrangement. This is another, significant reason for the Regional Board to consider refocusing its Phase I efforts towards the removal of Total Mercury from the system. Doing so will remove this roadblock and create the near-term opportunity for offset projects that will reduce the amount of Total Mercury entering the Delta.

The District stands ready to move forward on a pilot mercury offset project in the Cache Creek Settling Basin that will not only result in substantial Total Mercury being removed from the Delta system, but also help the Regional Board and stakeholders interested in future offset projects by chronicling and assessing the “lessons learned” along the way. A mechanism must be in place by which the District can be assured to receive a reasonable credit for its offset project and the current TMDL does not provide that mechanism.

R-248: As noted earlier, the February 2010 draft Basin Plan amendments contain guidance for developing Phase 1 pilot offset projects and a long-term offset program updated since the February 2008 version to reflect additional input from SRCSD, CVCWA and other stakeholders during the formal stakeholder process after the April 2008 hearing meeting. In particular, the updated BPA contains the following language, “Offset credits should be available upon generation (i.e., after an offset project is implemented) and last long enough (i.e., not expire quickly) to encourage feasible projects.” Stakeholders, including Board staff, have committed to developing a more detailed credit strategy during Phase 1 of the proposed control program. Implementation actions during Phase 1 would focus on the reduction of inorganic (total) mercury. In addition, the updated BPA would not require implementation of methylmercury controls to achieve the proposed allocations until after the Board has developed control programs for the major tributary inputs, considered the adoption of an offset program, and completed the Phase 1 Program Review.

14. Sacramento County Regional Sanitation District (24 April 2008)

Letter date: 24 April 2008

From: Mary K. Snyder, District Engineer, Sacramento County Regional Sanitation District

The District appreciates the opportunity to comment on the proposed “Basin Plan Amendment to Control methyl and Total Mercury in the Sacramento-San Joaquin Delta Estuary (Delta)”. Attached are our detailed comments on the Basin Plan Amendment and the Staff Report. These comments are provided in addition to comments submitted on April 9th, 2008. Please feel free to contact us if you have any questions.

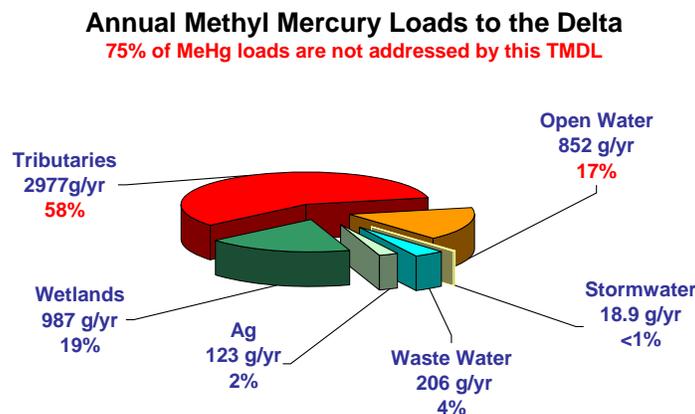
Comments on Draft Basin Plan Amendment

Section: Delta Mercury Control Program (p.BPA-1)

p. BPA-1 to -2, First paragraph second sentence:

Actions are needed in the Delta and upstream tributaries to achieve the fish tissue objectives. The Delta Mercury Control Program includes mercury and methylmercury control requirements for the Delta and some upstream sources. Future upstream control programs are planned for tributaries to the Delta through which control actions will be implemented to meet load allocations for tributary inputs assigned by the Delta control program and to achieve the fish tissue objectives throughout the Delta...Attainment of the methylmercury allocations set forth in this control program is expected to result in achieving the fish tissue objectives.

The potential benefits of “controlling the controllable” are over-stated. Regulated sources of mercury such as municipal wastewater, stormwater and agriculture represent a small fraction of the overall mercury budget. A pie chart easily demonstrates the relative magnitudes of sources identified in the TMDL:



The TMDL implementation plan primarily looks to control these minor sources and leaves the impression that these types of efforts will result in achieving the TMDL fish tissue target. In so doing, the TMDL implementation plan fails to articulate the reality that controlling this small percentage may have little or no impact on actually attaining the TMDL goals. The draft TMDL’s only test for attainability (Staff Report p.18) is a comparison between fish mercury levels in the Delta watershed versus in other (generally lower) Western regional watersheds. Focusing any attention on these permitted sources, while

approximately 60% of the sources are ignored, is misleading to decision makers and ultimately will be ineffective.

The TMDL should (1) describe what those plans are for the tributaries and what sources could be controlled in their watersheds, to guide Phase 1 of the TMDL and (2) initiate during Phase 1 a Use Attainability Analysis to determine if the fish tissue goals are reasonable and achievable and to adjust the fish tissue objective accordingly.

R-249: It was not staff's intent to imply that focusing only on in-Delta sources, or only on wastewater treatment plants, would resolve the Delta mercury impairment. As discussed in staff's responses to CVCWA's comments earlier in this document, point and nonpoint source discharges are assigned an equal percent reduction by the allocations. To address SRCSD and CVCWA concerns, staff and stakeholders developed draft BPA language that would not require implementation of methylmercury management practices identified in Phase 1 for the purposes of achieving methylmercury allocations until the Regional Water Board has completed the Phase 1 Delta Mercury Control Program Review and has developed mercury control programs for the major tributaries.

R-250: In response to this comment and additional stakeholder input during the formal stakeholder process after the April 2008 hearing meeting, the draft BPA was revised to include new text that specifies dates during Phase 1 by which the Central Valley Water Board commits to developing mercury control programs for the major tributary inputs to the Delta (American, Cosumnes, Feather, Mokelumne Sacramento, and San Joaquin Rivers, and Marsh, Morrison and Putah Creeks).

R-251: A Use Attainability Analysis is not possible until the proposed Phase 1 methylmercury control studies have been completed. The adaptive strategies outlined in both the February 2008 and February 2010 draft BPAs were designed to encompass the need for additional tributary source analyses and methylmercury control studies, and to allow the Delta control program and associated fish tissue objectives, linkage and allocations to be modified as new scientific and management information becomes available. This approach was further developed by the formal stakeholder process after the April 2008 hearing meeting and the February 2010 draft Basin Plan amendments now contain more detailed language describing the adaptive management approach as well as more detailed requirements for the Board to conduct a Phase 1 Program Review. During the Phase 1 Program Review, the Central Valley Water Board can consider modifying wasteload allocations and/or fish tissue objectives based on the results of the Phase 1 studies and other new scientific and management information.

R-252: Please see the more detailed responses related to these concerns in Board staff's response to SRCSD's letter dated 9 April 2009.

p. BPA-1 and -2, Phase 2 initiation

From (the effective date of this amendment) through (eight years after the effective date of this amendment), the 0.06 ng/l goal will not be used as an effluent limit for discharges with annual average methylmercury effluent concentrations greater than 0.06 ng/l. After (eight years after the effective date of this amendment) the Regional Water Board will reevaluate the 0.06 ng/l methylmercury goal and determine at that time which, if any, effluent limit adjustments are necessary.

R-253: This language was removed from the draft BPA to avoid confusion.

The Regional Board needs to make and meet specific commitments before Phase 2 of the TMDL is initiated. The following questions remain for us:

⇒ **Will this process be done as a component of Phase 2 of the TMDL or separately?**

R-254: The February 2010 draft Basin Plan amendments now contain more detailed language describing the adaptive management approach as well as more detailed requirements for the Board to conduct a Phase 1 Program Review (after the proposed Phase 1 methylmercury control studies are completed) that must take place before implementation of methylmercury controls is required to comply with the proposed methylmercury allocations. During the Phase 1 Program Review, the Central Valley Water Board can consider modifying wasteload allocations based on the results of the Phase 1 studies and other new scientific and management information. Please see the more detailed responses related to this topic in Board staff's response to SRCSD's letter dated 9 April 2009.

⇒ **Will Phase 2, and particularly this piece about re-evaluating the goal, be subject to CEQA?**

R-255: Yes, and revisions to the Basin Plan (including to the methylmercury allocations and supporting documentation that describe the fish tissue objectives, linkage and goal for ambient Delta water) will be subject to a California Environmental Quality Act (CEQA) environmental analysis.

⇒ **Which requirements will apply based strictly on this Basin Plan Amendment and which will apply subsequent to approval of the TMDL (that is, following State and federal review and approval)?**

R-256: Requirements within the proposed Basin Plan amendments will apply after USEPA approval. Language indicating that this is the "Effective Date" of the Delta mercury control program was added to the February 2010 draft BPA to address SRCSD's question.

Specific commitments should include:

- **Development of an overall strategy in Phase 1 for completing over 45 mercury TMDLs for multiple water bodies (based on the 2006 303(d) list for Region 5) and significant progress in completing them.**

R-257: To address the intent of this comment, Board staff worked with SRCSD and other stakeholders during the formal stakeholder process following the April 2008 hearing meeting to develop new text for the draft Basin Plan amendments that specifies dates during Phase 1 by which the Central Valley Water Board commits to developing mercury control programs for the major tributary inputs to the Delta (American, Cosumnes, Feather, Mokelumne Sacramento, and San Joaquin Rivers, and Marsh, Morrison and Putah Creeks). The draft BPA now contains language that explicitly states that the Board will develop control programs for these tributaries before dischargers in the Delta/Yolo Bypass are required to implement methylmercury controls during Phase 2 to comply with the methylmercury allocations specified in the Delta mercury control program.

- **Conduct of a Use Attainability Analysis in Phase 1 to determine if the fish tissue goals are reasonable and achievable. Adjustment of the fish tissue objective, accordingly.**

R-258: As noted earlier, a Use Attainability Analysis is not possible until the proposed Phase 1 methylmercury control studies have been completed. The February 2010 draft Basin Plan amendments now contain more detailed language describing the adaptive management

approach as well as more detailed requirements for the Board to conduct a Phase 1 Program Review. During the Phase 1 Program Review, the Central Valley Water Board can consider modifying wasteload allocations and/or fish tissue objectives based on the results of the Phase 1 studies and other new scientific and management information.

Both of these commitments should include guidance and oversight by a technical advisory committee (TAC) comprised of technical and policy experts.

R-259: Staff agrees. A new section was developed for the February 2010 draft BPA, “Technical Advisory Committee and Adaptive Management Approach”, that provides more details (developed with stakeholder input during the formal stakeholder process) than what was previously in the 2008 draft BPA.

p. BPA-2, compliance schedules

When implementing the waste load allocations in this control program, the Regional Water Board may include schedules of compliance in NPDES permits that give permittees up to 2030 to comply with water quality-based effluent limits based on the waste load allocations. The compliance schedules in the permits must be as short as possible and must be consistent with the requirements of the Clean Water Act, EPA regulations at 40 CFR 122.476, and State law and regulations.

The underlined portion creates a false sense of security regarding future timelines. Dischargers need greater certainty that compliance will not be enforced from the beginning of Phase 2.

R-260: Staff worked with SRCSD, CVCWA and other stakeholders during the formal stakeholder process to evaluate options for BPA language that address SRCSD’s need for greater certainty. Compliance schedules are constrained by a variety of state and federal laws and regulations. Under these regulations, compliance schedules may not automatically be granted but must be justified on a facility-specific basis. The draft BPA was updated to state:

“Beginning in Phase 2, the Regional Water Board shall, as necessary, include schedules of compliance in NPDES permits for compliance with water quality-based effluent limits based on the waste load allocations. The compliance schedules must be consistent with the requirements of federal laws and regulations, including, USEPA regulations 40 CFR 122.47, State laws and regulations, including State Water Board Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits, and the Final Compliance Date.”

Section: Phase 1 Characterization and Control Studies (p.BPA-3)

p. BPA-3, collaborative opportunities

Dischargers may work individually or develop collaborative Characterization and Control Studies...

A more sustainable approach would be for all source categories to work collaboratively to prepare a regional Characterization and Control Study.

R-261: This option is allowable. Board staff worked with SRCSD and other stakeholders to develop the following BPA text included in the February 2010 draft BPA that more explicitly allows a variety of options:

“Control Studies can be developed through a stakeholder group approach or other collaborative mechanism, or by individual dischargers. Individual dischargers are not required to do individual studies if the individual dischargers join a collaborative study group(s).”

“Dischargers in the Central Valley that are not subject to the Delta Mercury Control Program but may be subject to future mercury control programs in upstream tributary watersheds are encouraged to participate in the coordinated Delta Control Studies. Dischargers in and upstream of the Delta who participate in the Control Studies will be exempt from conducting equivalent Control Studies required by future upstream mercury control programs.”

p. BPA-4, TAC formation and purpose

To clarify the commitment to the process of incorporating a TAC, the following edits should be made to the first paragraph:

Regional Water Board staff will ~~work to form a technical...~~ By [one-year 6 months after the effective date of this amendment], staff will report to the Regional Water Board the ~~process towards formation of the technical advisory committee~~ list of committee members and a statement of their primary objective.

R-262: Board staff worked with SRCSD and other stakeholders to develop the revised schedules included in the February 2010 draft BPA, which requires the formation of the TAC by nine months after the Effective Date.

p. BPA-4, offsets use

The stricken text below reflects an attitude towards offsets of having to make up for a breach of the rules. Suggested edits are underlined:

The Regional Water Board will consider: modification of methylmercury goals, objectives, or allocations; adoption of management practices and implementation schedule for methylmercury controls; and adoption of a Mercury Offset Program to compensate for loads in excess of the methylmercury allocations. and adoption of a Mercury Offset Program as an equivalent option for compliance with mercury and methylmercury allocations

R-263: Board staff worked with SRCSD and other stakeholders during the formal stakeholder process to develop the following BPA text to address SRCSD's concerns as well as the concerns of local fishing communities:

“... and adoption of a Mercury Offset Program for dischargers who cannot meet their load and waste load allocations after implementing all reasonable load reduction strategies and can demonstrate no disproportionate impacts on local communities as a result.”

p. BPA-5, participation by upstream dischargers

The lack of certainty conveyed by the stricken text below is a disincentive to any upstream party's participation. Suggested change is underlined.

If such dischargers (upstream dischargers not required to participate in this TMDL) actively participate in the studies, they may will be exempt from conducting their own individual studies as part of any future upstream mercury control programs.

R-264: Board staff worked with SRCSD and other stakeholders to develop the following BPA text included in the February 2010 draft BPA that addresses SRCSD's comment:

“Dischargers in the Central Valley that are not subject to the Delta Mercury Control Program but may be subject to future mercury control programs in upstream tributary watersheds are encouraged to participate in the coordinated Delta Control Studies. Dischargers in and upstream of the Delta who participate in the Control Studies will be exempt from conducting equivalent Control Studies required by future upstream mercury control programs.”

Section: NPDES Wastewater Treatment Facilities (p.BPA-6)

p. BPA-6, monitoring requirements

The Regional Board already required monitoring data from all Central Valley wastewater facilities, under a 13267 letter in 2003. Those data have been used in many ways since then, particularly for the ongoing comparison in treatment plant performance and in this TMDL to set interim concentration limits and final wasteload allocations. The Regional Board should seriously consider the value in asking the designated facilities to initiate (or to continue) costly effluent and receiving water methylmercury monitoring.

The underlined text should be added:

The Regional Water Board may require facilities not listed in Table C to monitor methylmercury and total mercury based on facility- and receiving water-specific conditions. After one year of monitoring, facilities may modify their monitoring frequency with approval of the Executive Officer.

R-265: Board staff worked with SRCSD and other stakeholders during the formal stakeholder process to develop the following draft BPA text to address this SRCSD comment in a flexible and reasonable manner:

“During Phase 1 and Phase 2, NPDES facilities listed in Table B shall conduct effluent total mercury and methylmercury monitoring starting by [one year after the Effective Date]. Monitoring frequencies shall be defined in the NPDES permits. Effluent monitoring requirements will be re-evaluated during the Delta Mercury Control Program Reviews.”

“Facilities that begin discharging to surface water during Phase 1 and facilities for which effluent methylmercury data were not available at the time Table B was compiled, shall conduct monitoring.”

p. BPA-6, effluent concentration limits

Non-attainment of the proposed interim effluent limits would result in permit violations and associated penalties, but would not produce change in wastewater treatment in the near term. Given the minor magnitude of POTWs as mercury sources to the Delta, there would be minimal additional value to water quality or to society in setting effluent limits for these dischargers.

R-266: In response to input from SRCSD and other stakeholders before and after the April 2008 hearing meeting, the draft BPA language no longer contains performance-based, Phase 1 interim effluent methylmercury concentration limits. Instead the February 2010 contains performance-based, Phase 1 effluent total mercury mass limits, developed by stakeholders who participated in the NPDES Facility Workgroup (including SRCSD, CVCWA and Board staff), a subset of the formal stakeholder process that took place after the April 2008 hearing meeting. Interim requirements are required by state and federal laws and regulations

for NPDES facilities that do not yet comply with effluent limits (e.g., waste load allocations). Numeric allocations are a required component of TMDLs

Section: Cache Creek Settling Basin

It is unclear how the TMDL can require managers of the Cache Creek Settling Basin to reduce mercury loads discharged from the basin. This requirement falls into the category of “no good deed goes unpunished”. The constructors and managers of the basin are not responsible for the mercury that passes through the basin. Rather, by building the basin they have effectively removed approximately half of the inflowing mercury. This requirement would effectively stop any implementing entity from constructing a settling basin anywhere in the Central Valley for fear of later having to improve it beyond its intended design for reasons beyond their control.

R-267: The Cache Creek Settling Basin was constructed in 1937 by the U.S. Army Corps of Engineers (USACE) to contain sediment that would otherwise build up in Yolo Bypass and decrease its ability to protect the Sacramento region from flooding. The USACE turned over operation and maintenance of the basin to California Department of Water Resources (DWR) in 1994. The Cache Creek Settling Basin is of particular importance because, even though the basin traps about half of the sediment-bound mercury that enters it from the Cache Creek watershed, discharges from the basin comprise the largest single source of mercury-contaminated sediment to the Delta. The sediment trapping efficiency of the basin will decrease as it fills. The basin will fill to its design capacity in about 35 years, and its trapping efficiency may reach zero in about 50 years, unless a maintenance program is established. At this time, no maintenance program to maintain the trapping efficiency or life of the basin is in place.

R-268: DWR is a state agency. SRCSD and other stakeholders have stated that the State of California should be responsible for inorganic mercury transported by and methylmercury produced in waters of the State. For example, in SRCSD's 9 April 2008 comments, SRCSD wrote, “The bottom line is that the major sources of mercury loads to the Delta are “legacy” – related to gold mining going back to 1849. The sources of this “legacy” mercury are sediments in Waters of the State of California. It would seem appropriate that the State of California be allocated responsibility for this 75% portion of the identified methylmercury loading to the Delta.” Requiring the State to improve the trapping efficiency of the Cache Creek Settling Basin and reduce the amount of mercury-contaminated sediment leaving the Cache Creek watershed is one way of allocating responsibility to the State for reducing methylmercury produced by sediments in waters of the State.

R-269: Board staff worked with staff from DWR, Central Valley Flood Protection Board (another state agency), USACE and other stakeholders to revise the schedule in the draft BPA to allow adequate time to initiate the process for Congressional authorization to modify the basin, evaluate the trapping efficiency of the Cache Creek Settling Basin, and work with the landowners within the basin and local communities affected by basin improvements to evaluate potentially feasible alternative(s) for mercury reduction from the basin, including the feasibility of decreasing mercury loads from the basin, up to and including a 50% reduction from existing loads; and develop a detailed strategy for improvements to the basin to decrease mercury loads from the basin.

R-270: The comment is that the Basin Plan would stop any implementing entity from constructing a settling basin anywhere in the Central Valley “for fear of later having to improve it beyond its intended design for reasons beyond their control”. The settling basin was designed and built with a consideration to have an operations and maintenance plan to control sediment

from the basin. Future settling basin projects should include requirements to maintain a state/federal construction projects.

Section: Pilot Mercury Offset Projects and Early Implementation of Total Mercury Reduction Efforts (p.BPA-13)

We support the concept of offset programs as an alternative and equivalent regulatory compliance tool. We support the preliminary efforts made to begin consideration of an offset program; however, we would like to see more effort put into the program from the beginning of TMDL implementation. These comments are intended to encourage and help develop a feasible program, consistent with the studies submitted to the Regional Board in 2005 by SRCSD and in 2006 by the City of Stockton. For context, here are the motivations for the Regional Board to provide more positive guidance in this TMDL:

- **Permits given to SRCSD and the City of Stockton required offset feasibility studies. Regional Board staff participated in SRCSD's study.**
- **The San Francisco Regional Water Board expressed interest in seeing how mercury offsets work in the Central Valley.**
- **Regional Board members expressed interest in developing an offset program during development of the Cache Creek mercury TMDL.**
- **SRCSD submitted its offset feasibility study in March 2005 but received no response.**
- **The Cache Creek TMDL, with vague language suggesting the possibility of offsets, has been approved by the Regional and State Boards.**

Over-arching comments are that:

- **At this time, we see a fixed compliance date for wasteload allocations yet no feasible means to comply. An offset program appears to be the only reasonable option available, yet this TMDL leaves it to others to develop. In stalling the implementation of an offset program that will inevitably be necessary for dischargers to meet WLAs, the Regional Board is delaying the compliance process.**

R-271: Individual waste load allocations and compliance schedules – including interim limits - are required for point sources by the Clean Water Act, USEPA requirements for TMDLs, and the State Water Board's Policy for Compliance Schedules for NPDES Permits and the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (a.k.a. State Implementation Plan or SIP). Even so, the Central Valley Water Board does have flexibility in deciding how to implement the allocations. Because additional studies need to be conducted to evaluate methylmercury and total mercury control measures, staff proposed a control program with a phased approach that allows allocations and compliance schedules to be amended once additional studies are completed. During the stakeholder process, staff worked with stakeholders to develop Basin Plan amendment requirements that better balance flexibility with long-term certainty, and still have a control program that is scientifically defensible and complies with CWA/USEPA/State Water Board requirements, including assigning allocations and compliance schedules. For example, implementation of methylmercury control measures to comply with the proposed allocations would not be required until Phase 2, which would not begin until control programs have been developed for the major tributary inputs and the Central Valley Water Board has completed a Phase 1 Program Review.

R-272: The following text was crafted with SRCSD and other stakeholder input during the formal stakeholder process and included in the February 2010 draft BPA:

“On or before [nine years after Effective Date] the Regional Board will consider adoption of a mercury (inorganic and/or methyl) offsets program. During Phase 1, stakeholders may propose pilot offset projects for public review and Regional Board approval.”

R-273: In addition, Board staff worked with SRCSD, CVCWA and other stakeholders to craft guiding principles for the development of Phase 1 pilot offset projects and a long-term offset program that would encourage the implementation of near-term projects to make near-term environmental improvements and generate useful scientific and policy data, as well as give dischargers credit that would enable more compliance flexibility. Additional methylmercury control studies need to be completed to determine which within-Delta and watershed sources have the most feasible and cost-effective control options that would make them suitable long-term offset projects and ensure that the fish tissue objectives are met in all areas of the Delta without impairing critical habitat in the Delta or its tributary watersheds.

R-274: Staff attempted to address the above concerns and other stakeholder concerns about how the Board should address offset projects in their April 2008 hearing presentation and in the follow-up document, “Staff’s Initial Responses to Board and Stakeholder Questions and Comments at the April 2008 Hearing” (see item A-5, pages 23 through 28). These concerns were further explored during the formal stakeholder process after the April 2008 hearing meeting and will continue to be explored during the Phase 1 stakeholder process. They are an example of the conceptual conflict documented by the Center for Collaborative Policy (CCP) Stakeholder Process Assessment,⁵⁰ the inherent conflict between the regulated communities’ desire for a stable, predictable regulatory environment that offers consistent interpretation and enforcement over the long-term, while also seeking a flexible, non-prescriptive regulatory environment that accommodates variability and innovation.

- **Every constraint and complicating factor applied to offsets will reduce the feasibility of the entire program. Constraints to note include separating total and methyl mercury allocation dates and offset programs, and delineating the TMDL boundary around the Delta excluding upstream areas and many Sierra Nevada foothill reservoirs that currently have fish consumption advisories.**

R-275: The February 2010 draft BPA text noted in the previous responses does not separate total and methyl mercury offset programs, or exclude offsets with upstream sources. Also, as noted earlier, the revised draft BPA includes language that commits the Central Valley Water Board to developing mercury control programs for the major tributaries to the Delta/Yolo Bypass during Phase 1, which better establishes the foundation for a Phase 2 offset program that enables dischargers in the Delta and Yolo Bypass to conduct offset projects in upstream watersheds.

- **No responsible discharger is going to implement a total mercury offset project, to get only total mercury credits knowing that the Regional Board could come back with separate, additional methylmercury allocations or permit concentration limit that could potentially result in hundreds of millions of dollars in plant technology improvement.**

⁵⁰ The Briefing Summary for the CCP Stakeholder Process Assessment is available at: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/stakeholder_meetings/19dec08_brfg_summ_handout.pdf

Mercury concentration limits will require end-of-pipe compliance and the focus will be on paying for additional treatment. Mercury regulation based on mass, and offset projects that provide both total and methylmercury credit, would provide the most potential of early improvements in fish tissue.

R-276: The written comments provided by CVCWA had the same concern, “No responsible POTW is going to implement an offset project while knowing that (a) the Regional Board could subsequently enforce methylmercury allocations or set concentration limits that could potentially result in hundreds of millions of dollars in on-site controls, and (b) future TMDLs in tributary watersheds could allocate or otherwise mandate reductions by any identified offset projects.” Staff supports the development of a fair and effective short-term pilot offset project policy and long-term offset program and appreciates SRCSD and CVCWA concerns. It was for these reasons that Board staff proposed a phased approach to developing a Delta mercury control program (along with a long-term offset program), with a compliance date of 2030, in the February 2008 draft BPA. Staff appreciates that it may not make sense for a discharger to commit to a long-term offset project until the upstream TMDLs have been completed and the Central Valley Water Board has re-evaluated the Delta methylmercury allocations and compliance schedules based on those TMDLs and additional control study results. For these reasons, staff worked with SRCSD, CVCWA and other stakeholders after the April 2008 hearing meeting to develop BPA language that would not require implementation of methylmercury controls to achieve the proposed allocations until after the Board has developed control programs for the major tributary inputs, considered the adoption of an offset program, and completed the Phase 1 Program Review.

- **Any offset program should not attempt to unfairly leverage POTWs beyond their proportional contribution to the mercury problem. The State Water Board has stated that such unfair leveraging shall not occur in its resolution remanding the San Francisco Bay mercury TMDL.**

R-277: Board staff considered State Water Board's Resolution No. 2005-0060 when developing the February 2008 draft BPA text. The February 2010 draft Basin Plan amendments contain guidance for developing Phase 1 pilot offset projects and a long-term offset program updated since the February 2008 version to reflect additional input from SRCSD, CVCWA and other stakeholders during the formal stakeholder process after the April 2008 hearing meeting. In particular, the updated BPA contains the following language:

“Offsets should not include requirements that would leverage existing discharges as a means of forcing dischargers to bear more than their fair share of responsibility for causing or contributing to any violation of water quality standards. In this context “fair share” refers to the dischargers’ proportional contribution of methylmercury load.”

“Offset credits should be available upon generation (i.e., after an offset project is implemented) and last long enough (i.e., not expire quickly) to encourage feasible projects.”

Stakeholders, including Board staff, have committed to developing a more detailed credit strategy during Phase 1 of the proposed control program.

- **Offset projects in tributary watersheds will be stalled by the concern that future TMDLs will allocate or otherwise mandate reductions by any identified offset projects.**

R-278: The updated BPA would not require implementation of methylmercury controls to achieve the proposed allocations until after the Board has developed control programs for the

major tributary inputs, considered the adoption of an offset program, and completed the Phase 1 Program Review. In addition, Board staff worked with SRCSD, CVCWA and other stakeholders to craft guiding principles for the development of Phase 1 pilot offset projects and a long-term offset program that would encourage the implementation of near-term projects to make near-term environmental improvements and generate useful scientific and policy data, as well as give dischargers credit that would enable more compliance flexibility. Additional methylmercury control studies need to be completed during Phase 1 to determine which within-Delta and watershed sources have the most feasible and cost-effective control options that would make them suitable long-term offset projects and ensure that the fish tissue objectives are met in all areas of the Delta without impairing critical habitat in the Delta or its tributary watersheds. Such studies can occur in parallel with the development of the upstream TMDLs, so that the studies and upstream TMDL allocations can identify point and nonpoint sources that may be able to be decreased by more than what would be required by the allocations designed to address local (upstream) impairments and comply with the proposed Delta TMDL allocations for tributary inputs to the Delta and Yolo Bypass.

p. BPA-13, evaluation criterion #5

The text beyond the initial “preference” statement should be deleted. Reasons to consider this change include:

- **Pilot projects in adjacent watersheds (assumed to mean watersheds for the TMDL’s subareas) are unlikely to show significant Delta-wide benefits, unless you consider the knowledge gained a Delta-wide benefit.**

R-279: The language for “evaluation criterion #5” was not included in the February 2010 draft BPA.

- **Adjusting load and wasteload allocations for all sources within the discharger’s watershed to account for environmental impacts at the discharger’s point of discharge is assuming a localized impact. SRCSD’s bioaccumulation study found that not to be a valid assumption.**

R-280: Federal TMDL requirements necessitate that loading from all pollutant (e.g., methylmercury) sources must not exceed the loading (or assimilative) capacity of the Delta, including an appropriate margin of safety. The loading (or assimilative) capacity is the amount of pollutant that a water body can receive without violating the applicable water quality objectives (e.g., the proposed fish tissue methylmercury objectives). As a result, if one discharger is allowed to exceed its methylmercury (waste) load allocation, one or more other discharges must be reduced to compensate. The specific requirements of a TMDL are described in the United States Code of Federal Regulations Title 40, Sections 130.2 and 130.7 (40 CFR §130.2 and 130.7), and CWA Section 303(d).

- **How would allocations be adjusted? EPA guidance says that “Upon revision of the loading capacity, wasteload, or load allocations [in Phase 2], the TMDL would require re-approval by EPA.” This revision process will prove onerous, create discord among potential watershed partners, and hinder the ability of any market-based incentives to act quickly.**

R-281: Allocations would be adjusted during the Phase 1 Program Review and subsequent reviews, and would be subject to USEPA re-approval. However, as noted earlier, Board staff supports exploring alternative and creative watershed-focused approaches during Phase 1 to reducing methylmercury and total mercury sources so that fish tissue objectives can

be met in all areas of the Delta. In addition, USEPA staff and Water Board staff are open to evaluating the concept of regional wasteload allocations for NPDES discharges (e.g., by Delta subarea and/or by tributary watershed) in a manner similar to that done by the San Francisco Bay Water Board. Such approaches would likely be less onerous and allow more flexibility for watershed partners.

p. BPA-14, evaluation criterion #6

It sounds overly ambitious and incongruous to request that pilot offset projects be implemented quickly yet provide long-term results or substantial short-term improvements. If we already knew how to prove long-term results, we would not need to pilot test offset projects. Fundamental principles of pilot offset project should be provided in this BPA including consideration of the exploratory and fact-finding nature of the effort.

R-282: The language for “evaluation criterion #5” was not included in the February 2010 draft BPA.

p. BPA-14, offset pilot project requirements

Overall these requirements indicate a profound misunderstanding of the purpose of market-based incentives such as offsets. The purpose of offsets is to encourage innovation and early action, and to save society money. Comments are provided using the same numbering system as the requirements.

The following edits would reduce a disincentive of timely credit use:

1. Dischargers that implement approved pilot total mercury and methylmercury offset projects to accumulate credits may use the credits to ~~extend time schedules for compliance with methylmercury wasteload allocations by up to five years, but shall not use the credits to extend schedules beyond 2035~~ for as long as credits last.

R-283: As noted earlier, the February 2010 draft Basin Plan amendments contain guidance for developing Phase 1 pilot offset projects and a long-term offset program updated since the February 2008 version to reflect additional input from SRCSD, CVCWA and other stakeholders during the formal stakeholder process after the April 2008 hearing meeting. In particular, the updated BPA contains the following language:

“Offset credits should be available upon generation (i.e., after an offset project is implemented) and last long enough (i.e., not expire quickly) to encourage feasible projects.”

Stakeholders, including Board staff, have committed to developing a more detailed credit strategy during Phase 1 of the proposed control program.

R-284: Federal TMDL requirements necessitate that loading from all pollutant (e.g., methylmercury) sources must not exceed the loading (or assimilative) capacity of the Delta, including an appropriate margin of safety. As mentioned earlier and reviewed in the CEQA analysis (see Chapter 7, Section IV. Biological Resources, in the draft BPA Staff Report), if a discharger is allowed to use accrued credit to offset long-term increases in their methylmercury discharges, or to use credit accrued from projects in other watersheds, the load and waste load allocations for sources upstream of the discharge would need to be adjusted to ensure that fish tissue objectives are achieved and maintained in compliance with Clean Water Act requirements for TMDLs.

The basis for approving offsets should be strictly related to environmental benefits. There is no inherent value in doing on-site controls – even if feasible – versus reducing a greater load from an otherwise uncontrolled source. Delete requirement 2:

2. Any discharger proposing a pilot offset project shall conduct the Characterization and Control Studies to determine the feasibility of on-site controls for its own methylmercury discharges.

R-285: Board staff worked with SRCSD and other stakeholders during the formal stakeholder process to develop the following text to address SRCSD's concerns as well as the concerns of local fishing communities:

"Offset credits should only be available to fulfill a discharger's responsibility to meet its (waste) load allocation after reasonable control measures and pollution prevention strategies have been implemented."

"Offsets should not be allowed in cases where local human or wildlife communities bear a disparate or disproportionate pollution burden as a result of the offset."

The TMDL already states that the Board will not consider implementing a program for eight years. There's no value in closing the window of opportunity before then. Delete requirement 3.:

3. Pilot offset proposals must be submitted to the Regional Water Board by [4 years after the effective date of this amendment].

R-286: This text was not included in the February 2010 draft BPA.

A safety factor would be a component of an offset ratio. The following edit should be made:

4. Pilot offset proposals shall evaluate mercury/methylmercury transformations in the environment at the location of the offset project, and shall include an appropriate offset ratio ~~and safety factor~~ to account for the location and uncertainties of the benefits of the offset project versus the environmental impact of the effluent discharge.

R-287: This text was not included in the February 2010 draft BPA. Stakeholders, including Board staff, have committed to developing a more detailed credit strategy during Phase 1 of the proposed control program.

The formal State Water Board's scientific peer review process would be cumbersome and time consuming, not commensurate with the pilot nature of any projects that would be proposed. The following requirement should be deleted or replaced with something more practical such as approval by the Executive Officer:

5. Any proposed project shall be subject to scientific peer review under the State Water Board's external scientific peer review process developed to comply with Health and Safety Code section 57004. Following peer review, staff shall circulate the proposal for public review and comment and then shall present the proposal for consideration for approval by resolution of the Regional Water Board.

R-288: This detailed language was removed from the draft BPA. Board staff worked with SRCSD and other stakeholders to develop the following draft BPA text that allows more flexibility:

“During Phase 1, stakeholders may propose pilot offset projects for public review and Regional Board approval.”

The requirement on p. BPA-14, last paragraph, is inconsistent with evaluation criterion #6. The edits provides would help along with deleting the last paragraph on p. BPA-14:

6. The period for offset credit accumulation shall not exceed 10 years following Regional Water Board approval of the pilot offset project unless the pilot is extended and approved as a full offset project. At any time, the Regional Water Board may review the project and consider a time extension.

R-289: This text was not included in the February 2010 draft BPA. Stakeholders, including Board staff, have committed to developing a more detailed credit strategy during Phase 1 of the proposed control program.

Offsets are a type of trade. The scenarios that requirement #8 would prohibit include a conservation organization who generates credits and then wants to recoup expenses, or sponsors who run short of funds before project completion and seeks partners to cost share. Requirement #8 should be deleted.

R-290: The February 2008 draft BPA included the following:

“8. Credits accumulated by an offset project shall not be tradable to any other party.”

This text was not included in the February 2010 draft BPA. The types of trade that can take place will be further explored with the stakeholder process during Phase 1.

p. BPA-14, last paragraph

The five-year requirement and 2035 end dates are unnecessary and reduce the feasibility of offsets as a compliance tool, contrary to the intent of criterion #6 discussed above. The entire paragraph should be deleted.

R-291: This text was not included in the February 2010 draft BPA. Stakeholders, including Board staff, have committed to developing a more detailed credit strategy during Phase 1 of the proposed control program.

R-292: Federal TMDL requirements necessitate that loading from all pollutant (e.g., methylmercury) sources must not exceed the loading (or assimilative) capacity of the Delta. As mentioned earlier and reviewed in the CEQA analysis (see Chapter 7, Section IV. Biological Resources, in the draft BPA Staff Report), if a discharger is allowed to use accrued credit to offset long-term increases in their methylmercury discharges, or to use credit accrued from projects in other watersheds, the load and waste load allocations for sources upstream of the discharge would need to be adjusted to ensure that fish tissue objectives are achieved and maintained in compliance with USEPA and Clean Water Act requirements for TMDLs. This factor will be considered by efforts to develop a long-term offset program during Phase 1.

p. BPA-15, items 1 and 4 under credit for SRCSD mercury reduction activities:

Item 4 is inconsistent with item 1 which acknowledges the mass limitation in our current permit and the credit accumulated for total mercury, grants credit for methylmercury reductions, and makes those credits available to the extent that credit has accumulated. It is unclear if accrued credits that have accumulated under Order No. 5-00-188 cease after [the effective date of this amendment].

R-293: It was intended that the accrual of credits would cease after the Effective Date of the amendment, and that the credits would still be available for use after the Effective Date.

R-294: Because of the complexity of this topic, Board staff, SRCSD and other stakeholders who participated in the formal stakeholder process after the April 2008 hearing meeting agreed to not include a credit strategy in the February 2010 draft BPA and instead develop a credit strategy during Phase 1 of the proposed control program. The February 2010 draft BPA does not include a specific credit strategy for SRCSD.

p. BPA-15, Risk Management Program

Assigning responsibility to minor sources to develop risk management plans implies that those sources are primarily responsible for the impairment. As the majority of mercury in our watershed is from legacy sources, not the minor sources, the State of California should share in funding, development and implementation of risk management plans. As was learned from the Calfed Fish Mercury Program, any education and outreach activity should be coordinated through local community groups and state and county Departments of Health Services and Education.

R-295: This topic was discussed extensively during the formal stakeholder process. Board staff agrees that it doesn't make sense that dischargers individually should develop their own risk management plans. The February 2010 draft BPA would create a collaborative effort that would be coordinated with members of local fishing and consumer communities, the State Water Board, Office of Environmental Health Hazard Assessment, California Department of Public Health, and local county health departments to develop and implement an effective strategy. The February 2010 draft BPA requires that dischargers contribute to the exposure reduction program. As described in the draft BPA Staff Report (see Section 4.3.1), staff will work with stakeholders to obtain other funding in order to have a more comprehensive program than would be possible through discharger funding alone. Possible additional sources of funds could include governmental or private grant programs, new bond or other state funds that allow spending on exposure reduction, and public health programs.

Section: Recommendations for Other Agencies (p.BPA-16)

The implementation plan needs to consider more fully the effects of non-action by others. The implementation plan requirements that the Regional Board imposes on itself and on entities over which the Regional Board has no authority are significant. Non-compliance with the schedule of activities by the Regional Board will create compliance issues and regulatory uncertainty for all.

R-296: Board staff appreciates SRCSD's concerns and worked with SRCSD, state and federal agency staff, and other stakeholders during the formal stakeholder process to revise the draft BPA so that it includes:

- Requirements for the Central Valley Water Board to develop mercury control programs for the major tributaries and complete the proposed Phase 1 Delta Mercury Control Program Review before requiring implementation of Phase 2 methylmercury management practices identified in Phase 1 for the purposes of achieving methylmercury allocations; and
- More detailed requirements and schedules for Phase 1 methylmercury control studies and Phase 2 control actions by state and federal agencies whose projects affect the transport of mercury and the production and transport of methylmercury through the Yolo Bypass and Delta, or manage open water areas in the Yolo Bypass and Delta, including but not limited to Department of Water Resources, State Lands Commission, Central Valley Flood Protection Board, State Water Resources Control Board, U.S. Army Corps of Engineers, and U.S. Bureau of Reclamation. State and federal projects include projects related to flood conveyance, water management and storage, dredging and dredge materials disposal, dewatering and reuse, and salinity control that have the potential to increase ambient mercury and/or methylmercury levels in the Delta or Yolo Bypass.

R-297: Water Code Section 13146 requires that, in carrying out activities that affect water quality, all state agencies, departments, boards and offices comply with state policy for water quality control unless otherwise directed or authorized by statute, in which case they must indicate to the State Water Board in writing their authority for not complying with such policy. In addition, Clean Water Action Section 313 provides that federal agencies must comply with federal, state and local requirements for the control of water pollution. CWA Section 313 states:

“(a) Each department, agency, or instrumentality of the executive, legislative, and judicial branches of the Federal Government (1) having jurisdiction over any property or facility, or (2) engaged in any activity resulting, or which may result, in the discharge or runoff of pollutants, and each officer, agent, or employee thereof in the performance of his official duties, shall be subject to, and comply with, all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water pollution in the same manner, and to the same extent as any nongovernmental entity including the payment of reasonable service charges.”

The Regional Board must recognize that mercury in the Delta is but one pollutant in one water body among dozens of others. The 2006 303(d) list includes over 100 water bodies in the Central Valley region impaired by over 150 pollutants. Mercury is included as a pollutant in 38 of those water bodies. The two major TMDLs underway, Cache Creek and the Delta, both incorporate a phased approach requiring follow-up over the next decade. Just to start, this TMDL must be approved by the State Board and EPA, while the Regional Board must provide guidance for special study work plans and then approve work plans. Pending the completion of the required special studies, the Regional Board must digest the multiple study reports along with Calfed and others’ science reports to develop phase 2 of the TMDL. In the event that Regional Board does not meet its obligations, the default for NPDES permits, which are renewed ostensibly every five years, may be to implement the TMDL goals as effluent limits.

R-298: As noted earlier, the revised draft BPA includes requirements for the Central Valley Water Board to develop mercury control programs for the major tributaries and complete the proposed Phase 1 Delta Mercury Control Program Review before requiring implementation of Phase 2 methylmercury management practices identified in Phase 1 for the purposes of achieving methylmercury allocations.

R-299: In addition, Board staff worked with SRCSD and other stakeholders during the formal stakeholder process to:

- Develop a Phase 1 schedule that allows adequate time for the Technical Advisory Committee and Board staff to digest the Phase 1 study reports and new information that becomes available during Phase 1 and adequate time for a stakeholder process to be incorporated in the effort to develop Phase 2 of the control program.
- Develop a strategy for how to address delays in the Phase 1 control studies and extend the Phase 1 control study schedule, Program Review schedule, the schedule for Phase 2 implementation of methylmercury controls, and the Final Compliance Date for the load and waste load allocations.

These efforts are reflected in the revised text included in the February 2010 draft BPA. Please refer to the draft BPA sections “Mercury Control Studies Schedule” and “Phase 1 Delta Mercury Control Program Review”.

Many actions in the TMDL implementation plan are suggestions, recognized as being beyond the jurisdiction of the Regional Board. Yet these actions are pre-requisites for many subsequent requirements. For example, p. BPA-17, middle states [emphasis added]: “The State Water Board should consider...”

R-300: As noted earlier, the draft BPA was revised to include more detailed requirements and schedules for state and federal agencies (including the State Water Board), including requirements for Phase 1 methylmercury control studies and Phase 2 control actions.

Without the results of these hoped-for studies, critical information for developing the Phase 2 implementation plan will be missing. Regional Board staff must:

- **Develop an overall strategy for completing TMDLs in the Central Valley that addresses monitoring and special studies, use of the phased approach, and opportunities for addressing multiple pollutants or water bodies concurrently.**
- **Recognize the contingencies associated with conditions imposed on permittees and be more explicit in what would trigger the end of Phase 1.**

R-301: As noted earlier, the revised draft BPA includes requirements for the Central Valley Water Board to develop mercury control programs for the major tributaries and complete the proposed Phase 1 Delta Mercury Control Program Review before requiring implementation of Phase 2 methylmercury management practices identified in Phase 1 for the purposes of achieving methylmercury allocations.

R-302: Board staff worked extensively with SRCSD and other stakeholders during the formal stakeholder process to develop text for the draft BPA that better defines the adaptive management approach to managing and modifying the Delta mercury control program during Phase 1 and later phases of the program. Please refer to the draft BPA sections, “Technical Advisory Committee and Adaptive Management Approach”, “Mercury Control Studies Schedule” and “Phase 1 Delta Mercury Control Program Review”.

R-303: The revised draft BPA also contains the following text from page BPA-9 of the February 2010 draft Basin plan amendments, which recognizes the contingencies associated with conditions imposed on permittees:

“By [nine years after Effective Date] at a public hearing, and after a scientific peer review and public review process, the Regional Water Board shall review and reconsider, if appropriate, the Delta Mercury Control Program and may consider modification of objectives, allocations, implementation provisions and schedules, and the Final Compliance Date.

If the Executive Officer allows an extension for the Control Studies’ schedule, then the Delta Mercury Control Program Review may be delayed up to two years. If the Delta Mercury Control Program Review is delayed more than one year, the Regional Water Board should consider extending the schedule for Phase 2 implementation of methylmercury controls, and the Final Compliance Date.

The Regional Water Board shall assess: (a) the effectiveness, costs, potential environmental effects, and technical and economic feasibility of potential methylmercury control methods; (b) whether implementation of some control methods would have negative impacts on other project or activity benefits; (c) methods that can be employed to minimize or avoid potentially significant negative impacts to project or activity benefits that may result from control methods; (d) implementation plans and schedules proposed by the dischargers; and (e) whether methylmercury allocations can be attained.

The Regional Water Board shall use any applicable new information and results of the Control Studies to adjust the relevant allocations and implementation requirements as appropriate. Interim limits established during Phase 1 and allocations will not be reduced as a result of early actions than result in reduced inorganic (total) mercury and/or methylmercury in discharges.”

Section: Tables B & C (p.BPA-34)

SRCSO Walnut Grove WWTP and West Sacramento WWTP are listed as permitted facilities. Walnut Grove will be discharging to the SRCSO system in the near future and the City of West Sacramento began discharging to SRCSO in November 2007. In addition, the California State Central Heating and Cooling facility is listed. There is a proposal by the State to cease discharging into the Sacramento River and redirect any new wastewater associated with this activity to SRCSO (cooling system blow-down). Table C (p. 35) lists Procter & Gamble Co. WWTP as a discharging facility. We believe they have directed that flow to the SRCSO system (cooling tower blow-down). Please explain any impact these issues have on overall allocations for SRCSO.

R-304: The draft BPA was updated to reflect that the SRCSO Walnut Grove WWTP, West Sacramento WWTP, California State Central Heating and Cooling facility, San Joaquin County Service Area 31 Flag City WWTP, and Rio Vista Trilogy WWTP no longer discharge; i.e., allocations are no longer included for these facilities in the draft BPA. Section 8.1.3 in Chapter 8 of the February 2010 draft TMDL Report explains how allocations were calculated to address that some facilities that discharged during the TMDL period (water years 2000 through 2003) no longer discharge to surface water and/or had influent re-directed to another treatment plant.

The percent reduction requirements used to calculate the allocations in the BPA do not agree with the percent reduction requirements presented on p. xx in the Staff Report. This makes it impossible to know which numbers staff wishes to use. Because the BPA tables carry allocations that will be enforced on sources and permittees, it is important that we have confidence that the BPA is, in fact, populated with numbers supported by the work presented in the staff report. Consistency will help clarify the mathematics. A comparison table is provided here:

Comparison of MeHg Loads (g/yr) numbers given by the BPA, BPA Staff Report, and TMDL Staff Report

Source	2008 BPA		2008 BPA Staff Rpt		2008 TMDL Staff Rpt	
	Load (g/yr)	Percentage	Load (g/yr)	Percentage	Load (g/yr)	Percentage
Agriculture	122.9	?	122.8	2.4%	122.9	2.4%
Wetlands	987.3	?	983.3	18.8%	987.3	18.9%
Open Water	852.2	?	860.2	16.5%	852.2	16.3%
Tributaries	2989.5	?	3003.9	57.6%	3011.5	57.7%
Mun/Ind Wastewater	----	?	205.7	3.9%	203.2	3.9%
MS4s	18.9	?	19.8	0.4%	18.9	0.4%
Atmospheric Deposition	----	?	22.7	0.4%	22.7	0.4%
Urban runoff (nonpoint source)	----	?	----	----	0.8	0.0%
Sum	?	?	5218.4	100%	5219.6	100%

R-305: Board staff made the minor adjustments needed to ensure that the BPA tables contain allocations that are supported by the work presented in the staff reports. Some inconsistencies may continue to exist when existing loads and allocations are summed by category because calculations for individual sources and allocations were completed prior to rounding for the sums. The individual load and waste load allocations in the Basin Plan amendment tables are what are enforceable in permits and other waste discharge requirements. To clarify, the summary tables and figures in the BPA Staff Report and TMDL report are not used for enforcement of individual allocations.

Comments on Staff Reports

1. Implementation Date

p.1 “Implementation will begin after the Basin Plan amendments are legally applicable.”

Please clarify that this also refers to the “effective date” that the Basin Plan amendment refers to and describe the process that leads to the “effective date”.

R-306: The proposed Basin Plan amendments for control of methylmercury and total mercury in the Delta will be legally applicable once they are adopted by the Central Valley Water Board and approved by the State Water Board, the California Office of Administrative Law, and the USEPA. To address SRCSD’s comment, the text in the draft BPA was revised to more clearly state that the “Effective Date” of the Delta mercury control program defined by the Basin Plan amendments is the date that the control program is approved by the USEPA.

2. Delta Fisheries Importance

p.21, last paragraph

The conversation of consumption rates has tended to focus on the highest consumers. The assumption here is that 10% of mothers in the Delta are eating so much locally-caught fish that their children would be impaired. Is this a reasonable assumption?

R-307: This is a reasonable assumption for developing a range of estimates for potential loss in income for Delta residents entering the workforce in a single year, as was done on page 21 of the February 2008 report. Creel surveys estimate that anglers spend over two million hours per year fishing on the Sacramento River alone (CDFG, 2000-2001⁵¹; Shilling,

⁵¹ CDFG. 2000-2001. *Central Valley Salmon and Steelhead Harvest Monitoring Project*. 1999 & 2000 creel survey data queried from the California Department of Fish & Game (DFG) creel database.

2003⁵²). In addition, bass and catfish may be the primary fish kept by anglers throughout much of the Delta (Appendix C in the TMDL Report, Figure C.1). People depend on Delta fish for sustenance and cultural reasons. Some consumers eat Delta fish at levels likely harmful to their health. In a survey of 500 anglers and members of community-based organizations, University of California, Davis researchers found that approximately half of Delta anglers and their families take in methylmercury above the USEPA reference dose and 5-6% are exposed to methylmercury at 10 times the reference dose (Shilling, 2009⁵³). The reference dose is a safe level of methylmercury intake, at or below which harmful effects are not expected to occur. Methylmercury intake above the reference dose has been shown to affect memory, fine motor control, and audiovisual learning in children (NRC, 2000⁵⁴). The 10% estimate of mothers with methylmercury intake rates above the safe levels comes from a nationwide study. Based on data from Shilling, mothers and children in the Delta with intake rates above the reference dose is likely greater than 10%.

R-308: To clarify, the proposed fish tissue objectives are based on the consumption of one meal per week of a mixture of local trophic levels 3 and 4 fish. The proposed objectives are not based on the consumption rates of the highest consumers, i.e. four to five meals per week of trophic level 4 fish. As explained in Section 3.2.3 of the draft BPA Staff Report, of the more than 600 sampled waterways in the western United States, none supported a fish population with mercury concentrations low enough to safely support the consumption of four to five meals per week of trophic level 4 fish. In contrast, about 30% to 40% of the sampled waterways supported a fish population with mercury concentrations lower than the proposed fish tissue objectives based on the consumption of one meal per week of local trophic level 3 and 4 fish, which indicates that the proposed objectives may be attainable with implementation of a vigorous control program.

3. Implementation Plan and Schedule

p.25, first paragraph

If the tributaries are assigned load allocations, then they also are required to meet their allocations in 2030. Given that TMDLs have not progressed for those ~40 watersheds, this effect should be reconsidered.

R-309: As noted earlier, to address this concern, new text was added to the draft BPA that specifies dates during Phase 1 by which the Central Valley Water Board commits to developing mercury control programs for the major tributary inputs to the Delta (American,

⁵² Shilling, F. 2003. *Background Information for a Central Valley Fish Consumption Study*. Geographic Information System and relational database for fish tissue mercury and creel survey data. University of California, Davis, CA, 64 pp.

⁵³ Shilling, F. 2009. *Characterizing High Mercury Exposure Rates of Delta Subsistence Fishers*. University of California, Davis, Department of Environmental Science and Policy. Prepared for the Central Valley Regional Water Quality Control Board, May. Available at: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/other_technical_reports/index.shtml

⁵⁴ NRC. 2000. *Toxicological Effects of Methylmercury*. National Research Council, Committee on the Toxicological Effects of Methylmercury (NRC). Washington, DC: National Academy Press. Available at: <http://www.nap.edu/books/0309071402/html>.

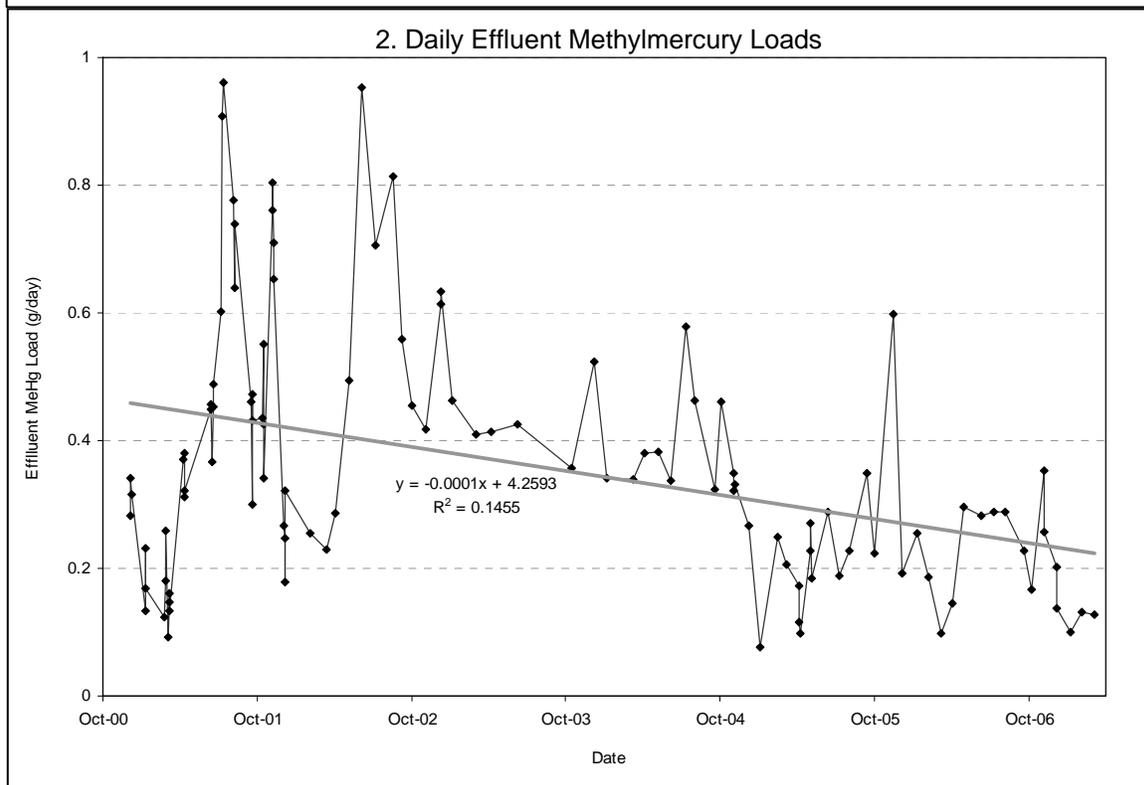
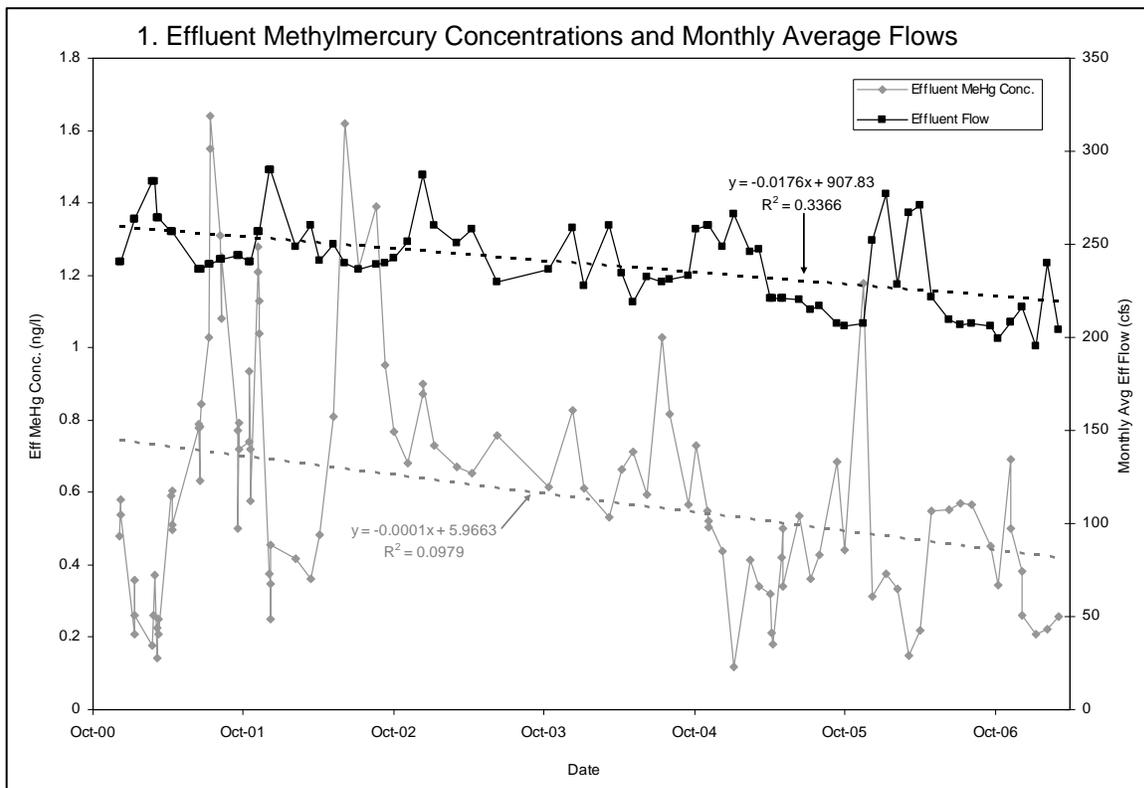
Cosumnes, Feather, Mokelumne Sacramento, and San Joaquin Rivers, and Marsh, Morrison and Putah Creeks).

4. Use of Goal as Limit

p.31-32 text and table 4.1 calculation of load reductions using 0.06 ng/L

The percent reductions in load are calculated from the ambient water column goal of 0.06 ng/L. In this regard, the goal is used as a limit by driving reductions to it. This formulation is inconsistent with the Basin Plan amendment statements about not using the goal as an effluent limit.

R-310: To clarify, the goal is not used as an effluent limit. As explained in more detail in the Board staff's responses to SRCSD's 9 April 2008 letter, the 0.06 ng/l goal for ambient Delta water is used to link methylmercury in Delta water to methylmercury in fish and it is used to determine how much methylmercury sources need to be reduced to achieve the proposed fish tissue objective. The USEPA requires that there be a linkage between the fish methylmercury objective and methylmercury sources. Staff does not recommend that 0.06 ng/l be used as an effluent or receiving water limit. Effluent limits will be based on the waste load allocations presented in the Basin Plan, which are loads, not concentrations. For example, methylmercury sources to the Sacramento River subarea of the Delta need to be reduced by 44% to achieve the assimilative capacity (0.06 ng/l), which corresponds to the proposed fish methylmercury objectives (please refer to Chapter 8 in the draft TMDL Report for a detailed explanation). Some minor nonpoint sources within the Sacramento River subarea have allocations set equal to their existing loads (e.g., atmospheric deposition and urban areas outside of MS4 service boundaries), which results in the other point and nonpoint sources needing to be reduced by slightly more than 44% (44.49%) to compensate. The proposed waste load allocation for the SRCSD Sacramento River WWTP (89 g/yr) was calculated by multiplying its existing methylmercury load (161 g/yr) by 55.51% (1 minus 44.49%). [For a detailed explanation of how the allocations are calculated for NPDES facilities, please refer to Section 8.1.3 in Chapter 8 of the draft TMDL Report.] If the SRCSD Sacramento River WWTP focused on achieving its allocation only by reducing its effluent methylmercury concentration and maintained its discharge at about 160 million gallons per day (the average discharge during the TMDL period, water years 2000 through 2003), it would need to reduce its effluent methylmercury concentration by about 44.49%, from its existing average concentration of 0.72 ng/l (as observed for December 2000 through June 2003, the data set used in the draft TMDL Report to estimate "existing" loads) to about 0.40 ng/l, which is substantially (more than six times) higher than the proposed goal for ambient Delta water. None-the-less, 0.40 ng/l will not be used as an effluent limit for the SRCSD Sacramento River WWTP. Only 89 g/yr would be used as the effluent limit. This load-based effluent limit could be met by reducing effluent methylmercury concentration, reducing effluent discharge volume, conducting an offset project if a legally viable offset program or other watershed approach is adopted during Phase 1, or some combination of these approaches. In fact, as noted in Board staff's responses to SRCSD's 9 April 2008 letter, the 2001-2007 effluent methylmercury and discharge volume data submitted by SRCSD for the SRCSD Sacramento River WWTP illustrate marked, statistically significant decreases in effluent methylmercury concentrations, discharge volumes, and effluent methylmercury loads with time (see Figure A). Board staff's calculations indicate that the SRCSD WWTP's average annual methylmercury discharge during recent years (2005-2007, ~95 g/yr) comes very close (e.g., within ~10%) to meeting staff's proposed allocation for the SRCSD WWTP (89 g/yr).



R-311: Figure A: SRCSD Sacramento River WWTP Effluent Methylmercury Concentrations, Monthly Average Flows, and Daily Effluent Methylmercury Loads for 2000-2007. The dashed lines represent the linear regressions between time and effluent concentrations, flows, and loads, which indicate statistically significant ($p < 0.05$) decreases in concentrations, flows, and loads over time.

5. Use of unpublished draft staff report

Multiple references to Bosworth et al., 2008, which is an unpublished, draft staff report.

Investigation of WWTP effluents should be done in collaboration with the WWTP community. There are likely erroneous assumptions and thus unsupported conclusions given in the staff report as a result of those assumptions. Any such speculations (for example, the bullet points on p.35) should be done in collaboration with CVCWA and presented, if at all, as hypotheses.

R-312: The Board staff report, “A Review of Methylmercury Discharges from NPDES Facilities in California’s Central Valley”, has since received extensive review by SRCSD and other dischargers. An administrative draft report was sent in December 2008 to all of the NPDES facilities whose data were summarized in the draft report. Staff addressed comments submitted for the December 2008 draft report and made the revised draft report available for public review in May 2009. Staff incorporated corrections and comments on the December 2008 and May 2009 draft reports into the final version of the report, which was completed in March 2010. Comments submitted by SRCSD and other facilities and staff responses are provided in Appendix D of the final report. The final report is available at the Board website: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/other_technical_reports/

6. Cache Creek Settling Basin requirements

p.71-73 presents detailed records of maintenance plans and options for increasing sediment / total mercury removal. The maintenance plan that the TMDL seems to rely on is being evaluated holistically.

Requiring “compliance” with that plan and full implementation of sediment trapping options considered by CDM (2004) compromises on-going flood control evaluations currently being developed by Yolo County and Sacramento Area Flood Control Agency (SAFCA).

R-313: The Cache Creek Settling Basin was constructed in 1937 by the U.S. Army Corps of Engineers (USACE) to contain sediment that would otherwise build up in Yolo Bypass and decrease its ability to protect the Sacramento region from flooding. The USACE turned over operation and maintenance of the basin to California Department of Water Resources (DWR) in 1994. SRCSD and other stakeholders have stated that the State of California should be responsible for inorganic mercury transported by and methylmercury produced in waters of the State. For example, in SRCSD’s 9 April 2008 comments, SRCSD wrote, “The bottom line is that the major sources of mercury loads to the Delta are “legacy” – related to gold mining going back to 1849. The sources of this “legacy” mercury are sediments in Waters of the State of California. It would seem appropriate that the State of California be allocated responsibility for this 75% portion of the identified methylmercury loading to the Delta.” Requiring the State to improve the trapping efficiency of the Cache Creek Settling Basin and reduce the amount of mercury-contaminated sediment leaving the Cache Creek watershed is one way of allocating responsibility to the State for reducing methylmercury produced by sediments in waters of the State.

R-314: During the formal stakeholder process after the April 2008 hearing meeting, Board staff worked with staff from DWR, Central Valley Flood Protection Board (another state

agency), USACE and other stakeholders to revise the schedule in the draft BPA to allow adequate time to initiate the process for Congressional authorization to modify the basin, evaluate the trapping efficiency of the Cache Creek Settling Basin, and work with the landowners within the basin and local communities affected by basin improvements to evaluate potentially feasible alternative(s) for mercury reduction from the basin, including the feasibility of decreasing mercury loads from the basin, up to and including a 50% reduction from existing loads; and develop a detailed strategy for improvements to the basin to decrease mercury loads from the basin.

R-315: Please refer to Board staff's responses to SRCSD's comments in "Comments on Draft Basin Plan Amendment" earlier in the 24 April 2008 letter, in particular, "Section: Cache Creek Settling Basin", for more detailed Board staff responses on this topic.

Furthermore, the action of requiring more from a beneficial structure removes the offset opportunity that SRCSD has been seeking.

R-316: As noted earlier, the Cache Creek Settling Basin is of particular importance because, even though the basin traps about half of the sediment-bound mercury that enters it from the Cache Creek watershed, discharges from the basin comprise the largest single source of mercury-contaminated sediment to the Delta. The sediment trapping efficiency of the basin will decrease as it fills. The basin will fill to its design capacity in about 35 years, and its trapping efficiency may reach zero in about 50 years, unless a maintenance program is established. At this time, no maintenance program to maintain the trapping efficiency or life of the basin is in place. It is imperative that a holistic strategy be developed to prevent the long-term increase of mercury discharges from the basin as well as to evaluate the feasibility of decreasing the mercury discharges from the basin.

R-317: The USACE constructed the Cache Creek Settling Basin and the DWR is responsible for the operation and maintenance of the basin. SRCSD will need to work with DWR and USACE to evaluate offset opportunities.

7. Offset Constraints

p.78 first bullet

Projects such as at the Cache Creek Settling Basin may provide sufficient offset credit even though they would not have measurable load reductions distinguishable beyond the noise in the inflow-outflow data.

Requiring documentation of load reductions needs to be broadened.

R-318: The first bullet on page 78 in the February 2008 draft BPA Staff Report was:

"Proposed projects will be evaluated and credits calculated based on estimates of reductions in loads of total mercury and/or methylmercury that would be expected to be achieved on an annual basis in the Delta or Yolo Bypass. The offset proponent must submit documentation on reductions in total mercury or methylmercury loading measured at the project site as well as reductions expected to be achieved in the Delta or Yolo Bypass."

During the formal stakeholder process, Board staff worked with SRCSD, CVCWA and other stakeholders to craft guiding principles for the development of Phase 1 pilot offset projects and a long-term offset program that would encourage the implementation of near-term projects to make near-term environmental improvements and generate useful scientific and policy data, as

well as give dischargers credit that would enable more compliance flexibility. The above bulleted text was broadened in the February 2010 draft BPA to: *“Creditable load reductions achieved should be real, quantifiable, verifiable, and enforceable by the Regional Board.”*

p.79: “For example, if a project proponent discharges to the San Joaquin subarea of the Delta, but implements a pilot project in the Cache Creek watershed, which discharges to the Yolo Bypass subarea, the pilot project would result in no improvement for the San Joaquin subarea.”

Restrictions such as this would have no beneficial effect on the environment. Recognizing that all permitted dischargers represent such a small fraction of the mercury load to the Delta, intra-subarea trading should not be inhibited by such restrictions.

Delete this example.

R-319: Text in the draft BPA Staff Report and draft BPA was revised to include the guiding principles developed during the formal stakeholder process. The guiding principles included in the February 2010 draft BPA do not require that pilot projects take place in the same watershed as the discharge. [Note, the guidance provided in the February 2008 draft BPA also did not require that pilot projects take place in the same watershed as the discharge.]

R-320: The example provided in the draft BPA Staff Report is not a restriction. It highlights a critical concern about the location of offset projects. Federal TMDL requirements necessitate that loading from all pollutant (e.g., methylmercury) sources must not exceed the loading (or assimilative) capacity of the Delta, including an appropriate margin of safety. As mentioned earlier and reviewed in the CEQA analysis (see Chapter 7, Section IV. Biological Resources, in the draft BPA Staff Report), if a discharger is allowed to use credit accrued from offset projects in other watersheds, the load and waste load allocations for sources upstream of the discharge would need to be adjusted to ensure that fish tissue objectives are achieved and maintained in compliance with Clean Water Act requirements for TMDLs. This factor must be considered by efforts to develop a long-term offset program during Phase 1

R-321: Board staff recognizes that permitted point source dischargers represent a relatively small fraction of all mercury inputs to the Delta. Board staff also recognizes that, given how many individual discharges there are in each point and nonpoint source category in the Delta, almost all of the individual discharges are small. And, although the tributary inputs are substantial, available information indicates that they also contain a similar distribution of individual discharges. Examples of small discharges include most wastewater treatment plants, individual farm fields, and wetlands where water flow is managed in discrete units. It is the sum of all of the individual discharges in the Delta and its tributary watersheds that impairs the Delta. Each of the individual discharges has its own intrinsic value and financial constraints.

R-322: Any long-term offset program must be open to both point and nonpoint sources. If an offset program were to allow all NPDES facilities to conduct long-term offset projects in watersheds different from their discharges, to be fair, nonpoint sources would almost certainly desire the same flexibility. Such flexibility could result in more immediate methylmercury and/or inorganic mercury reductions in high-priority areas such as the Yolo Bypass and Cosumnes River subareas, where there are very elevated fish methylmercury levels. However, enough reductions still need to occur in each watershed to ensure that fish tissue objectives are achieved and maintained in all areas of the Delta and its upstream tributaries in compliance with Clean Water Act requirements for TMDLs. The greater the number of dischargers that conduct

offset projects in watersheds different from their discharge, the more the remaining dischargers would need to reduce their discharges to compensate. This becomes an equitability concern.

R-323: Stakeholders, including Board staff, have committed to developing a long-term offset program and a more detailed offset credit strategy during Phase 1 of the proposed control program. These concerns can be further explored and addressed by the stakeholder process for the development of the offset program.

8. SRCSD References

p. 93, reference to "SRCSD Sacramento River WWTP" and "SRWWTP"

For consistency, references to SRCSD's main plant should be "SRCSD Sacramento Regional Wastewater Treatment Plant" or "SRWTP".

R-324: The draft staff reports and draft BPA consistently use the same name (SRCSD Sacramento River WWTP) and also reference the NPDES permit number to avoid confusion.

9. Attainment of Objectives

p.111 "Proposed fish tissue objectives are expected to be achieved under Alternatives 2 and 3."

pp.19-20: "Targeting methylmercury sources in addition to total mercury sources – by reducing methylmercury discharges or curtailing the methylation process – is expected to more rapidly reduce methylmercury concentrations in fish and enable full compliance with Alternatives 3 and 4."

Such statements are severely misleading to decision makers, implying that reducing small MeHg discharges will result in fish tissue attainment. A reasonable assessment of the TMDL is that it will have no beneficial impact on the Delta, given that it only addresses a small portion of the total mercury and methylmercury loads to the Delta and no one know how to achieve those reductions.

"Curtailing the methylation process" in 93% of the MeHg inputs to the Delta would be necessary to achieve at least 55% reduction in fish mercury levels (average reduction needed to meet criterion for TL3/TL4 fish). Even if ALL of the remaining 7% of the MeHg in wastewater, urban and agricultural runoff is demethylated (see first comment on Appendix A), methylation will still need to be "curtailed" in wetlands to get to ~25% MeHg reduction, still leaving ~75% of the MeHg in the environment not addressed under this TMDL. The approach outlined in this TMDL does not add up to attainment of desired fish tissue levels.

Since the success of this TMDL will rely on "curtailing the methylation process", the adverse effects of this proposed action on the environment must be studied and estimated BEFORE taking any action. Pilot study is needed.

R-325: Board staff provided extensive and detailed responses to this set of comments when they were also made in SRCSD's 9 April 2008 letter. Please refer to Board staff's response to "(1) The Delta Mercury TMDL Has NO Chance of Controlling the Most Significant Sources of Mercury", and "(2) At This Time, The Regional Board Should Re-Think Its Approach to Controlling ALL Forms of Mercury Affecting the Delta", SRCSD's first two comments in its attachment to the 9 April 2008 letter, provided earlier in this document.

10. Redesigning Treatment Plants to Minimize Methylmercury Concentrations

p.113: "These patterns indicate that it will likely be feasible to control methylmercury from some sources through design, management, and control options."

The only "control options" to consider are design and management, so "control options" seems redundant in this sentence.

R-326: Board staff typically uses the term "management" when referring to nonpoint sources and "control" when referring to point sources.

Contemplating that treatment plants could and possibly should be redesigned merely to potentially reduce methylmercury loads is what SRCSD and other POTWs fear in future permits. These high cost attempts at mercury reductions are not wise use of public resources as they would provide little to no measurable improvement in fish.

R-327: Board staff provided extensive and detailed responses related to this concern when a similar comment was made in SRCSD's 9 April 2008 letter. Please refer to Board staff's response to "(3) The 0.06 ng/L Water Concentration "Goal" Should Be Removed", SRCSD's third comment in its attachment to the 9 April 2008 letter, provided earlier in this document. In particular, please refer to Board staff's response to SRCSD's comment that "the 0.06 ng/L "goal" is something that probably cannot be met by a number of POTWs that discharge to the Delta, short of tearing down and rebuilding from scratch their entire biological treatment processes." Board staff expects that few if any facilities would need to rebuild their treatment systems from scratch to comply with their methylmercury waste load allocations (which are less onerous than, and not equal to, the proposed ambient water goal) for several reasons. These reasons are described in detail in the before-mentioned responses. To summarize: first, many facilities in the Delta and its tributary watersheds already have low effluent methylmercury concentrations. Second, as evidenced by the recent effluent monitoring results for the SRCSD and Stockton WWTPs, by focusing on reducing inorganic mercury and other pollutants in their discharges, some facilities may be able to achieve the methylmercury allocations proposed in the February 2010 draft BPA. Board staff's calculations indicate that SRCSD WWTP's average annual methylmercury discharges during recent years (2005-2007, ~95 g/yr) comes very close (within ~10%) to meeting staff's proposed allocation for the SRCSD WWTP (89 g/yr), and it is likely that the Stockton WWTP discharges would comply with the proposed allocation for its discharge if the decrease in its effluent methylmercury concentrations observed in January-July 2009 continue.

R-328: In addition, Board staff supports exploring alternative and creative watershed-focused approaches to reducing methylmercury and total mercury sources so that fish tissue objectives can be met in all areas of the Delta in a manner that best uses limited resources to maximize environmental benefits. As noted earlier, Board staff worked with SRCSD, CVCWA and other stakeholders during the formal stakeholder process to develop guiding principles for an offset program and pilot offset projects; these guiding principles are included in the February 2010 draft BPA and draft BPA Staff Report. In addition, Board staff is open to evaluating the concept of regional wasteload allocations for NPDES discharges (e.g., by Delta subarea and/or by tributary watershed) in a manner similar to that done by the San Francisco Bay Water Board.

A region-wide watershed permit (Order No. R2-2007-0077⁵⁵) was recently approved for municipal and industrial wastewater discharges of mercury to San Francisco Bay to implement the San Francisco Bay Mercury TMDL. The proposed Phase 1 Program Review would consider such alternative approaches before establishing implementation actions and compliance schedules for achieving the methylmercury allocations during Phase 2.

R-329: Also, the February 2010 draft BPA contains more detailed requirements for the Board to conduct a Phase 1 Program Review that considers the cost and effectiveness of potential methylmercury control alternatives identified by the Phase 1 methylmercury control studies. As noted earlier, the draft BPA now contains language developed with stakeholder input after the April 2008 hearing meeting that specifically states that methylmercury implementation actions would not be required to comply with the methylmercury load and waste load allocations until Phase 2, and that Phase 2 will not begin until the Central Valley Water Board has completed the Phase 1 Program Review.

11. Walnut Grove facility

Walnut Grove is scheduled to be decommissioned this year. A pipeline is being constructed to bring flows to SRWTP. We are not allowed to discharge past May 15, 2008. Courtland will also be shut down this year.

All requirements for the Walnut Grove facility should be removed. Any wasteload allocations given to that facility should be added to the SRWTP's totals.

R-330: All requirements for the Walnut Grove facility were removed from the draft BPA. Board staff worked with SRCSD, CVCWA and other stakeholders who participated in the NPDES Facility Workgroup, a component of the formal stakeholder process after the April 2008 hearing meeting, to develop a method for calculating allocations for facilities that take part in regionalization efforts. Please see Section 8.1.3 in Chapter 8 of the draft TMDL Report for the methods used to calculate allocations for such facilities (i.e., SRCSD Sacramento River WWTP and City of Lodi White Slough WWTP).

12. Revise the ambient monitoring to consider biosentinel fish

The CalFed Fish Mercury Project's biosentinel work from 2005-07, tells a somewhat different story than the draft TMDL regarding how mercury becomes bioavailable in the environment and biomagnifies in larger fish. This work suggests that biosentinel (native small) fish monitoring should be an alternative option in a RMP approach for ambient water mercury monitoring, as it more directly identifies actual mercury uptake into the food web and, over multiple years of comparable date, can be used to identify important watershed sources of mercury – targets for future offset projects.

R-331: To clarify, the CalFed Fish Mercury Project's biosentinel work provides more detailed information about seasonal and interannual variability in fish mercury levels, which can shed light on the timing of inputs from different sources. Staff agrees that biosentinel fish monitoring is useful for identifying sources of methylmercury and targets for future mercury control projects, including offset projects, and would be a useful component of a regional monitoring program (RMP). The proposed ambient monitoring program for the Delta methylmercury TMDL does not include requirements for a RMP. As noted in the document,

⁵⁵ Available at: http://www.swrcb.ca.gov/rwqcb2/board_decisions/adopted_orders/2007/november/8/r2-2007-0077final.pdf

“Staff’s Initial Responses to Board and Stakeholder Questions and Comments at the April 2008 Hearing” (see item 9, pages 32 and 33), stakeholders and Board staff have been discussing a regional monitoring program for multiple water quality constituents. Board staff will continue working with stakeholders to develop a coordinated monitoring plan for mercury, possibly through the broader monitoring program that is being considered for the Delta.

R-332: The proposed ambient monitoring program does already include the following requirements for assessing compliance with the proposed fish tissue objective for small fish, which encompass small biosentinel fish:

“Compliance fish methylmercury monitoring will include representative fish species for comparison to each of the methylmercury fish tissue objectives: ... Small (<50 mm) fish: primary prey species consumed by wildlife in the Delta, which may include the species listed above, as well as inland silverside, juvenile bluegill, mosquitofish, red shiner, threadfin shad, or other fish less than 50 mm. ... Sample sets for fish less than 50 mm will include at least two fish species that are the primary prey species consumed by wildlife at sensitive life stages. In any subarea, if multiple species for a particular trophic level are not available, one species in the sample set is acceptable.”

Appendix A. TMDL Staff Report

p.iv, p.63+: ***The linkage analysis only addresses the linkage between concentrations in water and fish, whereas the implementation plan addresses the linkage between methylmercury sources and concentrations in water.***

The implementation plan presumes that methylmercury source controls will directly reduce mercury levels in fish in the Delta. The resulting methylmercury wasteload and load allocations based on this incomplete linkage analysis misrepresent our ability to control mercury levels in fish.

R-333: Staff recognized in the draft staff reports that the aqueous concentration of methylmercury at any site or time is the result of the interaction of multiple factors, including methylmercury production and degradation. The proposed Basin Plan amendment divides the Delta into subareas based on the hydrologic characteristics and mixing of source waters. By using existing methylmercury concentrations and water movement patterns when determining methylmercury allocations for the eight Delta subareas, staff has taken into account the different factors affecting methylmercury. A network of methylmercury measurements on the major tributaries as they entered the Delta and at locations within the Delta show how average methylmercury concentrations change as water moves across the system. The allocations for methylmercury sources in each subarea are based on conditions observed in each subarea from actual in-stream measurements and so incorporate non-conservative changes in methylmercury concentrations. Available data indicate that reducing loads of methylmercury to any subarea will result in lower concentrations of methylmercury in water and biota in that area.

R-334: For example, in its Localized Mercury Bioaccumulation Study,⁵⁶ SRCSD concluded that SRCSD WWTP effluent contributes about the same percentage of

⁵⁶ SRCSD. 2008. Localized Mercury Bioaccumulation Study. Final report prepared for Sacramento Regional County Sanitation District (SRCSD) by Larry Walker Associates in association with Applied Marine Sciences, Studio Geochimica, and University of California, Davis. March 2008.

methylmercury to Sacramento River biota downstream of its discharge as it does to the methylmercury loading in the river. SRCSD found that four out of six fish and clams species sampled had methylmercury concentrations about 10% greater downstream from the discharge than upstream. The ratio of SRCSD WWTP methylmercury loads to river methylmercury loads was also about 10% during the study period. There is no information that suggests that methylmercury discharged into a water body would disappear so rapidly that none of it would be accumulated, at least in part, into the food chain immediately downstream of the discharge.

The TMDL should recognize that, in the ambient environment, there is a dynamic equilibrium between total and methyl mercury such that reducing methyl mercury concentrations (i.e., demethylating methylmercury without changing total mercury concentrations) in discharges may have no impact on methyl mercury concentrations in the Delta.

R-335: CVCWA made equivalent comments in its 9 April 2008 letter. Available information, including the results of the before-mentioned Localized Mercury Bioaccumulation Study conducted by SRCSD, indicates that reducing methylmercury concentrations in discharges (assuming no increase in discharge volume) would decrease methylmercury concentrations in the Delta. Board staff provided a detailed, multi-page response regarding the concept of equilibrium chemistry, the at-times non-conservative nature of methylmercury in ecosystems, and whether making source reductions will achieve the proposed fish tissue objectives. Please refer to Board staff's response to CVCWA's comments earlier in this document.

Include a Phase 1 study to: 1) determine why the central Delta aqueous methylmercury concentrations are so low, and 2) model equilibrium chemistry in the tributaries to determine if removing small sources of methyl mercury will impact in-stream methylmercury concentrations.

R-336: As described in detail in Board staff's responses to comments in CVCWA's 9 April 2008 letter, and in Chapter 3 of the February 2010 draft TMDL Report, the results of recently completed CalFed studies (Stephenson *et al.*, 2008⁵⁷) indicate that in the Central Delta, net methylmercury concentrations (resulting from the combination of source inputs plus loss processes) may be dominated by methylmercury removal from the water column. Concentrations of methylmercury are lower in the Central Delta, relative to the Delta periphery and in tributaries. The removal of methylmercury from the water column is due to a combination of processes, primarily breakdown of methylmercury by light (photodegradation) and attachment to particles and settling (Stephenson *et al.*, 2008). Breakdown of methylmercury by bacteria, and uptake into biota also likely contribute to methylmercury loss in the Delta. The Central Delta subarea is not considered impaired due to methylmercury.

R-337: In the Sacramento River, methylmercury appears to be relatively conservative. Concentrations of methylmercury increase with distance downstream in the Sacramento River. The sums of methylmercury loads in the Sacramento River at Colusa and loads from the major tributaries (Colusa Basin Drain, Feather River, and American River) closely match the loads in the Sacramento River downstream at Freeport (Stephenson *et al.*, 2008).

⁵⁷ Stephenson, M., C. Foe, G.A. Gill, and K.H. Coale. 2008. Transport, Cycling, and Fate of Mercury and Methylmercury in the San Francisco Delta and Tributaries: An Integrated Mass Balance Assessment Approach. CALFED Mercury Project Final Report. Available at: <http://mercury.mlml.calstate.edu/reports/reports/>

R-338: Methylmercury concentrations decrease down the San Joaquin River between Fremont Ford and Vernalis, the legal boundary of the Delta (Stephenson *et al.*, 2008). Average methylmercury concentrations in the San Joaquin River between Fremont Ford and Patterson ranged between 0.30 and 0.27 ng/l. Concentrations at Vernalis decreased to 0.19 ng/l. The decrease is significant ($P < 0.0001$, Kruskal-Wallis test). The primary sources of water in the upper basin are the San Joaquin River at Lander Avenue and Salt and Mud Sloughs. All tributary inputs, except Mud Slough, have methylmercury concentrations similar to the San Joaquin River. Mud Slough had the highest average methyl mercury concentration (0.92 ng/l) of any tributary in the San Joaquin Basin. Discharge from these three subbasins (San Joaquin River at Lander Avenue and Salt and Mud Sloughs) likely explains the elevated methylmercury concentrations in the upper San Joaquin River. In contrast, the primary sources of water to the lower San Joaquin River are the Merced, Tuolumne and Stanislaus Rivers. Together these three provided more than 70% of the flow at Vernalis. Methylmercury concentrations in the three eastside rivers were the lowest of any water source measured in the San Joaquin Basin (0.09 to 0.12 ng/l). The CalFed study authors stated that the decrease in methylmercury concentrations in the San Joaquin River between Patterson and Vernalis is most easily explained as dilution by the Tuolumne and Stanislaus Rivers.

R-339: If methylmercury were being formed, degraded, and reformed as quickly as SRCSD's equilibrium chemistry belief would imply, the Sacramento and San Joaquin Rivers and Central Delta would not show such consistent patterns of methylmercury concentrations and loads over time and space. Such consistent patterns in methylmercury concentrations and loads, along with knowledge of methylmercury production and loss processes and the results of SRCSD's Localized Mercury Bioaccumulation Study, indicate that reducing sources of methylmercury will reduce in-stream methylmercury concentrations.

R-340: Please refer to Board staff's detailed responses to SRCSD comments in the following pages for an explanation of why making reductions in many small sources in some watersheds may be needed to address the impairment in those watersheds and in all areas of the Delta.

1. The TMDL linkage analysis needs to estimate a realistic goal for background levels in fish.

The TMDL does not indicate a background, attainable level of methylmercury in water or in fish. A responsible assessment of attainability of this TMDL depends on a clear sense of the magnitude of change to achieve a potential target. Background concentrations of total mercury and methylmercury are not given, obscuring the uncontrollable nature of some major sources and local conditions.

The lowest levels found in the central Delta are not the same as background levels elsewhere. Other factors such as salinity, temperature and ecology influence the relationship between mercury in water and in fish.

R-341: The USEPA requires that Board staff show that the TMDL has a "reasonable assurance" of being achieved. Staff expects that water quality objectives based on consumption of 32 g/day of trophic level 3 and 4 fish (one meal a week of local fish) will be met but that lower objectives may not be reached. Staff recognizes that a variety of factors such as salinity, temperature and ecology influence the relationship between mercury in water and in fish. To address such a variety of factors, staff considered possible Delta fish tissue methylmercury objectives with respect to both (a) the observation that fish mercury concentrations in the Central Delta approach or already achieve the proposed objectives and

(2) the results of a survey of mercury concentrations in fish from 626 sites in 12 western states, including areas not affected by mercury and gold mining.⁵⁸ About 30% to 40% of the sampled waterways in 12 western states supported a fish population with mercury concentrations lower than the proposed fish tissue objectives for the Delta, which indicates that the proposed objectives may be attainable with implementation of a vigorous control program. Atmospheric deposition of mercury from the global pool and natural background concentrations of mercury in soil produce a base level of mercury in fish. Because the Delta's exact baseline is uncertain, staff recommends setting a water quality objective that has evidence of being achieved, rather than setting it at levels corresponding to consumption rates for the highest consumers (e.g., four to five meals a week of trophic level 4 fish such as bass and catfish).

R-342: Section 8.2 of the February 2010 draft TMDL Report provides a preliminary scoping of potential watershed total mercury load reductions that incorporates estimates of background suspended sediment mercury concentrations. However, it is important to note that the proposed TMDL implementation approach focuses on "controllable processes" (see Chapter 3 in the draft TMDL Report), not some determination of background levels of inorganic mercury or methylmercury in ambient water. Focusing on controllable processes is expected to increase the number of control options at our disposal and enable more rapid improvements.

The current plan risks spending billions of dollars with no evidence to predict success or even of measurable improvement.

R-343: To address this risk, an adaptive implementation strategy was proposed in the February 2008 draft BPA that would allow for the modification of the control program based on new information at the end of Phase 1, before implementation of methylmercury controls would be required to comply with those allocations. This approach was further developed by the formal stakeholder process (in which SRCSD participated extensively) and the February 2010 draft BPA now contains more detailed language describing the adaptive management approach as well as more detailed requirements for the Board to conduct a Phase 1 Delta Mercury Control Program Review. The draft BPA language specifies that the Board would assess during the Program Review the effectiveness, costs, potential environmental effects, and technical and economic feasibility of potential methylmercury control methods, and whether methylmercury allocations can be attained. If a legally viable offset program or other watershed or regional allocation approach cannot be developed during Phase 1, then the Board can modify the allocations during its Program Review to address feasibility, cost effectiveness, and potential environmental benefits and impacts associated with potential methylmercury control options for individual dischargers. Implementation of methylmercury management practices identified in Phase 1 would not be required for the purposes of achieving methylmercury allocations until the Board has completed the Phase 1 Program Review.

R-344: As reviewed in more detail in the TMDL Report (Chapters 3 and 6), recent studies indicate substantial variability in methylmercury levels in discharges from different types of WWTPs throughout the Central Valley, different soil types and management practices on farmed Delta Islands, and different types of wetlands in the Delta, Suisun Bay, Cache Creek watershed, and Mud and Salt Sloughs in the upper San Joaquin River watershed. This variability implies that technologies or management practices may be able to reduce

⁵⁸ Peterson, S. A., J. Van Sickle, A. T. Herlihy, and R. M. Hughes. 2007. Mercury concentration in fish from streams and rivers throughout the western United States. *Environmental Science and Technology*, 41: 58-65.

methylmercury production from some sources. In addition, the initial monitoring results for a municipal WWTP in the Delta that recently made treatment and operation upgrades indicate that some upgrades might lead to reductions in multiple pollutants (e.g., ammonia, total mercury, and methylmercury) (see Chapter 6 in the TMDL Report for more discussion).

R-345: Also, the Santa Clara Valley Water District's pilot project to reduce methylmercury in Lake Almaden in the Guadalupe Watershed has shown very positive results.⁵⁹ Levels of methylmercury in the water column of Lake Almaden decreased significantly (e.g., a greater than 96% decrease in unfiltered methylmercury in water in 2006 from 2005 levels) after the Santa Clara Valley Water District installed solar-powered water circulators. Aeration has not been specifically tested in the Delta as a measure to reduce methylmercury concentrations, but may be effective in some situations, such as dredged material settling ponds or wet detention basins in urban areas.

R-346: Given available information, staff does not consider it unreasonable for the Central Valley Water Board to require dischargers to conduct control studies as a component of Phase 1 of the Delta mercury control program. As summarized in Table 4.4 in the February 2010 draft BPA Staff Report and explained in detail in Appendix C, Board staff estimated that Phase 1 methylmercury control studies could cost between \$5.5 million and \$14.7 million, an amount comparable to (but less than) the cost of the CalFed Mercury Program studies that focused on the characterization of methylmercury sources and processes but did not focus on developing methylmercury management practices. It is not reasonable to expect that the Phase 1 methylmercury control studies could require spending "billions of dollars". The adaptive management approach incorporated in the control program will enable the control program to be modified based on new information, enabling the best use of limited resources to maximize environmental benefits when methylmercury controls are implemented to achieve allocations during Phase 2.

Requiring blanket reductions in all measurable sources is, while comprehensive, not a wise use of public funds. This approach fails to take into account the relative cost of mercury controls at various sources. In this failure, the TMDL does not yet consider the reasonableness of its blanket proposal.

R-347: To address this concern, the draft BPA language specifies that the Board would assess during the Phase 1 Program Review the effectiveness, costs, potential environmental effects, and technical and economic feasibility of potential methylmercury control methods, and whether methylmercury allocations can be attained. Implementation of pilot offset projects and adoption of a long-term offset program for Phase 2 would help balance potential inequities in the cost of implementing controls for different types of sources. In addition, Board staff is open to evaluating the concept of regional wasteload allocations and other creative watershed allocation approaches during the stakeholder process during Phase 1. If a legally viable offset program or other watershed or regional allocation approach cannot be developed during Phase 1, then the Board can modify the allocations during its Program Review to address feasibility, cost effectiveness, and potential environmental benefits and impacts associated with potential methylmercury control options for individual dischargers. Implementation of methylmercury

⁵⁹ Drury, D. 2007. Santa Clara Valley Water District. Reduction of methyl mercury concentrations in an urban lake using a solar-powered circulator. Presentation at the 2007 Annual International Symposium of the North American Lake Management Society. October. <http://www.nalms.org/Conferences/Orlando/PDF/Orlando2007Program.pdf>

management practices identified in Phase 1 would not be required for the purposes of achieving methylmercury allocations until the Board has completed the Phase 1 Program Review.

R-348: The load and wasteload allocations included in the draft Basin Plan amendments assign an equitable distribution of responsibility between point and nonpoint sources within the Delta and inputs from the Delta's tributary watersheds. With only a few exceptions (see Chapter 8 in the February 2010 TMDL Report), point and nonpoint source discharges are assigned an equal percent reduction by the allocations. This approach is reasonable, given both the federal requirements for TMDLs and the high number of small individual sources. Staff supports the concept of linking the level of resources required for methylmercury control implementation to the relative magnitude of the source; however, without the completion of the Phase 1 methylmercury control studies, it is not yet possible to define which sources are "important" or "insignificant" or which are feasible or make sense to control. When discussing the importance of different sources, many stakeholders have focused on the amount of loading by source category (e.g., wetlands versus WWTPs). However, staff recommends that additional factors be considered. Given how many individual discharges there are in each source category in the Delta, almost all of the individual discharges are small. And, although the tributary inputs are substantial, available information indicates that they also contain a similar distribution of individual discharges. Examples of small discharges include most wastewater treatment plants, individual farm fields, and wetlands where water flow is managed in discrete units. It is the sum of all of the individual discharges in the Delta and its tributary watersheds that impairs the Delta. Each of the individual discharges has its own intrinsic value and financial constraints. As a result, the "importance" or "insignificance" of different methylmercury and total mercury sources could be defined by: (a) their load amount, (b) their distance from an impaired area, (c) how big of a reduction is needed to achieve safe fish mercury levels in a given impaired area, (d) whether they can be controlled, (e) whether they can be controlled without impacting habitat function, (f) the cost to control them, and (g) the resources available to the responsible parties to implement controls. It is likely that the Delta and tributary control programs will need to focus on just a few large projects in some watersheds, but many small projects in other watersheds, to achieve safe fish mercury levels throughout the Delta and impaired reaches in the upstream watersheds.

R-349: For example, the Sacramento River is the largest river in California and drains a 27,000 square-mile area – almost one fifth of the State of California and about one half of the Central Valley. It is not surprising that two of the largest individual methylmercury inputs to the Delta identified in the TMDL Report (Cache Creek Settling Basin [137 g/yr] and SRCSD Sacramento River WWTP [161 g/yr]; see Tables 6.2 and 6.5 in the February 2010 TMDL Report) are each only about 7% and 8%, respectively, of the Sacramento River's input to the Delta at Freeport (2,026 g/yr during the relatively dry WY2000-2003 TMDL period). However, as noted as early as 1997 in the Sacramento River Mercury Control Planning Project report prepared for SRCSD by Larry Walker Associates, "... mercury sources in the study area appear to be diffusely distributed without any significant "hotspots" ..." (LWA, 1997, page 31). This is expected to be true for both methylmercury and inorganic mercury sources in the Sacramento River watershed and other watersheds that drain to the Delta. As a result, until the proposed Phase 1 methylmercury control studies have been completed, it is reasonable to assign equal percent reductions to all point and nonpoint sources.

R-350: The February 2008 draft BPA and TMDL staff reports provide a detailed justification of the allocation approach. The approach was further summarized and discussed in

the April 2008 hearing meeting and in the follow-up document, “Staff’s Initial Responses to Board and Stakeholder Questions and Comments at the April 2008 Hearing”⁶⁰ (see item A-1). USEPA scientists concluded in their written comments that the “TMDL and loading capacity analyses, and the load and wasteload allocations are reasonable” (USEPA comments are provided later in this document).

Before implementing wasteload and load allocations in Phase 2, commit to expanding the linkage analysis to estimate background levels of mercury and to quantify the linkages between mercury sources and methyl mercury concentrations in water.

R-351: As noted earlier, the TMDL implementation approach focuses on “controllable processes” (see Chapter 3 in the draft TMDL Report), not some determination of background levels of inorganic mercury or methylmercury in ambient water. Focusing on controllable processes is expected to increase the number of control options at our disposal and enable more rapid improvements.

R-352: CVCWA made similar comments in its 9 April 2008 letter regarding the linkage between methylmercury sources and methylmercury concentrations in ambient Delta water. Available information, including the results of the before-mentioned Localized Mercury Bioaccumulation Study conducted by SRCSD, indicates that reducing methylmercury concentrations in discharges (assuming no increase in discharge volume) would decrease methylmercury concentrations in the Delta. Board staff provided a detailed, multi-page response regarding the concept of equilibrium chemistry, the at-times non-conservative nature of methylmercury in ecosystems, and whether making source reductions will achieve the proposed fish tissue objectives. Please refer to Board staff’s response to SRCSD’s and CVCWA’s comments earlier in this document.

2. SRCSD’s SRWTP loads

p. 90-91 tabulated loads for POTWs, including SRWTP

The Table and note (h) indicate that SRWTP collected concentration data from 2000 to 2003. In fact, SRWTP has a monthly record beginning in 2000 and continuing to date. Was the abbreviated period’s data used for comparability / consistency in the table?

R-353: Yes, the 2000-2003 period’s data were used for consistency in the Table 6.5 and Table 6.2, which compares average annual methylmercury load inputs from point and nonpoint sources within the Delta/Yolo Bypass and tributary inputs during water years 2000 through 2003, the period that encompasses the methylmercury concentration data for the major Delta inputs and exports available at the time the TMDL was developed. As noted earlier, Board staff recognizes that methylmercury loads in SRWTP discharges have decreased substantially since then, so much so that the more recent discharges (2005-2007, ~95 g/yr) come very close (e.g., within ~10%) to meeting staff’s proposed allocation for the SRWTP (89 g/yr).

⁶⁰ Available at:
http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/stakeholder_meetings/25nov08_hearing_rtc.pdf

Appendix C. Background

1. References

None of the appendices include the references used in the text.

Each appendix may need its own reference section.

R-354: All references cited in Appendix C are included in Chapter 9 (References) of the draft BPA Staff Report. A sentence was added to the introduction text to inform the reader where references are listed.

2. Requirements for Sacramento Combined WWTP

p. C-16: Tabulates monitoring requirements for this unique WWTP

This facility operates during wet weather events only. Quarterly sampling is ambiguous because half the year there is not even the potential for discharge. Furthermore, requiring receiving water monitoring associated with this facility would be extremely problematic. Discharges occur during wet weather, when available workers are generally occupied with addressing storm-related events.

Reconsider requiring any additional monitoring for this WWTP.

R-355: Board staff recognizes that quarterly sampling may not be appropriate for this facility and removed specific requirement for such monitoring. Further, Board staff worked with SRCSD and other stakeholders during the formal stakeholder process after the April 2008 hearing meeting to draft more flexible monitoring requirements that do not include any requirements for receiving water monitoring. The following text is included in the February 2010 draft BPA:

“During Phase 1 and Phase 2, NPDES facilities listed in Table B shall conduct effluent total mercury and methylmercury monitoring starting by [one year after the Effective Date]. Monitoring frequencies shall be defined in the NPDES permits. Effluent monitoring requirements will be re-evaluated during the Delta Mercury Control Program Reviews.”

3. Overall Cost Assumptions

p. C-17 costs

The tabulated costs are expressly for additional costs. This format does not recognize all that dischargers are already spending on mercury-related issues, diverting limited resources from other activities. For example, SRCSD’s in-plant methylmercury mass balance study cost approximately \$160,000, which is more than double the estimate given on p.C-14.

Calfed’s mercury strategy states that “The goal of the mercury strategy is to provide a unifying framework for the integrated investigations needed to build a scientific foundation for ecosystem restoration, environmental planning, and the assessment and eventual reduction of mercury-related risks in the Bay-Delta ecosystem... Each core component addresses one or more management goals and includes specific, supporting objectives pertaining to scientific activities (research and monitoring), management actions, or both. Management actions include source remediation, risk communication, ecosystem restoration, and landscape management.” To date, approximately \$30 million has been spent in this effort, yet no one would say that the goals have been met. That

budget level is a reasonable expectation of the funding needed to really address this TMDL's Phase 1 characterization and control study requirements.

This section should recognize that (1) SRCSD has spent approximately \$4 million on mercury-related efforts required by our current NPDES permit and to prove viability of offsets and (2) Calfed has spent over \$30 million and still has not provided answers to basic scientific questions that managers need.

R-356: The format of the cost estimates purposely focuses on those costs that would be incurred for activities not already required under existing regulations and permits, that is, only costs associated with adoption of the proposed mercury control program are included. This is done so that decision-makers responsible for adopting and approving a control program can consider new costs that would be incurred by implementing the control program, and so that entities potentially responsible for studies and other implementation actions have a starting point for estimating the amount of funds that will be needed for implementation activities.

R-357: As explained in Appendix C, Board staff estimated that analytical expenses for previous fate and transport studies conducted by SRCSD and the San Jose/Santa Clara Water Pollution Control Plant cost about \$70,200 and \$512,000, respectively, based on the information cited in their study reports (e.g., number of sample dates and waste stream and sludge samples collected and types of analyses performed) and the assumption that the laboratory analyses were conducted by contracted laboratories. SRCSD noted in the above comment that its in-plant methylmercury mass balance study cost approximately \$160,000, which still falls on the low side of Board staff's estimated range (\$70,200 to \$512,000). Board staff estimated that overall Phase 1 control study costs could range from about \$500,000 to \$1.3 million, which is based on the assumption that Phase 1 studies would both build on information from past monitoring efforts and include additional monitoring.

R-358: Board staff recognizes that additional funds will be needed to implement the Delta mercury control program. Board staff included a review of economic factors as part of the environmental analysis in Chapter 7 of the draft BPA Staff Report (see Section 7.4) that recognizes the potential economic impact of municipalities possibly needing to decrease other services in order to shift financial resources towards conducting studies and implementing additional best management practices and source controls to reduce mercury discharges. The draft BPA incorporates several components that were developed with input from SRCSD and other stakeholders during the formal stakeholder process after the April 2008 hearing meeting that may enable parties responsible for conducting studies and implementing monitoring and control actions to reduce economic impacts:

- The draft BPA incorporate a phased, adaptive management approach for the implementation of the proposed Delta mercury control program that includes evaluating additional information as it becomes available and adapting the control program so that effective and efficient actions can be taken that minimize the potential for adverse environmental and economic effects. The proposed amendments include language that commits the Board to conducting a "Delta Mercury Control Program Review" after the Phase 1 studies are completed and TMDL control programs for the major tributary inputs are developed. The Program Review includes assessing:
 - The effectiveness, costs, potential environmental effects, and technical and economic feasibility of potential methylmercury control methods;

- Whether implementation of some control methods would have negative impacts on other project or activity benefits;
 - Methods that can be employed to minimize or avoid potentially significant negative impacts that may result from control methods;
 - Implementation plans and schedules proposed by the dischargers; and
 - Whether methylmercury allocations can be attained.
- As part of the Program Review, the Board could consider modifications to the Delta mercury control program, including potential modifications of the allocations so that sources without feasible and reasonable methylmercury control methods may have their allocations adjusted to a feasible level, and sources that can more readily implement feasible and reasonable methylmercury control methods may be required to make greater reductions.
 - The proposed amendments include specific language that allows dischargers to conduct control studies using a stakeholder group approach or other collaborative mechanism, instead of requiring individual studies.

R-359: The proposed amendments include specific language that allows pilot offset projects to be developed and includes a schedule for the development of a long-term mercury (inorganic and/or methyl) offsets program with an overall objective of providing more flexibility than the current regulatory system provides to improve the environment while meeting regulatory requirements (i.e., load and wasteload allocations) at a lower overall cost. In addition, Board staff supports exploring alternative and creative watershed-focused approaches during Phase 1 to reducing methylmercury and total mercury sources so that fish tissue objectives can be met in all areas of the Delta in a manner that best uses limited resources to maximize environmental benefits.

R-360: The study goals of the CalFed mercury studies focused primarily on characterization of methylmercury sources and processes. Board staff recognizes that additional funding will be needed to complete methylmercury control studies. Staff updated the cost estimates to reflect stakeholder input provided during the formal stakeholder process and to reflect the completion of several methylmercury studies in the Delta region between February 2008 and January 2010. Please refer to Tables 4.4 and 4.5 in Chapter 4 of the draft BPA Staff Report for updated summaries of Phase 1 control study costs.

The cost estimate range should consider the possibility that dischargers may, for a variety of potential reasons, not be able to conduct collaborative studies. Costs for SRCSD and other POTWs could end up in this range over the Phase 1 implementation period. In that the goal of the Calfed mercury strategy is similar to that of this TMDL, the high estimate of costs that this TMDL would cause POTWs and other dischargers in the Delta region to incur could be more like \$30 million over the Phase 1 period, with no guarantee that further research into controls will yield meaningful management options that attain the desired levels in fish. Use attainability must be addressed to know if fish goals are appropriate or if risk management is needed in perpetuity.

R-361: During the formal stakeholder process, many stakeholders (e.g., CVCWA) expressed strong interest in developing coordinated and collaborative studies, such that it is reasonable to assume that most dischargers will participate in a coordinated effort.

R-362: Board staff provided extensive and detailed responses that explain why further research into methylmercury controls is expected to yield meaningful management options that

attain the desired levels in fish when a similar concern was stated in SRCSD's 9 April 2008 letter. Please refer to Board staff's response to "(1) The Delta Mercury TMDL Has NO Chance of Controlling the Most Significant Sources of Mercury", and "(2) At This Time, The Regional Board Should Re-Think Its Approach to Controlling ALL Forms of Mercury Affecting the Delta", SRCSD's first two comments in its attachment to the 9 April 2008 letter, provided earlier in this document.

R-363: A Use Attainability Analysis is not possible until the proposed Phase 1 methylmercury control studies have been completed. The adaptive strategies outlined in both the February 2008 and February 2010 draft BPAs were designed to encompass the need for additional tributary source analyses and methylmercury control studies, and to allow the Delta control program and associated fish tissue objectives, linkage and allocations to be modified as new scientific and management information becomes available. This approach was further developed by the formal stakeholder process after the April 2008 hearing meeting and the February 2010 draft Basin Plan amendments now contain more detailed language describing the adaptive management approach as well as more detailed requirements for the Board to conduct a Phase 1 Program Review. During the Phase 1 Program Review, the Central Valley Water Board can consider modifying wasteload allocations and/or fish tissue objectives based on the results of the Phase 1 studies and other new scientific and management information.

C-17: Effect of concentration limits "The proposed facility-specific methyl mercury concentration limits for existing facilities are based on data derived from conditions that represent normal operational conditions. The limits would not require the facilities to implement any new processes as long as the facilities maintain the efficiency of existing treatment processes and pretreatment programs."

R-364: In response to input from stakeholders before and after the April 2008 hearing meeting, the draft BPA language no longer contains performance-based, Phase 1 interim effluent methylmercury concentration limits; instead the February 2010 contains performance-based, Phase 1 interim effluent total mercury mass limits. Appendix C was updated to reflect this change.

This text does not address (1) the 0.06 ng/L "goal" that would eventually be interpreted as an effluent limit nor (2) the final wasteload allocation which could require caps that could only be met with concentration reductions. Both cases contradict the presumption that no new treatment process would be needed. For a plant our size to go to advanced treatment, it could cost our community anywhere from \$1.3 billion dollars for microfiltration and UV to over \$3 billion dollars if we were to go to reverse osmosis – which could potentially double or triple our rates.

R-365: The text in this appendix section intentionally addresses only potential costs associated with Phase 1 limits, not implementation of controls to comply with allocations during Phase 2. Such potential costs are evaluated in later sections of the appendix.

R-366: As noted earlier, Board staff does not recommend that 0.06 ng/l be used as an effluent or receiving water limit, and removed it from the draft BPA to help avoid confusion and lessen the fear that it could be accidentally and improperly used as an effluent limit. Board staff provided a detailed response to SRCSD's concern about the goal being used as an effluent limit when the concern was first mentioned in SRCSD's 9 April 2008 letter. Please refer to Board staff's responses to SRCSD's comment, "(3) The 0.06 ng/L Water Concentration "Goal" Should Be Removed", SRCSD's third comment in its attachment to the 9 April 2008 letter, provided earlier in this document.

R-367: Board staff also explained in earlier responses to SRCSD's 9 April 2008 comment, "(3) The 0.06 ng/L Water Concentration 'Goal' Should Be Removed", how there are potentially multiple methods to reducing effluent methylmercury loads. Implementing new treatments to reduce effluent methylmercury concentrations is one potential method. Another method could be to reduce discharge volume (e.g., by water reuse or additional discharge to land). Also, effluent methylmercury levels may be reduced when facilities implement treatments and source control programs for other pollutants in their discharge. As noted in Board staff's responses to SRCSD's 9 April 2008 letter, the 2001-2007 effluent methylmercury and discharge volume data submitted by SRCSD for the SRCSD Sacramento River WWTP illustrate marked, statistically significant decreases in effluent methylmercury concentrations, discharge volumes, and effluent methylmercury loads with time. During the April 2008 Board hearing meeting for the Delta mercury control program, the SRCSD District Engineer testified that implementation of the Be Mercury Free Program to reduce inorganic mercury sources to SRCSD's WWTP resulted in reductions in both inorganic mercury and methylmercury discharges from the WWTP. Also, upgrades to the City of Stockton WWTP completed in September 2006 to meet new ammonia effluent limits and Title 22 (or equivalent) tertiary requirements appear to have led to substantial reductions in total mercury and methylmercury as well as ammonia. Please refer to the Board staff's detailed response to SRCSD's 9 April 2008 comment, "(3) The 0.06 ng/L Water Concentration 'Goal' Should Be Removed", SRCSD's third comment in its attachment to the 9 April 2008 letter, provided earlier in this document, for more information on this topic.

R-368: As noted in Board staff's response to SRCSD's 9 April 2008 comment, "(3) The 0.06 ng/L Water Concentration 'Goal' Should Be Removed", microfiltration and reverse osmosis are the two most expensive options of the four advanced treatment options identified by Carollo Engineers for removing chlorpyrifos, diazinon, lindane, and mercury (see Carollo Engineers' 2005 SRCSD Treatment Feasibility Study,⁶¹ Table 11). (Note, the Central Valley Water Board does not specify or mandate the actual means of compliance by which responsible entities choose to comply with the proposed allocations in the draft Basin Plan amendments or any other permit effluent limits.) As discussed in the previous Board staff responses, it may be possible that treatments designed to reduce other pollutants (e.g., ammonia) could also reduce methylmercury. Board staff does not anticipate that SRCSD or any other discharger would need to implement microfiltration or reverse osmosis solely for the purpose of reducing effluent methylmercury concentrations and/or loads. Also, advanced treatment may not be required to reduce effluent methylmercury levels. Not all secondary treatment facilities have elevated effluent methylmercury concentrations; for example, the San Jose/Santa Clara WWTP in the San Francisco Bay area makes use of a single-stage activated sludge process and has a secondary effluent methylmercury concentration of 0.04 ng/l.⁶² In addition, expensive upgrades to facility treatment processes may not be needed if aggressive pollutant minimization programs are implemented and maintained and/or if an effective and legally-viable long-term offset program or other watershed approach to complying with allocations is developed during Phase 1. Board staff supports exploring alternative and creative watershed-focused approaches to reducing methylmercury and total mercury sources so that fish tissue objectives can be met in all areas of the Delta in a way that best uses limited resources. In addition,

⁶¹ Carollo Engineers. 2005. Sacramento Regional County Sanitation District, Sacramento Regional Wastewater Treatment Plant, NPDES Permit NO. CA 0077682 Provision E.6 Treatment Feasibility Studies, Final. Carollo Engineers. Walnut Creek, CA. March 2005.

⁶² SJ/SC. 2007. *San Jose/Santa Clara Water Pollution Control Plant Mercury Fate and Transport Study*. Environmental Services Department, SJ/SC Water Pollution Control Plant. San Jose, CA. March 2007.

USEPA staff and Water Board staff are open to evaluating the concept of regional wasteload allocations for NPDES discharges (e.g., by Delta subarea and/or by tributary watershed) in a manner similar to that done by the San Francisco Bay Water Board. A region-wide watershed permit (Order No. R2-2007-0077⁶³) was recently approved for municipal and industrial wastewater discharges of mercury to San Francisco Bay to implement the San Francisco Bay Mercury TMDL. The proposed Phase 1 Program Review would consider such alternative approaches before establishing implementation actions and compliance schedules for achieving the methylmercury allocations during Phase 2.

C-22 to C-23: Cost and treatability estimates

The cost estimates used to arrive at expected increases in operations costs associated with complying with the TMDL are based on a number of highly uncertain assumptions about effluent concentrations associated with various treatment processes. These assumptions are based on an internal, draft staff report. SRCSD and other CVCWA members anticipate working collaboratively with the Regional Board to continue evaluating the apparent relationships between treatment trains and effluent methylmercury concentrations.

At this time the treatability and associated cost estimates should be severely qualified or removed altogether.

R-369: The “internal, draft staff report” to which SRCSD refers, “A Review of Methylmercury Discharges from NPDES Facilities in California’s Central Valley”, has since received extensive review by SRCSD and other dischargers. An administrative draft report was sent in December 2008 to all of the NPDES facilities whose data were summarized in the draft report. Staff addressed comments submitted for the December 2008 draft report and made the revised draft report available for public review in May 2009. Staff incorporated corrections and comments on the December 2008 and May 2009 draft reports into the final version of the report, which was completed in March 2010. Comments submitted by SRCSD and other facilities and staff responses are provided in Appendix D of the final report. The final report is available at the Board website:

http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/other_technical_reports/

R-370: Board staff expects to continue working collaboratively with SRCSD and other CVCWA members to continue evaluating the apparent relationships between treatment trains and effluent methylmercury concentrations.

R-371: Board staff is required to consider potential costs that may be associated with reasonably foreseeable methods of compliance with BPA requirements. Information available for a variety of treatments and pollutant source control options allows staff to develop a range of estimates for potential costs. Also, numerous stakeholders have requested that estimates be included. Uncertainties were described and qualifications were included throughout Appendix C.

p.C-69 through C-70: Expectation for risk reduction

⁶³ Available at: http://www.swrcb.ca.gov/rwqcb2/board_decisions/adopted_orders/2007/november/8/r2-2007-0077final.pdf

The text seems to imply that dischargers who are required to implement risk reduction efforts would cover the Delta region itself. SRCSD, if indeed required to take on the state's responsibility for risk reduction, would likely restrict its geographic focus to its service area and the reach of the Sacramento River just downstream of the SRWTP outfall. The costs associated with many such individual efforts could be higher than assumed yet would not provide the broad spatial coverage anticipated. Further, as the mercury legacy is a statewide problem and fish levels are not anticipated, under any control options, to be achieved anytime soon – decades to centuries. The need for risk reduction is statewide, and although fish advisories will vary with location, the State responsibility for participation in this risk reduction effort should be proportional to the contribution the waters of the state make to the impairment (75% MeHg – 98% THg).

Qualify the costs and increase the potential costs if all minor permitted dischargers were required to develop their own programs.

R-372: Board staff appreciates SRCSD's concern about the geographic coverage of the exposure reduction program and does not expect SRCS and other dischargers to "take on the state's responsibility for risk reduction". Board staff agrees with SRCSD and other dischargers that it doesn't make sense that dischargers individually should develop their own exposure management plans. This topic was discussed extensively during the formal stakeholder process after the April 2008 hearing meeting. Text in Appendix C, the draft BPA Staff Report, and the draft BPA were updated to reflect additional stakeholder input (including input from SRCSD) provided during the formal stakeholder process. The February 2010 draft BPA would create a collaborative effort that would be coordinated with members of local fishing and consumer communities, the State Water Board, Office of Environmental Health Hazard Assessment, California Department of Public Health, and local county health departments to develop and implement an effective strategy. The February 2010 draft BPA requires that dischargers contribute to the exposure reduction program. As described in the draft BPA Staff Report (see Section 4.3.1), staff will work with stakeholders to obtain other funding in order to have a more comprehensive program than would be possible through discharger funding alone. Possible additional sources of funds could include governmental or private grant programs, new bond or other state funds that allow spending on exposure reduction, and public health programs.

15. Sacramento Stormwater Quality Partnership

Letter date: 9 April 2008

From: Sherill Huun (City of Sacramento, Utilities) and Kerry Schmitz (County of Sacramento, DWR), on behalf of the Sacramento Stormwater Quality Partnership

Thank you for providing this opportunity to review the subject documents (hereafter "TMDL"). The full report includes proposed amendments to Basin Plan language, followed by several attachments explaining the amendments. Comments provided in this letter focus on the Basin Plan Amendment. These comments are submitted to you on behalf of the Sacramento Stormwater Quality Partnership.

We would like to preface our comments by saying that we, as environmental stewards in the Sacramento metropolitan area, have done much to understand and improve the quality of our stormwater discharges. Regardless of the fact that our urban stormwater contributes less than half of 1% of the mercury load to the Delta, we are committed to doing our part in reducing mercury impairment in the Delta. In the interest of prudent use of public funds as well as achieving real environmental benefits, it is our hope that we would not be required to spend our limited resources on activities that will have no measurable effect on those impairments.

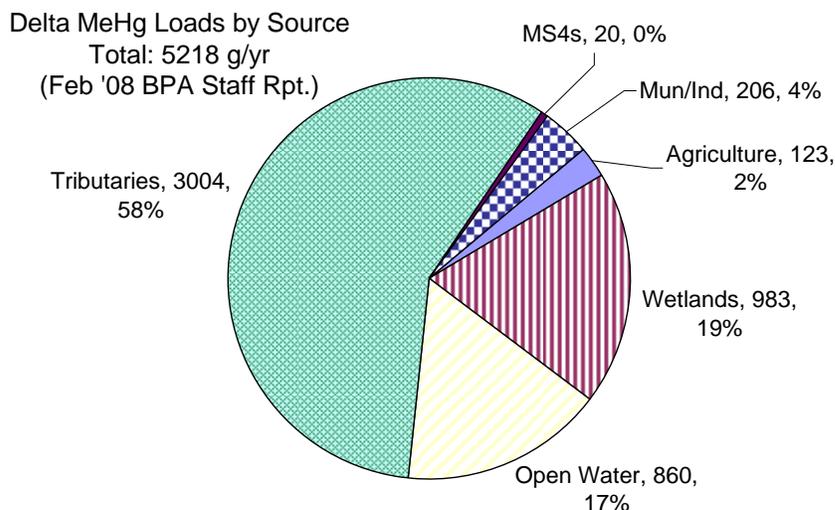
As described below, there are three important issues that we still wish to bring to the attention of the Regional Board:

- 1) The existing mercury load to the Delta must be addressed prior to implementing Phase 2 of this TMDL
- 2) The proposed controls for methylmercury will not reduce mercury concentrations in fish tissue; consider Minnesota approach
- 3) MS4 mercury control efforts must focus on total mercury; existing MS4 control efforts are MEP

R-373: To avoid redundancy, Board staff responds to the above comments after the corresponding detailed comments provided by the Sacramento Stormwater Quality Partnership in the following paragraphs.

1. The existing mercury load to the Delta must be addressed prior to implementing Phase 2 of this TMDL

Regulated sources of mercury such as municipal stormwater represent a small fraction of the overall mercury budget. The following pie chart from the TMDL demonstrates the relative magnitudes of methylmercury (MeHg) sources, where "MS4s" stands for municipal separate storm sewer systems and the percentages are rounded to the nearest whole number:



R-374: To clarify, the above pie chart's MS4 load (20 g/yr) corresponds to MS4 urban areas within the legal Delta and Yolo Bypass. Urban land use comprises a very small portion of the surface area in the Delta (about 55,600 acres out of more than 740,000 acres in the Delta/Yolo Bypass) and contributes only about 0.4% of the Delta methylmercury load (see Table 6.2 in the draft TMDL Report). In contrast, approximately 320,000 acres of urban land – about 42% of all urban area within the Delta source region – occur within 20 miles of the statutory Delta boundary, which is within about a one-day water travel time upstream. In addition, some of the urban watersheds outside the Delta discharge via sumps into Delta waterways. These discharges were not included in the Delta TMDL load estimate for MS4 urban areas within the Delta/Yolo Bypass.

R-375: The majority of the Sacramento MS4 service area is outside of the legal Delta. To evaluate the potential contributions from upstream urban lands, the methylmercury loading from the Sacramento MS4 service area was estimated (see Section 6.2.5 in the TMDL Report). The entire Sacramento MS4 service area contributes an annual methylmercury load of about 59 g/yr, which is about 3% of methylmercury loading in the Sacramento River at Freeport (2,026 g/yr; see Table 6.2 in the TMDL Report). For comparison, the SRCSD Sacramento River WWTP (the largest municipal WWTP in the Delta source region) discharges an annual methylmercury load of about 161 g/yr, which is about 8% of methylmercury loading in the Sacramento River at Freeport. These municipal discharges are expected to increase as urbanization continues around the Delta.

R-376: When discussing the importance of different sources, many stakeholders have focused on the amount of loading by source category (e.g., wetlands versus municipal discharges). However, given how many individual discharges there are in each source category in the Delta, almost all of the individual discharges are small. And, although the tributary inputs are substantial, available information indicates that they also contain a similar distribution of individual discharges. Examples of small discharges include most wastewater treatment plants, individual farm fields, and wetlands where water flow is managed in discrete units. It is the sum of all of the individual discharges in the Delta and its tributary watersheds that impairs the Delta. Each of the individual discharges has its own intrinsic value and financial constraints. As noted as early as 1997 in the Sacramento River Mercury Control Planning Project report prepared for SRCSD by Larry Walker Associates, "... mercury sources in the study area appear to be

diffusely distributed without any significant “hotspots” ...” (LWA, 1997, page 31). This is expected to be true for both methylmercury and inorganic mercury sources in the Sacramento River watershed and other watersheds that drain to the Delta.

The TMDL leaves the impression that the studies and potentially resulting controls implemented by NPDES dischargers will result in achieving the TMDL fish tissue targets; yet there is no plan or strategy to deal with the bulk of the mercury load. Focusing attention on minor sources, while 75% of the methylmercury sources (tributaries and open water) are not even addressed, is misleading to decision makers and ultimately will be ineffective in achieving reductions in fish tissue mercury concentrations. The Regional Board should have a plan for addressing the entire load of mercury to the Delta beyond simply allocating reductions to tributary watersheds.

R-377: The above comment and pie chart is identical to a comment and pie chart submitted by CVCWA in their 9 April 2008 letter. Please refer to Board staff’s detailed responses to CVCWA’s comment earlier in this document, for example, Board staff responses R-56, R-60, R-73, R-85, R-91 and R-93.

The mercury problem in our waterways stems from the gold rush in the late 1800s that contaminated streambeds and streambanks throughout the Sierra Nevada and Coastal Range, and thus generally has no identified responsible party. Consequently, the State, as the waterway caretaker, needs to address this share of the mercury impairment. The TMDL needs to allocate load reduction requirements to the State rather than passing it on to minor sources.

Recommendations:

- **Revise Phase 1 of the TMDL to include an overall strategy for the Regional Board completing over 45 mercury TMDLs for the multiple water bodies tributary to the Delta (based on the 2006 303(d) list for Region 5) and make significant progress in completing them before initiating Phase 2.**
- **Recognize the State’s responsibility in the TMDL for the greatest proportion of the methylmercury load to the Delta (open water and tributaries). Allocate load reductions to the State and require characterization and control studies by the State if those are pursued.**

R-378: Based on input from stakeholders before and after the April 2008 hearing meeting, several key changes were made to the draft BPA that address the above comments. First, new text was added to the draft BPA that specifies dates during Phase 1 by which the Central Valley Water Board commits to developing mercury control programs for the major tributary inputs to the Delta (American, Cosumnes, Feather, Mokelumne Sacramento, and San Joaquin Rivers, and Marsh, Morrison and Putah Creeks).

R-379: In addition, to better recognize that methylmercury is an environmental legacy of state and federal concern, the TMDL allocation strategy was adjusted since the April 2008 hearing meeting to incorporate the same percent reductions required for open-water habitat in all Delta/Yolo Bypass subareas as are required for other point and nonpoint sources that discharge to those subareas (rather than setting open water allocations equal to existing average annual methylmercury loads, as was done in the February 2008 draft report). In addition, the February 2010 draft Basin Plan amendments now include language that explicitly requires state and federal agencies whose projects affect the transport of mercury and the production and transport of methylmercury through the Yolo Bypass and Delta or manage open

water areas in the Yolo Bypass and Delta (including but not limited to the Department of Water Resources, State Lands Commission, Central Valley Flood Protection Board, U.S. Army Corps of Engineers, and U.S. Bureau of Reclamation) to conduct Phase 1 methylmercury control studies and implement methylmercury reductions as necessary to comply with the open-water allocations by 2030.

R-380: Both the February 2008 and February 2010 versions of the draft BPA included methylmercury allocations for the tributary inputs to the Delta/Yolo Bypass and required a reduction of 110 kg/yr of total mercury from the tributary watersheds. The TMDL control programs developed for the upstream watersheds would define allocations and reduction requirements for specific methylmercury and total mercury sources (which include legacy sources) within the tributary watersheds.

2. The proposed controls for methylmercury will not reduce mercury concentrations in fish tissue; consider Minnesota approach

Methylmercury is different than other impairments addressed by the Regional Board. The concentrations and effects of mercury in our water bodies today are not caused by current land uses. Scientists widely recognize that mercury is a naturally-occurring element and a legacy pollutant, present in Central Valley water bodies predominately as a result of historic mining and natural erosion.

R-381: To clarify, current land uses (e.g., urbanization and irrigated agriculture) and water and flood management practices do affect methylmercury inputs to the Delta. Please refer to Chapters 3, 6 and 7 in the TMDL Report for a detailed description of how modern activities affect methylmercury in the Delta.

R-382: In addition, legacy mercury may comprise only about 30% of inorganic mercury entering the Delta ["Staff's Initial Responses to Board and Stakeholder Questions and Comments at the April 2008 Hearing"⁶⁴ (see item A-1, pages 3 through 12)]. As a result, even if legacy mercury loads could be reduced to zero, we would still need to be concerned about activities in and around the Delta that contribute methylmercury.

The current draft follows a rote TMDL model of blanketing load reductions to every permitted discharger throughout the Delta region without addressing this existing impairment or evaluating the impacts of this approach on discharger operations. This rote approach is followed even while no total mercury or methylmercury control program has documented reductions of mercury in fish to the levels proposed in this TMDL. This TMDL, if adopted in its current form, would have profound impacts on a variety of state and federal mandates and objectives aimed at improving environmental and public health associated with wetland management and restoration within the Delta and its watersheds.

R-383: The above comments mirrors several comments made by SRCSD and CVCWA. Board staff provided detailed responses to the comment regarding "blanketing load reductions" that explain the rationale behind the proposed allocation approach in responses to SRCSD's 24 April 2008 letter. Please refer to Board staff responses R-348 through R-350, which respond to SRCSD's comments within the "Appendix A. TMDL Staff Report" portion of the attachment to their 24 April 2008 letter, provided earlier in this document.

⁶⁴ Available at: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/stakeholder_meetings/25nov08_hearing_rtc.pdf

R-384: Also, as noted earlier, new text was added to the draft BPA that specifies dates during Phase 1 by which the Central Valley Water Board commits to developing mercury control programs for the major tributary inputs to the Delta (American, Cosumnes, Feather, Mokelumne Sacramento, and San Joaquin Rivers, and Marsh, Morrison and Putah Creeks). In addition, both the February 2008 and February 2010 versions of the draft BPA included methylmercury allocations for the tributary inputs to the Delta/Yolo Bypass and required a reduction of 110 kg/yr of total mercury from the tributary watersheds.

R-385: One of the goals of the proposed Phase 1 methylmercury control studies is to identify and evaluate the potential impacts of implementing methylmercury control measures on municipal discharger operations and state and federal mandates and objectives aimed at improving environmental and public health associated with wetland management and restoration within the Delta and its watersheds. The draft BPA was revised based on input from the formal stakeholder process after the April 2008 hearing meeting to incorporate more explicit language for the Phase 1 Program Review that requires the Board to assess potential impacts on discharger operations, wetland restoration, and other Delta and watershed activities based on the results of the Phase 1 studies and other information that becomes available during Phase 1. The February 2010 draft BPA contains the following text:

“The Regional Water Board shall assess: (a) the effectiveness, costs, potential environmental effects, and technical and economic feasibility of potential methylmercury control methods; (b) whether implementation of some control methods would have negative impacts on other project or activity benefits; (c) methods that can be employed to minimize or avoid potentially significant negative impacts to project or activity benefits that may result from control methods; (d) implementation plans and schedules proposed by the dischargers; and (e) whether methylmercury allocations can be attained.”

R-386: Finally, it is not Board staff’s intent to pit environmental objectives against one another. However, the federal Clean Water Act requires that States list water bodies that do not meet water quality standards (i.e., are impaired) and develop programs to correct the impairment. Federal law does not give the State of California license to allow the methylmercury impairment to remain or worsen in trade for other environmental improvements. Even so, the Central Valley Water Board does have flexibility in deciding how the methylmercury reductions will be achieved. Somehow we must develop coordinated programs that address multiple impairments, protect all beneficial uses (e.g., protect critical wildlife habitat and protect wildlife and humans who consume Delta fish), and achieve environmental objectives (e.g., restore critical wildlife habitat). This is a daunting effort and is the reason staff recommended a phased approach to TMDL implementation in the February 2008 and February 2010 draft BPA and staff reports. This concern can and should be further explored during the stakeholder collaboration process throughout the Phase 1 study period and Phase 1 Program Review.

R-387: The Sacramento Stormwater Quality Partnership wrote, “... no total mercury or methylmercury control program has documented reductions of mercury in fish to the levels proposed in this TMDL”. The proposed Delta TMDL would entail no methylmercury load reduction requirements for sources within the Central and West Delta subareas, 44% reductions for the methylmercury sources to the Sacramento River subarea, and 63%, 64%, 73%, and 78% reductions for the San Joaquin River, Mokelumne River, Marsh Creek, and Yolo Bypass subareas, respectively (see Table 8.1, Scenario B, in the TMDL Report). Table 3.2 in TMDL Report reviews 14 water bodies where substantial fish mercury concentration reductions were observed (30-96%) after initiation of local upstream inorganic mercury source controls. As described in Chapter 3 of the TMDL Report (please refer to Section 3.3 in the TMDL Report for citations), most sites studied to date are industrial facilities that discharge to fresh water and

have operated for relatively short periods. The initial decrease in fish tissue concentration near the source of contamination is often fast with about a 50% decline in the first five to ten years. However, after a rapid initial decrease, concentrations tend to stabilize with little, if any, subsequent decline. The new equilibrium value is usually higher than in adjoining uncontaminated waterways and is also often greater than what is recommended as safe for human consumption. The reasons are unclear but may be because small amounts of mercury are still entering from terrestrial sources or because of difficulties in bringing sediment concentrations down to background levels. If contamination has spread to areas more distant than the immediate facility, then reductions in fish tissue concentrations are much slower. Absent from the literature are reports on remediation of pollution from mercury mining. The magnitude and duration of mercury and gold mining in the Delta source region, coupled with the extensive distribution of contamination, will likely make recovery much slower in the Delta than at industrial sites if the Delta control program were to rely only on inorganic mercury source control actions.

R-388: None-the-less, it is important to note that the proposed Delta methylmercury TMDL implementation approach focuses on controllable methylmercury processes (see Chapter 3 in the draft TMDL Report), which includes reduction of inorganic mercury sources but does not focus on some determination of background levels of inorganic mercury in ambient water or sediment. Focusing on controllable processes is expected to increase the number of methylmercury and inorganic mercury control options at our disposal and enable more rapid improvements.

R-389: The Santa Clara Valley Water District's pilot project to reduce methylmercury in Lake Almaden in the Guadalupe Watershed has shown very positive results.⁶⁵ Levels of methylmercury in the water column of Lake Almaden decreased significantly (e.g., a greater than 96% decrease in unfiltered methylmercury in water in 2006 from 2005 levels) after the Santa Clara Valley Water District installed solar-powered water circulators.

Recent mercury TMDLs in Minnesota¹ (covering two-thirds of the state's listed water) and in seven Northeast states² (covering over 10,000 water bodies and 46,000 river miles) have taken a alternative more prudent approach that would be appropriate for the Delta as well. Those TMDLs recognize that the major (>97%) source of total mercury in the environment is atmospheric deposition. Given the magnitude of the reductions required to implement the TMDLs, the regulators in Minnesota and the Northeast states recognized that they could reduce in-region sources further to compensate for insufficient reductions from out-of-region or otherwise uncontrollable sources. Instead of allocating WLA among and setting concentration limits for individual sources within the state or region, mercury reduction will be accomplished through mercury minimization plans and the continuation of region-wide mercury reduction efforts. Stormwater managers in the Central Valley should not have to do any more than that. The methylmercury characterization and control studies proposed in this TMDL would expend limited public funds with no environmental benefit. [Footnote 1: Minnesota Statewide Mercury Total Maximum Daily Load (2007). By Minnesota Pollution Control Agency. Submitted March 27. Footnote 2: Northeast Regional Mercury Total Maximum Daily Load (2007). By Connecticut Department of Environmental Protection (DEP), Maine DEP, Massachusetts DEP, New Hampshire Department of Environmental Services, New York State Department of Environmental Conservation,

⁶⁵ Drury, D. 2007. Santa Clara Valley Water District. Reduction of methyl mercury concentrations in an urban lake using a solar-powered circulator. Presentation at the 2007 Annual International Symposium of the North American Lake Management Society. October. <http://www.nalms.org/Conferences/Orlando/PDF/Orlando2007Program.pdf>

Rhode Island Department of Environmental Management, Vermont Department of Environmental Conservation, New England Interstate Water Pollution Control Commission. Submitted October 24.]

R-390: The above comment mirrors the comment included in CVCWA's 9 April 2008 letter. Please refer to Board staff's detailed response to this comment where it was first mentioned in CVCWA's letter provided earlier in this document, for example, Board staff responses R-57 through R-67.

We generally support the concept of offset programs as an alternative compliance tool. However, these programs should be pursued as part of the State's effort to address the existing mercury impairment and funded accordingly.

R-391: The February 2010 draft Basin Plan amendments contains language that was updated since the February 2008 version to reflect additional input from SRCSD, CVCWA and other stakeholders during the formal stakeholder process after the April 2008 hearing meeting. The new language provides revised guidance for developing Phase 1 pilot offset projects and a long-term offset program, and a schedule for the development of a long-term offset program. Stakeholders, including Board staff, have committed to developing a more detailed offset credit strategy during Phase 1 of the proposed control program. In addition, the updated BPA would not require implementation of methylmercury controls to achieve the proposed allocations until after the Board has developed control programs for the major tributary inputs, considered the adoption of an offset program, and completed the Phase 1 Program Review.

R-392: As noted earlier, Board staff is supportive of developing a long-term offset program or other regional or watershed approach to complying with allocations. The draft BPA contains a schedule for the development of a long-term offset program. However, the Central Valley Water Board does not specify or mandate the actual means of compliance by which responsible entities [e.g., dischargers, government, nonprofit, and private agencies, or other persons responsible for complying with total mercury and/or methylmercury control requirements] choose to comply with the proposed allocations in the draft Basin Plan amendments or any other permit effluent limits. As a result, any participation in an offset program must be on a voluntary basis, and funded accordingly.

Recommendations:

- **Revise the TMDL to follow the example of prudence set by other states in seeking mercury reductions through mercury minimization plans and the continuation of region-wide mercury reduction efforts.**

R-393: Please refer to Board staff's earlier responses regarding the Minnesota and Northeast state's TMDLs for staff's response to this recommendation.

- **The Regional Board should use an approach that emphasizes holistic, Delta ecosystem-wide benefits when considering elements of the TMDL. The test of feasibility for any methylmercury control measure should consider the potential negative environmental consequences of any proposed changes to our stormwater management program such as the potential of prohibiting wetland construction. This potential negative environmental consequence should be balanced with the negligible measurable benefit of reducing mercury concentrations in discharges to the Delta that represent less than half of 1% of the load.**

R-394: Please refer to Board staff's earlier responses that address this comment, for example, responses R-376 and R-377, and R-383 through R-386.

- **Revise the TMDL to include a Use Attainability Analysis, completed by the Regional Board in Phase 1, to determine if the fish tissue goals are reasonable and achievable. Adjust the fish tissue objective accordingly.**

R-395: A Use Attainability Analysis is not possible until the proposed Phase 1 methylmercury control studies have been completed. The adaptive strategies outlined in both the February 2008 and February 2010 draft BPAs were designed to encompass the need for additional tributary source analyses and methylmercury control studies, and to allow the Delta control program and associated fish tissue objectives, linkage and allocations to be modified as new scientific and management information becomes available. This approach was further developed by the formal stakeholder process after the April 2008 hearing meeting and the February 2010 draft Basin Plan amendments now contain more detailed language describing the adaptive management approach as well as more detailed requirements for the Board to conduct a Phase 1 Program Review. As noted earlier, the draft BPA requires the Board's Phase 1 Program Review to assess the effectiveness, costs, potential environmental effects, and technical and economic feasibility of potential methylmercury control methods identified by the Phase 1 studies and whether the methylmercury allocations can be attained. During the Phase 1 Program Review, the Central Valley Water Board can consider modifying wasteload allocations and/or fish tissue objectives based on the results of the Phase 1 studies and other new scientific and management information.

- **Support rather than discourage and delay State implementation and funding of mercury offsets.**

R-396: This recommendation mirrors CVCWA's 9 April 2008 recommendation #4, "Support Rather than Discourage Mercury Offsets". Please refer to Board staff's detailed responses to this comment where it was first mentioned in CVCWA's letter provided earlier in this document, in particular, Board staff responses R-124 through R-127 and R-130 through R-134.

R-397: As noted earlier, Board staff is supportive of developing a long-term offset program or other regional or watershed approach to complying with allocations. The draft BPA contains a schedule for the development of a long-term offset program. However, the Central Valley Water Board does not specify or mandate the actual means of compliance by which responsible entities [e.g., dischargers, government, nonprofit, and private agencies, or other persons responsible for complying with total mercury and/or methylmercury control requirements] choose to comply with the proposed allocations in the draft Basin Plan amendments or any other permit effluent limits. As a result, any participation in an offset program must be on a voluntary basis, and funded accordingly.

3. MS4 mercury control efforts must focus on total mercury; existing MS4 control efforts are MEP

Although stormwater is a minor contributor of mercury, we recognize the benefit of doing whatever is feasible to reduce our mercury discharges. In that regard, we support requirements to continue our existing programs intended to reduce total mercury discharges to the maximum extent practicable.

R-398: Board staff worked with MS4 representatives during the formal stakeholder process to draft the following text in the February 2010 draft BPA that supports the continuation of existing programs:

“MS4 dischargers listed in Table C shall implement best management practices (BMPs) to control erosion and sediment discharges consistent with their existing permits and orders with the goal of reducing mercury discharges.

The Sacramento MS4 (CAS082597), Contra Costa County MS4 (CAS083313), and Stockton MS4 (CAS083470) permittees shall implement pollution prevention measures and BMPs to minimize total mercury discharges. This requirement shall be implemented through mercury reduction strategies required by their existing permits and orders. Annually, the dischargers shall report on the results of monitoring and a description of implemented pollution prevention measures and their effectiveness.

The Sacramento MS4 (CAS082597), Contra Costa County MS4 (CAS083313), and Stockton MS4 (CAS083470) shall continue to conduct mercury control studies to monitor and evaluate the effectiveness of existing BMPs per existing requirements in permits and orders, and to develop and evaluate additional BMPs as needed to reduce their mercury and methylmercury discharges within and upstream of the legal Delta boundary.”

However, we are unable to directly control methylmercury production and should not be required to focus control efforts on methylmercury.

R-399: It is conceivable that pollution prevention measures and BMPs implemented to minimize total mercury discharges will also control methylmercury adequately to achieve the proposed methylmercury allocations for MS4s. However, additional studies are needed to determine the ability to directly control methylmercury production and loss processes in urban catchments. As noted in Board staff’s responses to CVCWA and SRCSD comments and earlier comments from the Sacramento Stormwater Quality Partnership provided in this document, recent information about other point and nonpoint methylmercury sources shows promise for the development of methylmercury controls. Board staff provided a detailed explanation of the rationale behind the proposed allocation approach in responses to SRCSD’s 24 April 2008 letter. Please refer to Board staff responses R-348 through R-350, which respond to SRCSD’s comments within the “Appendix A. TMDL Staff Report” portion of the attachment to their 24 April 2008 letter, provided earlier in this document.

This point is particularly important in that the effects of methylmercury in our water bodies today are not caused by today’s urban areas or other land and water managers, but the result of historic discharges.

R-400: Please see Board staff’s response to this comment where it was made earlier in the Sacramento Stormwater Quality Partnership’s letter.

The SSQP’s comprehensive draft Mercury Plan, submitted to the Regional Board on May 1, 2004, already guides the Permittees’ mercury reduction activities. Although comments on the draft plan have not been received to date, the Permittees have already implemented key provisions to ensure continued progress in reducing total mercury. The Mercury Plan incorporates the SSQP’s existing BMPs that reduce mercury through sediment control/removal and adds new pollution prevention BMPs to satisfy permit specified concepts. New BMPs promote the proper handling and disposal of mercury-containing products by Permittee employees, the commercial/industrial sector and the general public. The TMDL should recognize this plan as an adequate level of effort by the SSQP in controlling discharges calculated as being less than half of 1% of the load to the Delta.

R-401: Please refer to the before-mentioned revised draft BPA text provided in the earlier Board staff response (R-398), which recognizes the effort entailed by the draft Mercury Plan. It's important to note that, although the February 2010 draft BPA (like the 2008 draft BPA) requires the three largest MS4s in the Delta area (Sacramento, Stockton and Contra Costa MS4s) to conduct Phase 1 methylmercury control studies, it also includes new language developed with stakeholder input that specifies that studies can be developed by a stakeholder group approach or other collaborative mechanism that is not limited to particular source categories, and that characterization information can be used to prioritize the control studies. Also, please refer to Board staff responses R-348 through R-350, where Board staff provided a detailed explanation of the rationale behind the proposed allocation approach and why it may be necessary for relatively small dischargers to make load reductions. The adaptive management approach incorporated in the control program will enable the control program to be modified at the end of Phase 1 based on new information, enabling the best use of limited resources to maximize environmental benefits when methylmercury controls are implemented to achieve allocations during Phase 2. Implementation of methylmercury control actions to achieve the methylmercury allocations would not be required until the Board's Phase 1 Program Review has been completed.

In addition, by focusing TMDL control efforts unnecessarily on insignificant MS4 methylmercury discharges, important MS4 BMPs would be negatively impacted. This TMDL would significantly affect the MS4s ability to utilize wet detention basins and wetlands as BMPs for the reduction of other pollutant discharges. There are few other BMPs available to MS4s that provide the same high level of pollutant removal efficiency as wet basins and as such the MS4s ability to reduce pollutant discharges would be negatively affected by the limits placed on the use of wet basins.

R-402: Studies are needed to demonstrate whether wet detention basins and wetlands used to reduce other pollutants cause increases in methylmercury discharges, and whether implementation of measures to control methylmercury and/or inorganic mercury would result in negative impacts on the use of wet detention basins and wetlands to reduce other pollutants. Also, it may be possible to achieve methylmercury allocations by vigorous and sustained implementation of mercury-specific pollutant reduction programs (e.g., the before-mentioned Mercury Plan), as well as implementation of programs to reduce other pollutants. For example, as discussed in Section 4.3.10.3 in the February 2010 draft BPA Staff Report, it is possible that programs designed to reduce ground-level ozone (e.g., by improvements to mass transit, ride share, and bicycle-to-work programs to reduce vehicle exhaust and by expansion of existing urban tree planting programs, particularly of species that have low emissions of volatile organic compounds, to help reduce ground-level ozone, particulate matter, and other pollutants) could reduce the amount of particulate mercury and reactive gaseous mercury, and subsequent formation of methylmercury, in urban catchments.

R-403: The Santa Clara Valley Water District's pilot project to reduce methylmercury in Lake Almaden in the Guadalupe Watershed has shown very positive results.⁶⁶ Levels of methylmercury in the water column of Lake Almaden decreased significantly (e.g., a greater than 96% decrease in unfiltered methylmercury in water in 2006 from 2005 levels) after the Santa Clara Valley Water District installed solar-powered water circulators. It is conceivable

⁶⁶ Drury, D. 2007. Santa Clara Valley Water District. Reduction of methyl mercury concentrations in an urban lake using a solar-powered circulator. Presentation at the 2007 Annual International Symposium of the North American Lake Management Society. October. <http://www.nalms.org/Conferences/Orlando/PDF/Orlando2007Program.pdf>

that similar technology could be used to help reduce methylmercury discharges from detention basins that are found to be substantial sources of methylmercury discharges from urban catchments.

R-404: As noted in Board staff's responses R-348 through R-350, we do not yet know which sources are "insignificant".

Recommendation:

- **The TMDL should recognize existing MS4 total mercury control efforts as MEP. The TMDL should support the continuation of these efforts in lieu of the ability to control methylmercury production.**
- **The TMDL should not require further characterization and control studies for MS4s nor should it require changes in wet detention basin or wetlands operations until after the existing mercury impairment has been evaluated in Phase 1 of the TMDL and then only if MS4 discharges have been determined to be of greater significance.**

R-405: Please refer to Board staff's earlier responses that address these comments were they first made in the comment letter, e.g., responses R-376, R-385, R-391, and R-398 through R-404.

We appreciate this opportunity to provide early input into the Basin Planning process and look forward to working with you and your staff to resolve our concerns.

R-406: Board staff worked with staff from the City and County of Sacramento and other stakeholders to resolve many of these concerns during the formal stakeholder process after the April 2008 hearing meeting and looks forward to continued collaboration as the Delta mercury control program is implemented.

16. South Delta Water Agency

Letter date: 9 April 2008

From: John Herrick, Counsel and Manager, South Delta Water Agency (SDWA)

The following comments to the methyl mercury ("MeHg") TMDL and proposed Basin Plan Amendment ("draft BPA") are submitted on behalf of the South Delta Water Agency.

SDWA, along with other in-Delta interests have participated in the MeHg TMDL process from the very beginning. At every stage, comments have been given, both orally and written, criticizing the approach to the problem, and how it unfairly focuses on interests who are clearly not part of the problem. Notwithstanding this input, the staff reports and documents proposed for adoption by the Regional Board continue with the unscientific and "backwards" approach to regulating the problem. In brief, the staff proposals begin by imposing significant financial burdens on interests who are responsible for the smallest possible percentage of the problem, treating them the same as others who are a much larger part of the problem and ignoring those who are the greatest part of the problem. This approach defies explanation and should not be condoned, much less adopted by the Regional Board.

R-407: To avoid redundancy, Board staff responds to the above comments after the corresponding detailed comments provided by the South Delta Water Agency (SDWA) in the following paragraphs.

1. The text of the documents does not clearly set forth how total mercury compares to methyl mercury. However, Figure 4.2 of the draft BPA gives us an annual load of total mercury of 402.1 kilograms. It also gives us an annual load of methyl mercury of 5,218 grams. Hence, methyl mercury is approximately 1.2% of the average annual load of total mercury. [The Board will please excuse any error in my calculations. If I have dropped or added a "zero" anywhere it is purely unintentional, and does not detract from the basic fact that the proposed program inexplicably focuses on the smallest potential contributor to the problem.]

R-408: Although methylmercury is only about 1% of all mercury discharged to the Delta, methylmercury is the form that accumulates in the food web and is actually the pollutant of concern in fish tissue. The best available science indicates that reducing methylmercury in ambient water is the most direct way to reduce methylmercury in biota.

According to the draft Basin Plan Amendment (page ES-2), 60% of the MeHg loads come from the tributaries to the Delta, and 40% come from in-Delta sources. Of the 100% of MeHg "flux" from sediments and open water habitats constitutes 31%, wastewater treatment sources 4%, and agricultural runoff about 3%.

Put in context, agricultural runoff from in-Delta sources is 3% of the MeHg load, which is .00036 of the total mercury load. The parties (purportedly) responsible for this minute contribution are required to undertake "characterization and control studies" in order to better understand how they might be making these contributions, and determine how to decrease those contributions. The draft BPA estimates these studies will cost from \$430,000 to \$820,000. It worth noting that the San Joaquin-Delta Water Quality Coalition (under the ILP and which is assumed/suggested as the party to conduct the studies and tests) is currently approximately \$1,000,000 per year.

Clearly, it makes no sense to require certain interests to make this level of expenditure when those interests constitute such a minimal portion of the problem. In-Delta agriculture's (purported) 3% contribution of the problem is not only within the margin of error of the staff's calculations, it is one third of the 10% cushion built into the TMDL.

R-409: Staff recognizes that the cost of control studies is substantial and that agricultural within the Delta may be a relatively small source of methylmercury (e.g., compared to the tributary inputs). To address this concern (in particular, to help reduce the costs of the studies and increase their effectiveness), Board staff worked with stakeholders after the April 2008 hearing meeting to develop BPA text that explicitly states that control studies can be developed by a stakeholder group approach or other collaborative mechanism that is not limited to particular source categories, and that characterization information can be used to prioritize the control studies. Agricultural dischargers on the Delta Islands can make use of the results of a recently completed study by Moss Landing Marine Laboratories (Heim *et al.*, 2009⁶⁷) to further reduce study costs, if the dischargers find the study to adequately characterize their discharges.

R-410: In addition, the first phase of the proposed control program focuses on implementation actions to reduce total mercury. Board staff worked with stakeholders after the April 2008 hearing meeting to develop BPA text that more explicitly defines a Phase 1 Program Review that must take place before implementation of methylmercury controls is required to comply with the proposed methylmercury allocations. Per the revised text in the February 2010 draft BPA, implementation of methylmercury controls to achieve the proposed methylmercury allocations would not be required until the Central Valley Water Board develops TMDL mercury control programs for the major tributaries and completes the Phase 1 Delta Mercury Control Program Review. The February 2010 draft BPA includes the following text:

“By [nine years after Effective Date] at a public hearing, and after a scientific peer review and public review process, the Regional Water Board shall review and reconsider, if appropriate, the Delta Mercury Control Program and may consider modification of objectives, allocations, implementation provisions and schedules, and the Final Compliance Date.

The Regional Water Board shall assess: (a) the effectiveness, costs, potential environmental effects, and technical and economic feasibility of potential methylmercury control methods; (b) whether implementation of some control methods would have negative impacts on other project or activity benefits; (c) methods that can be employed to minimize or avoid potentially significant negative impacts to project or activity benefits that may result from control methods; (d) implementation plans and schedules proposed by the dischargers; and (e) whether methylmercury allocations can be attained.”

R-411: The “10% cushion” is the margin of safety included in the proposed goal for methylmercury in ambient Delta water. The goal for ambient Delta water has several purposes; it is used to link methylmercury in Delta water to methylmercury in fish and it is used to determine how much methylmercury sources need to be reduced to achieve the proposed fish tissue objective. All individual sources (and even several source categories) identified to date are smaller than this margin of safety and could therefore use the same logic as used by

⁶⁷ Heim, W.A., S. Deverel, T. Ingram, W. Piekarski, and M. Stephenson. 2009. Assessment of Methylmercury Contributions from Sacramento-San Joaquin Delta Farmed Islands. Contract 04-235-150-0. August 2009 final report submitted to the Central Valley Regional Water Quality Control Board. Available at: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/other_technical_reports/

SDWA, that they should be excluded from control study and implementation requirements because they are small. However, it is the sum of all these small discharges that creates the impairment. Each source load calculated for the TMDL is based on methylmercury concentration and discharge volume data specific to each source. The methylmercury source analysis described in the TMDL Report indicates that reducing or eliminating any one source (or source category) is unlikely to result in achieving the proposed fish tissue objectives throughout the Delta.

As a result, an allocation strategy that assigns an equal percent reduction to point and nonpoint source discharges within the Delta/Yolo Bypass and tributary inputs is the most equitable distribution of responsibility. A decision to establish allocations that incorporate reductions for some sources while allowing others to stay the same or increase would be based solely on a subjective evaluation of which dischargers are more valuable to the citizens of California, an evaluation that Board staff cannot technically make. In addition, without the completion of additional methylmercury control studies, and characterization of point and nonpoint sources in the tributary watersheds, it is very difficult to determine which sources are the most feasible and cost-effective to control. A phased approach that focuses on control studies and total mercury reduction activities during the first phase of the control program is a reasonable approach, given the federal requirements for TMDLs, the high number of small individual sources, and the sheer magnitude of the river flows through the Delta.

For example, the Sacramento River is the largest river in California and drains a 27,000 square-mile area – almost one fifth of the State of California and about one half of the Central Valley. It is not surprising that two of the largest individual methylmercury inputs to the Delta identified in the TMDL Report (Cache Creek Settling Basin [137 g/yr] and SRCSD Sacramento River WWTP [161 g/yr]; see Tables 6.2 and 6.5 in the February 2010 TMDL Report) are each only about 7% and 8%, respectively, of the Sacramento River's input to the Delta at Freeport (2,026 g/yr during the relatively dry WY2000-2003 TMDL period). However, as noted as early as 1997 in the Sacramento River Mercury Control Planning Project report prepared for SRCSD by Larry Walker Associates, "... mercury sources in the study area appear to be diffusely distributed without any significant "hotspots" ..." (LWA, 1997,⁶⁸ page 31). This is expected to be true for both methylmercury and inorganic mercury sources in the Sacramento River watershed and other watersheds that drain to the Delta.

R-412: When discussing the importance of different sources, many stakeholders have focused on the amount of loading by source category and by individual discharge. However, staff recommends that additional factors be considered. Given how many individual discharges there are in each source category in the Delta, almost all of the individual discharges are small. And, although the tributary inputs are substantial, available information indicates that they also contain a similar distribution of individual discharges. It is the sum of all of the individual discharges in the Delta and its tributary watersheds that impairs the Delta. Each of the individual discharges has its own intrinsic value and financial constraints. As a result, the significance of different methylmercury and total mercury sources could be defined by: (a) their load, (b) their distance from an impaired area, (c) how big of a reduction is needed to achieve safe fish mercury levels in a given impaired area, (d) whether they can be controlled, (e) whether they can be controlled without impacting habitat function, (f) the cost to control them, and (g) the resources available to the responsible parties to implement controls. It is

⁶⁸ LWA. 1997. Sacramento River Mercury Control Planning Project. Final project report prepared for the Sacramento Regional County Sanitation District by Larry Walker Associates (LWA). March.

conceivable that the control program will need to focus on just a few large projects in some watersheds, but many small projects in other watersheds, to achieve safe fish mercury levels throughout the Delta.

R-413: It was not staff's intent to imply that focusing only on in-Delta sources, or only on agricultural sources in the Delta, would resolve the Delta mercury impairment. To address SDWA and other stakeholder concerns, staff and stakeholders developed draft BPA language that would not require implementation of methylmercury management practices identified in Phase 1 for the purposes of achieving methylmercury allocations until the Regional Water Board has completed the Phase 1 Delta Mercury Control Program Review and has developed mercury control programs for the major tributary inputs.

R-414: As noted earlier, staff recognizes that the cost of control studies is substantial and identified this concern in the Section 7.4 (Economic Factors) in the California Environmental Quality Act (CEQA) evaluation in Chapter 7 of the February 2010 draft BPA Staff Report. Staff recognizes that additional funds will be needed to conduct the Phase 1 control studies, beyond the funds needed for the San Joaquin-Delta Water Quality Coalition. A variety of different funding sources was identified in Chapter 7 that could contribute towards study, monitoring and implementation costs:

- Developing a project for consideration as a Supplemental Environmental Project;
- State or federal grants or low-interest loan programs;
- Single-purpose appropriations from federal or State legislative bodies;
- Bonded indebtedness or loans from governmental institutions;
- Surcharge on water deliveries to lands contributing to a methylmercury or total mercury discharge;
- Ad Valorem tax on lands contributing to a methylmercury or total mercury discharge;
- Taxes and fees levied by a water district created for the purpose of drainage management; and
- U.S.D.A. Agricultural Stabilization and Conservation Service.

2. Although it is not clear from the documents, it appears that the failure of any in-Delta diverter/discharger to financially participate in the required studies and tests would subject him/her to potential penalties for violating a water quality standard. If this is true, it should be clearly stated somewhere in the documents.

R-415: The methylmercury allocations for irrigated agriculture are assigned on a subarea, not individual discharger basis. Staff will first be working with dischargers in collaboration with others, likely through the Irrigated Agriculture Regulatory Program coalitions, before there is any need to resort to penalties for individual dischargers. The February 2010 draft BPA includes the following language to address this comment and other stakeholder input during the formal stakeholder process after the April 2008 hearing meeting:

"If dischargers do not comply with Control Study implementation schedules, the Executive Officer shall consider issuing individual waste discharge requirements or requests for technical reports and management plans."

3. The proposed implementation plan for the TMDL requires irrigated lands within the Delta, where the proposed fish tissue objectives are exceeded, to undertake characterization and control studies. The subarea designated “Central Delta” is assigned no MeHg allocation because there is apparently a net retention (or reduction) of MeHg in that area. The “San Joaquin River” subarea is assigned to reduce 75% of its MeHg load.

R-416: To clarify, point and nonpoint sources in the Central Delta and West Delta subareas are assigned methylmercury load and waste load allocations, respectively, in compliance with federal requirements for TMDLs. The proposed allocations for sources in the Central Delta and West Delta do not incorporate any reductions from existing levels because the fish and water methylmercury levels achieve or almost achieve the proposed fish tissue objects and water column goal, and because methylmercury levels are expected to further decrease in these subareas as control actions take place upstream.

Notwithstanding these allocations, the documents note that the Delta has many islands with peat soils which are believed to facilitate methylization. However, the Central Delta has the largest percentage of the peat soils while the South Delta (included in the San Joaquin River subarea) has very little peat soil. This is counter-intuitive to the allocations.

R-417: Concentrations of methylmercury in fish and water are lower in the Central Delta, relative to the Delta periphery and in tributaries. This regional pattern has remained consistent over time (e.g., Davis *et al.*, 2003 and 2008; Foe, 2003; Slotton *et al.*, 2007; Stephenson *et al.*, 2008⁶⁹). Staff agrees that it is counter-intuitive – when only soil conditions are considered – that the area of the Delta with the largest percentage of peat soils has the lowest concentrations of in the Central Delta. However, there are multiple factors that affect methylmercury concentrations in water and fish in Delta waterways. Net water column methylmercury concentrations (resulting from the combination of source inputs and loss processes) in Central Delta waterways are dominated by methylmercury removal from the water column. The removal of methylmercury from the water column is due to a combination of processes, primarily breakdown of methylmercury by light (photodegradation) and attachment to particles and

⁶⁹ Davis, J.A, B.K. Greenfield, G. Ichikawa and M. Stephenson. 2003. Mercury in Sport Fish from the Delta Region. Final report submitted to the CALFED Bay-Delta Program for the project: An Assessment of the Ecological and Human Health Impacts of Mercury in the Bay-Delta Watershed (Task 2A). San Francisco Estuary Institute and Moss Landing Marine Laboratories. Available at: <http://loer.tamug.tamu.edu/calfed/FinalReports.htm>.

Davis, J.A., B.K. Greenfield, G. Ichikawa, and M. Stephenson. 2008. Mercury in sport fish from the Sacramento San Joaquin Delta region, California, USA. *Science of the Total Environment*, 391:66-75.

Foe, C.G. 2003. Mercury Mass Balance for the Freshwater Sacramento-San Joaquin Bay-Delta Estuary. Final report submitted to the CALFED Bay-Delta Program for the project: An Assessment of the Ecological and Human Health Impacts of Mercury in the Bay-Delta Watershed (Task 1A). California Regional Water Quality Control Board, Central Valley Region. Sacramento, CA. Available at: <http://mercury.mlml.calstate.edu/reports/2003-reports/>

Slotton, D.G., S.M. Ayers, and R.D. Weyland. 2007. CBDA Biosentinel Mercury Monitoring Program, Second Year Draft Data Report Covering Sampling Conducted February through December 2006. May 29, 2007. Available at: <http://www.sfei.org/cmr/fishmercury/DocumentsPage.htm>

Stephenson, M., C. Foe, G.A. Gill, and K.H. Coale. 2008. Transport, Cycling, and Fate of Mercury and Methylmercury in the San Francisco Delta and Tributaries: An Integrated Mass Balance Assessment Approach. CALFED Mercury Project Final Report. Available at: <http://mercury.mlml.calstate.edu/reports/reports/>

settling (Stephenson et al., 2008). Breakdown of methylmercury by bacteria, and uptake into biota also likely contribute to methylmercury loss in the Delta.

In addition, the cross Delta flow induced by the export projects draws water through the Central Delta to the South Delta, while the San Joaquin River flow entering the South Delta (during most months in most years) never leaves the southern Delta; it all goes to exports and local diversions.

R-418: Staff recognized in the draft staff reports that the aqueous concentration of methylmercury at any site or time is the result of the interaction of multiple factors, including methylmercury production and degradation. The South Delta is included in the San Joaquin River subarea, which is defined by the legal Delta boundary to the east and south, and Grantline Canal and the beginning of the Stockton Deep Water Channel to the north. At present, the San Joaquin River is almost entirely diverted out of the Delta by way of Old River and Grantline Canal for export south of the Delta via the state and federal pumping facilities near Tracy. The proposed Basin Plan amendment divides the Delta into subareas based on the hydrologic characteristics and mixing of source waters. By using existing methylmercury concentrations and water movement patterns when determining methylmercury allocations for the eight Delta subareas, staff has taken into account the different factors affecting methylmercury. A network of methylmercury measurements on the major tributaries as they entered the Delta and at locations within the Delta show how average methylmercury concentrations change as water moves across the system. The allocations for methylmercury sources in each subarea are based on conditions observed in each subarea from actual in-stream measurements and so incorporate non-conservative changes in methylmercury concentrations. Available data indicate that reducing loads of methylmercury to any subarea will result in lower concentrations of methylmercury in water and biota in that area.

R-419: For example, in its Localized Mercury Bioaccumulation Study,⁷⁰ SRCSD concluded that SRCSD WWTP effluent contributes about the same percentage of methylmercury to Sacramento River biota downstream of its discharge as it does to the methylmercury loading in the river. SRCSD found that four out of six fish and clams species sampled had methylmercury concentrations about 10% greater downstream from the discharge than upstream. The ratio of SRCSD WWTP methylmercury loads to river methylmercury loads was also about 10% during the study period. There is no information that suggests that methylmercury discharged into a water body would disappear so rapidly that none of it would be accumulated, at least in part, into the food chain immediately downstream of the discharge.

R-420: Mercury is a regional problem because fish methylmercury levels throughout the Delta, the Yolo Bypass, and many of the tributary waterways are higher than is considered safe for human and wildlife consumption. This is because inorganic mercury and methylmercury sources are present throughout much of the region. However, fixing the problem will take local, waterway-specific solutions because each waterway has its own unique set of methylmercury and inorganic mercury sources. As noted earlier, staff developed a separate methylmercury allocation scheme for each hydrologic subarea of the Delta because the levels of impairment within, and the methylmercury sources that discharge to, each subarea are different.

⁷⁰ SRCSD. 2008. Localized Mercury Bioaccumulation Study. Final report prepared for Sacramento Regional County Sanitation District (SRCSD) by Larry Walker Associates in association with Applied Marine Sciences, Studio Geochimica, and University of California, Davis. March 2008.

Hence the staff approach appears to be based on a misunderstanding of Delta hydraulics while at the same time attempting regulation not based on any known causation.

R-421: Please see Board staff's earlier responses that address Delta hydraulics and processes that effect methylmercury concentrations in Delta water and fish.

Does any Central Delta discharger contribute to the amount of MeHg load in the South Delta?

R-422: As noted earlier, the proposed Basin Plan amendment divides the Delta into subareas based on the hydrologic characteristics and mixing of source waters. These subarea delineations are based on information at the time the TMDL was developed and reflect typical conditions. It is conceivable that under some hydrologic conditions that a Central Delta discharger could contribute methylmercury load to the South Delta. However, flows from the Central Delta typically have very low methylmercury concentrations and would act as dilution; if the South Delta were dominated by flows from the Central Delta, we would expect to see lower water and fish methylmercury concentrations in the South Delta.

R-423: The results of a recent particle transport modeling effort (Stephenson *et al.*, 2008b⁷¹) could lead to changes in how the Delta subareas are delineated. For example, during a model run for August 2005 (Stephenson, 2009, video provided through pers. comm.), the particle tracking model indicates the San Joaquin River subarea (which includes the South Delta) could be re-delineated to include more of the Central Delta subarea because the influence of South Delta water could extend farther into the Central Delta than delineated by the TMDL subareas. If funding can be acquired, staff hopes to work with the particle transport model study authors to evaluate a variety of typical hydrographic periods and, if needed, re-delineate the Delta subareas to better reflect the water and sediment sources that drive water and fish methylmercury concentrations in different Delta areas. For more discussion on this topic, please refer to Section 3.5 in Chapter 3 of the February 2010 draft TMDL Report.

Does the South Delta bear any responsibility to decrease loads to the Bay when none of the South Delta water reaches the Bay?

R-424: Water from the South Delta reaches the San Francisco Bay during some hydrologic conditions (e.g., when the federal Central Valley Project and State Water Project pumps in the southern Delta are not in operation). Nonetheless, the load reductions incorporated in the proposed methylmercury allocations are based on conditions specific to each Delta subarea in order to achieve the proposed fish tissue objectives in each Delta subarea, not the amount of reduction needed to achieve the fish tissue objectives specific to San Francisco Bay.

R-425: The San Francisco Bay TMDL assigns a load reduction of 110 kg per year from the Central Valley. As described in Chapter 8 of the draft TMDL Report, the mercury control program for the Delta is designed to achieve the total mercury load reduction required by the

⁷¹ Stephenson, M., A. Bonnema, A. Byington, W. Heim, and K. Coale. 2008b. Delta Transects and Cross Channel Studies: Estimating MMHg Loss in the Delta using the RMA Particle Tracking Model. Final Report submitted to the CALFED Bay-Delta Program for the project "Transport, Cycling and Fate of Mercury and Methylmercury in the San Francisco Delta and Tributaries" Task 5.2. California Department of Fish and Game Moss Landing Marine Laboratories. Available at: <http://mercury.mlml.calstate.edu/reports/reports/>

San Francisco Water Board. Staff recommends that efforts to achieve the 110 kg per year reduction in total mercury loading focus on the tributary watersheds that contribute the most mercury-contaminated sediment to the Delta and Bay (e.g., Cache Creek, Feather River, American River, Putah Creek, and Cosumnes River). Staff expects that greater total mercury load reductions throughout these and other tributary watersheds, along with methylmercury management efforts in the Delta and tributary watersheds, will be needed to achieve the proposed fish tissue methylmercury objectives in every area of the Delta/Yolo Bypass.

4. Staff recommends that parties responsible for 3% of the MeHg load incur approximately the same financial obligations as those responsible for 31%. At the same time, the upstream 60% contributors are not required to undertake any such studies and financial obligations. This further highlights the backwards approach suggest by staff. The logical approach is to start upstream and work your way down. As in dealing with invasive species of plants and animals, one first addresses the upper most source. If one starts at the bottom of the system, the upstream areas continue to “seed” the areas downstream, making efforts to clear out those downstream areas a waste of time and resources.

The same is true with mercury. Because the Bay Regional Board got it backwards, staff believes it must now continue the mistake. In order to limit the Delta’s contribution to the Bay, the Delta is now charged with decreases while the upstream sources (the major contributors) continue to re-seed the Delta with HG and MeHG. The effect is that in-Delta interests who at most are contributing .03 of the MeHG load and .0036 of the total Hg load are now required to both figure out how to solve (someone else’s problem) and reduce their insignificant contribution.

R-426: Although most inorganic mercury in the Delta is, indeed, coming from upstream of the Delta, methylmercury produced within the Delta contributes substantially to concentrations in Delta fish. Staff has detailed the reasons for addressing methylmercury as well as inorganic mercury in Item 1 in “Staff’s Initial Responses to Board and Stakeholder Comments at the April 2008 Hearing”.⁷² Within-Delta dischargers are being asked to address only their contribution to methylmercury loads in the Delta through studies and, in Phase 2, implementation of actions to reduce their methylmercury discharges.

R-427: Staff listened carefully to concerns that upstream loads were not adequately addressed in the February 2008 Basin Plan amendments. In response, the February 2010 Basin Plan amendments contain a time schedule for the Regional Board to complete major upstream TMDLs by 2017, which is before dischargers would have to start implementing control actions to comply with methylmercury allocations. Also, staff assigned requirements for Phase 1 control studies for methylmercury in open water to state and federal agencies with jurisdiction over water management and underlying sediment. The aerial scope of the studies is actually broader for these State and federal agencies than just within the Delta, including upstream tributaries and reservoirs. The proposed Basin Plan amendments require that these agencies evaluate methylmercury control measures for any projects that affect methylmercury and/or inorganic mercury in the Delta (e.g., new upstream water storage facilities that could increase the methylmercury load entering the Delta).

5. Oddly, and clearly contrary to law, staff recommends that new sources of MeHg be allowed discharged into Delta waterways currently designated as “impaired.” The only “burden” placed on the new discharges is that they too cooperate in the studies. This

⁷² Available at: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/stakeholder_meetings/25nov08_hearing_rtc.pdf

means that someone can increase the load of MeHg into the channels at the same time other in-Delta diverters/dischargers are required to spend money to find out how much MeHg is coming off their land, and how they can decrease that amount.

It appears that this preferential and illegal treatment of new contributors is some sort of recognition that increased wetlands (an identified major source of MeHg) also provide a benefit to the Delta and the beneficial uses thereof. However, staff makes no such recommendation for dredging, or other beneficial activities. To the contrary, dredging, which is needed to protect hundreds of thousands of lives and billions of dollars of property (by maintaining flood conveyance capacity), cannot result in any net increase in MeHg.

R-428: After discussion with dredgers and other stakeholders, staff changed the requirements for dredging and dredge material reuse activities from “no net increase” in methylmercury to “minimize increases” in methylmercury discharges from activities conducted in Phase 1. This change made the Phase 1 requirements for dredging activities consistent with those for all other new projects in Phase 1: new and current activities are allowed to discharge methylmercury during the Phase 1 study period. The proposed Basin Plan amendments state that dischargers should implement reasonable and feasible methylmercury practices in Phase 1 as they are identified. All methylmercury dischargers, including “new” projects that start discharging during Phase 1, must begin implementing control actions to comply with the methylmercury allocations during Phase 2. Staff has not given preferential treatment to wetland restoration projects. (Please see Board Staff’s responses to requests from the Delta Protection Commission for exemption for ecosystem restoration projects.)

6. The characterization and control studies require in-Delta interests to measure total and methyl mercury concentrations and loads in “source waters” and “receiving waters.” This means that in-Delta agriculture must pay for the studies to determine how much mercury others have placed in the channels, while those (upstream) others are subject to no testing requirements.

R-429: Following discussions with stakeholders, staff reduced the proposed Phase 1 study requirements by eliminating the source characterization portion. The emphasis is now on developing control methods. Testing control practices will likely involve collection of some methylmercury samples, but monitoring methylmercury and inorganic (total) mercury to calculate loads is no longer required. During the Phase 1 study period, Regional Water Board Staff and the Technical Advisory Committee will be available to help Delta agricultural stakeholders identify efficient and effective studies that collect necessary information without duplicating efforts. Data are available for concentrations of methylmercury in ambient Delta waters and for methylmercury loads from rice and some other types of farmed lands on Delta Islands. Agricultural dischargers on the Delta Islands can make use of the results of a recently completed study by Moss Landing Marine Laboratories (Heim *et al.*, 2009⁷³) to reduce study costs.

⁷³ Heim, W.A., S. Deverel, T. Ingram, W. Piekarski, and M. Stephenson. 2009. Assessment of Methylmercury Contributions from Sacramento-San Joaquin Delta Farmed Islands. Contract 04-235-150-0. August 2009 final report submitted to the Central Valley Regional Water Quality Control Board. Available at: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/other_technical_reports/

R-430: At an early point in development of the Delta mercury control program, staff proposed that all methylmercury dischargers within a 30-mile radius of the legal Delta boundary participate in the Phase 1 studies. This would have increased the amount of methylmercury control information produced. Although staff has not completed detailed methylmercury source analyses for Delta tributary watersheds, source types and control options are expected to be similar for sources upstream of and within the Delta. However, stakeholders at that time commented that allocations and associated study requirements should apply only to sources within and entering the legal Delta and Yolo Bypass.⁷⁴ Instead of requiring that upstream dischargers (except water management agencies) participate in studies, the February 2010 Basin Plan amendments provide for voluntary, early participation in studies. Dischargers who participate in the Delta Phase 1 control studies would be exempt from conducting equivalent control studies under future, upstream control programs. The February 2010 BPA also includes requirements for the Regional Water Board to develop TMDLs for the major upstream tributaries by specific dates during Phase 1.

7. The draft BPA requires that water management, conveyance and flood flow management parties must also conduct the characterization and control studies. However, the document does not fully discuss the possible conflicts and effects which may result. If a flood conveyance project or action increases flows at certain times, that may be a benefit to many things, but may affect the flux from sediment. Does there not need to be an analysis of the conflicting benefits and tradeoffs before deciding that an action might cause a violation of the newly proposed Basin Plan?

Similarly the documents discuss how water management and releases for salinity control might affect methylization. Again, this raises serious issues wholly ignored by the draft BPA. Numerous in-Delta beneficial uses require salinity standards and benefit from increased net channel flows (the current and probable method for achieving these objectives). However, the draft BPA seems to suggest that changes to meet these preexisting objectives might increase MeHg and thus be a violation of the new Basin Plan. Much more analysis is required before the Regional Board adopts something that might work against meeting other water quality objectives. [It should be noted that the Regional Board has still not adopted an upstream salinity objective on the San Joaquin after having been directed to do so by the SWRCB for many years.]

R-431: Staff agrees that it is important to identify, evaluate and resolve potential conflicts with activities that implement other legal mandates and public benefits. The Central Valley Water Board will adaptively manage the Delta mercury control program. The proposed Basin Plan amendment commits the Regional Board to reviewing feasibility and potential impact of methylmercury controls before methylmercury control actions are required. As noted earlier, Board Staff worked with stakeholders after the April 2008 hearing meeting to develop BPA text that more explicitly defines a Phase 1 Program Review that must take place before implementation of methylmercury controls is required to comply with the proposed methylmercury allocations. The February 2010 draft BPA includes text that commits the Board to assessing during the Program Review: (a) the effectiveness, costs, potential environmental effects, and technical and economic feasibility of potential methylmercury control methods; (b) whether implementation of some control methods would have negative impacts on other project or activity benefits; (c) methods that can be employed to minimize or avoid potentially

⁷⁴ *Basin Plan Amendment Revisions Based on Stakeholder Comments Since June 2006.*
http://www.waterboards.ca.gov/centralvalley/board_decisions/tentative_orders/0804/delta_mercury/delta_mercury_att_2.pdf

significant negative impacts to project or activity benefits that may result from control methods; (d) implementation plans and schedules proposed by the dischargers; and (e) whether methylmercury allocations can be attained. As part of the Program Review, the Board may consider modification of objectives, allocations, implementation provisions and schedules, and the Final Compliance Date, based on the results of the Phase 1 studies and other information that becomes available during Phase 1.

R-432: The Regional Board does not yet have enough information to make the decision that, for a particular methylmercury source, methylmercury controls are infeasible, or other public benefits compel an exemption from methylmercury reduction requirements. During Phase 1, staff will work with stakeholders to determine potential negative consequences of specific requirements on specific projects and processes. Assistance is needed, though, from stakeholders involved in other activities and planning processes to help identify the potential conflicts and feasible solutions.

8. The draft BPA makes no real analysis of what various parties might do to decrease methylization or total loading of Hg. The documents simply anticipate that the various parties, in the Delta (but not upstream contributors) will spend enough money and develop the methods by which the TMDL will be accomplished. What this suggests to the public is that the Regional Board has no real idea of how to address the problem, but will instead defer any real decision, order others (some clearly not any meaningful cause of the problem) to look into it and then reconsider the issue at a later date.

The only real suggestion (with regard to agricultural) is that in-Delta farmers might institute “tailwater recovery systems” to reduce their runoff. Such suggestions indicate a significant lack of understanding. Southern Delta agriculture encompasses nearly 70 soil types. Many of these do not allow for the leaching of salts without sufficient time and additional applied water. Because the CVP service area in the San Joaquin valley contributes huge salt loads at high concentrations, southern Delta farmers must apply certain amounts of water and then have sufficient time for the applied water to leach out the CVP introduced salts. Decreasing the applied water, and thus decreasing the amount of discharge/runoff would be counter productive and harmful to crops. The issue is even more complicated in the Central Delta where the lands are below sea level and subject to constant seepage.

R-433: Staff revised the staff reports to provide more information about factors known to control methylmercury production and degradation and reasonably foreseeable methods of compliance with methylmercury reduction requirements. For more information, please see the TMDL Staff Report Chapter 3 and Basin Plan Amendment staff report Chapter 4.3 implementation alternatives, Chapter 7 environmental evaluation, and Appendix C cost estimates. Staff also used information in this comment and later comments provided by SDWA during the formal stakeholder process to revise the discussion of potential use of tailwater recovery (Basin Plan Staff Report sections 4.3.10 (in Chapter 4) and 7 II.A (in Chapter 7)), particularly for the South Delta. It is helpful that since the April 2008 hearing, more research has been conducted on characterizing methylmercury inputs, and ways to limit methylmercury discharge, from irrigated agriculture and wetlands. As part of the Delta TMDL stakeholder collaborative process, the Nonpoint Source Workgroup hosted a meeting in November 2009 during which scientists and land managers described recent research and suggested management practices that could be evaluated for various source types as well as possible concerns.

R-434: Note, because fish mercury levels in the Central Delta and West Delta subareas approach or achieve the proposed fish tissue objectives, methylmercury dischargers within these subareas are not required by the draft BPA to reduce their methylmercury discharges.

It is clear that the staff based its calculations on a misunderstanding of the facts and its estimates of studies and potential actions are probably unsupportable.

A reasoned analysis of the problem leads to the conclusion that in order to address the mercury problem in the Central Valley, one would first start in the upstream reaches, identify the sources of mercury and suggest how to decrease or eliminate them. Next, one would identify where and how upstream methylation occurs and suggest how to decrease or eliminate them. Finally, after getting control of the sources of mercury and the upstream activities which methylize it, one would then examine how the Delta itself may contribute to Hg and MeHg and determine what might be done in that area. Of course, any "cause" which constitutes .03 or .0036 of the problem would be at most, deferred until the major causes are addressed. Certainly, one would not begin to regulate the smallest part of the problem first, and would not place a significant financial burden on those smallest contributors.

Inexplicably, staff has adopted an approach that can only be described as backwards, and which treats the parties least responsible as if they were the most responsible. All the while, the contributors of 60% of the MeHg go unregulated, and do not participate in the studies. The proposed BPA and accompanying TMDL must be fundamentally changed and can not be adopted in their present form.

Please call me if you have any questions or comments.

R-435: In response to these and similar comments from other stakeholders, staff revised the draft Basin Plan amendments to include a timeline for developing upstream TMDLs within Phase 1. Within-Delta sources contribute substantially to the excessive levels of methylmercury in fish. The within-Delta sources must be addressed as well as the upstream sources. The load and wasteload allocations included in the draft Basin Plan amendments assign an equitable distribution of responsibility between point and nonpoint sources within the Delta and inputs from the Delta's tributary watersheds. Please see staff's more detailed responses to SDWA comments earlier in this document that address the above concerns.

17. Southeast Asian Assistance Center

Letter date: 18 April 2008

From: *Laura Leonelli, Executive Director, Southeast Asian Assistance Center (SAAC), Sacramento, CA*

Southeast Asian Assistance Center (SAAC) would like to submit these comments on the proposed Delta Methylmercury TMDL, released in February 2008. For the past 2 years, SAAC, in collaboration with UC Davis, has been conducting outreach and information to subsistence fishers in our communities of service: newcomers from Southeast Asia and the former Soviet Union, now residing in the Sacramento area. We have also conducted surveys about fish consumption, both frequency and preferred varieties. From this data, UC Davis has been able to track patterns of fish consumption that demonstrate a much higher level of consumption than just one meal per week. Some people fish every day. Fish is a high value food in many cultures, and low income people need to supplement their diets by fishing, especially now that food prices are rising. We are concerned that the strategy being considered is mainly based on consumers monitoring their own fishing behavior, rather than providing a cleaner environment where the public will be able to fish safely.

R-436: The intent of the exposure reduction program is to protect people eating Delta fish in the short term, while methylmercury and mercury sources are being reduced. The draft Basin Plan amendment text that describes the Exposure Reduction Program now contains the following statement: "The Exposure Reduction Program is not intended to replace timely reduction of mercury and methylmercury in Delta waters."

At the community meetings, people express support for actual source cleanup and remediation measures, some of which are recommended in the TMDL report. However, given that people are, and have been, consuming fish in significant amounts, we are concerned that the report does not require reductions before another 8-year study period. Studies have already been conducted and the health effects of mercury are documented. We support an adaptive management approach that would combine reduction actions with further study, and public reporting of these actions and their results.

R-437: Staff agrees that actual improvements in the mercury impairment should not be delayed in the TMDL program. The draft Basin Plan Amendments do name mercury control actions that are to be completed during Phase 1, simultaneously with the methylmercury characterization and control studies. Staff's proposed early implementation actions are:

- NPDES-permitted facilities must implement mercury minimization programs and report results to the Board annually;
- Municipal storm water systems must implement best management practices to control mercury discharges and report results annually;
- Dredging and dredge material reuse activities must minimize sediment releases during operations (also prevents release of sediment-bound mercury and methylmercury) and ensure dredged material does not erode back into Delta waterways; and
- Regional Board and others will start work in the American and Feather Rivers and Putah Creek and continue work in Cache Creek to reduce mercury loads by a total of 110 kg/year.

- All dischargers implement reasonable, feasible controls for inorganic mercury. During Phase 1, all dischargers should implement methylmercury management practices as they are identified.

Phase 2 of the TMDL program will require implementation of methylmercury control methods identified in the Phase 1 studies as well as continuation of total mercury reduction efforts described in the Basin Plan Amendment. The Central Valley Water Board funded an evaluation of possible sites and methods for mercury removal in the Sacramento River watershed downstream of major dams (report is available at: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/other_technical_reports/index.shtml). Staff anticipates that the Board and other entities will be able to implement total mercury reduction projects not yet named in the Delta TMDL during Phase 2.

R-438: Staff and other stakeholders agree that the mercury program should take an adaptive management approach. The proposed Basin Plan amendments call for the Delta mercury control program to be adaptively managed. A key part of the adaptive management strategy is review of the entire program by the Board in a public forum at the end of Phase 1.

Community based organizations are mediators between the people we serve and the wider community, including government agencies. We recommend that communities impacted by mercury contamination of fish be included in decisions which affect their health. CBOs such as ours can help to coordinate efforts to educate the communities we serve, and bring their voices to the discussion about what actions should be taken to remove toxins such as mercury from the public waterways.

R-439: Staff agrees that involving community-based organizations and anglers should be involved in decision-making. Staff endeavored to obtain input from community-based organizations during the collaborative stakeholder process. In particular for exposure reduction activities, the proposed Basin Plan Amendment requires the inclusion of affected communities in development and implementation of exposure reduction activities.

18. U.S. Environmental Protection Agency

Letter date: 23 April 2008

From: Alexis Strauss, Director, Water Division, U.S. Environmental Protection Agency (USEPA), Region IX

Thank you for the opportunity to comment on the Proposed Basin Plan Amendment, Draft Staff Report for the Control of Methylmercury and Total Mercury in the Delta Estuary, and the Draft Delta Estuary TMDL for Methylmercury, dated February 2008. We support the Central Valley Regional Water Quality Control Board's (the Board's) efforts to urge the Board to adopt the new water quality objectives and TMDL's at the scheduled adoption hearing in July. Our comments on the draft package are summarized below, and detailed comments are included in the attachment.

We strongly support your decision to complete the TMDLs for methylmercury in the Delta Estuary. These TMDLs use the best available science, and focus on controlling both methylmercury, which is directly linked to methylmercury fish tissue levels, and total mercury, which is a limiting factor for the production of methylmercury. Previous TMDLs for Cache Creek, Bear Creek, and Harley Gulch adopted by the Regional Board have also focused on controlling both methylmercury and total mercury. The science supporting these TMDLs clearly indicates that controlling both methylmercury and total mercury will more effectively reduce fish tissue values to safe levels for both wildlife and Delta anglers, than controlling only total mercury.

R-440: Staff and the USEPA agree that addressing sources of methylmercury as well as inorganic mercury will lower methylmercury levels in fish more effectively than focusing only on inorganic mercury. Staff has and will continue to support this position through further discussions with stakeholders.

We also strongly support the Board in its decision to complete TMDLs for the Delta Estuary prior to completing TMDLs for upstream waters. Fishing in the Delta is an important use to be addressed as quickly as possible, and will help drive the calculations for the tributary TMDL's to follow. We support your strategy of determining the reductions of methylmercury and total mercury necessary for the Delta to achieve safe fish tissue levels, before proceeding upstream, to complete the TMDLs for the water bodies that flow into the Delta Estuary.

R-441: Staff agrees that the Delta's mercury impairment in the Delta should be addressed as quickly as possible to reduce exposure to people depending on Delta fish. At the April 2008 hearing, staff proposed that the Basin Plan Amendment for the Delta stipulate that no Phase 2 methylmercury implementation actions would be required in the Delta and Yolo Bypass until the Board has adopted tributary TMDL control programs. This approach would address many of the Delta dischargers' concerns about fairness while not delaying key mercury control actions and the methylmercury studies that are needed for Delta and upstream control programs.

We understand some stakeholders prefer load and wasteload allocations that focus on total mercury. The draft Basin Plan Amendment proposes to limit both methylmercury and total mercury. We support your approach of limiting methylmercury discharges at current performance on a concentration basis as interim limits, prior to attainment of a water quality-based effluent limit. We would support interim numeric mass-based or concentration-based, methyl and/or total mercury limits, as long as they are designed to hold the discharger at current performance levels or below. At a minimum, we believe

dischargers should be held to current loading in impaired waters, so as not to further exacerbate the problem.

R-442: Staff agrees that in order to ensure that the Delta mercury impairment does not worsen during Phase 1, NPDES-permitted dischargers should be assigned interim limits. Table B in the February 2008 draft BPA contained numeric, methylmercury concentration limits for Phase 1 based on current performance. Staff is continuing discussion with USEPA, NPDES, and other stakeholders over whether Phase 1 limits should be for methylmercury, total mercury, or both. Dischargers have noted that setting limits for methylmercury, even at current levels, could lead to unavoidable exceedances if methods for controlling methylmercury are not clearly understood for every type of treatment system.

The proposed Basin Plan Amendment discusses pilot offset projects during Phase 1 and the development of a permanent offset program during Phase 2. We support this approach. We believe it is important to take advantage of opportunities to gain early reductions of methylmercury and total mercury in the Delta. Although establishing these programs is likely to be complex, we are committed to working with Board Staff and other interested stakeholders to facilitate completion of any pilot projects and a permanent Phase 2 offset program.

R-443: The Board appreciates the offer of USEPA's assistance in implementing pilot offset projects and developing a Phase 2 offset program. Staff agrees that offsets are an important tool to create incentives for early removal of mercury from the Delta and its tributary watersheds. Responses to the letter from CVCWA describe staff's phased approach to offsets in the Delta mercury control program.

The proposed Basin Plan Amendment includes three new methylmercury fish tissue objectives. We support the addition of these objectives and commend your staff on the excellent analytical work supporting them. The new objectives protect both wildlife and human health. The objectives protect threatened and endangered species, as well as Delta anglers who consume 32 grams per day or 8 ounces (one meal) per week of larger fish. The values are appropriate and consistent with the San Francisco Bay Mercury TMDL.

R-444: Staff agrees that the proposed objectives protect people and wildlife that eat Delta fish and should be consistent with the San Francisco Bay Mercury TMDL, as some popular fish species spend time in the Bay and Delta.

As a formality, the positions described in this letter and the attachment are preliminary in nature and do not constitute a determination by EPA under Clean Water Act 303(c) or 303 (d). Approval/disapproval decisions will be made by EPA following adoption of the water quality standards and the TMDLs, and submittal to EPA.

We appreciate the great deal of work that has gone into the development of the Proposed Basin Plan Amendment and supporting documents. We appreciate the opportunity to review and comment. If you have any questions, please contact me at (415) 972-3572, or if your staff members have any questions please have them contact Diane Fleck at (415) 972-3480.

Attachment

U.S. EPA COMMENTS

I. PROPOSED BASIN PLAN AMENDMENT (BPA) TO CONTROL METHYL AND TOTAL MERCURY IN THE SACRAMENTO-SAN JOAQUIN DELTA ESTUARY, FEBRUARY 2008

1. Modifications to Chapter II (Existing and Potential Beneficial Uses)

a. The COMM beneficial use is proposed as a potential use. EPA supports adding COMM as a use, although it is not entirely clear why it is being added as a potential use rather than an existing use. Although EPA regulations do not use the term “potential use,” such a designation is clearly contemplated by EPA regulations when a state determines that a use should not be considered an “existing use.” (“Designated uses are those uses specified in water quality standards for each water body or segment whether or not they are being attained.” 40 CFR 131.3(f)).

Our understanding is that commercial fishing is actually happening in the Delta, but the relevant water quality objectives are not being achieved. In this situation, EPA believes the State has the discretion to add COMM as a potential beneficial use, rather than an existing use. However, it appears that the State may also have the discretion to consider COMM an existing use, and we recommend more discussion of why it is not considered an existing use. For example, the Staff Report indicates that COMM is considered potential rather than existing because the recommended fish tissue objectives are not being achieved in all parts of the Delta; however, the Staff Report also indicates that REC-1 recreational fishing is currently designated an existing use, although the water body is impaired as to that use. We recommend that staff explain why COMM is considered a potential use when REC-1 is considered an existing use. At a minimum, in those segments where the recommended fish tissue objectives are being achieved, and commercial fishing is actually occurring, COMM should be considered an existing use. See Advanced Notice of Proposed Rulemaking, 63 Fed Reg 36754 (“EPA’s current interpretation is that the existing use should be identified either where the use has taken place or the water quality sufficient to support the use has existed since November 28, 1975, or both”) and also discussion of situations in which a use is occurring but water is impaired, 63 Fed. Reg. 36753.

R-445: Staff agrees that since REC-1, which has been understood to include consumption of local fish, is designated in the Basin Plan as existing for the Delta, it may appear inconsistent to designate COMM as potential. Methylmercury concentrations in fish and fishing practices vary across the Delta. The dataset of fish mercury concentrations is extensive, but we do not have fish tissue data for It may be time and resource consuming to decide which modifier (existing or potential; E or P) applies to each Delta waterway. Staff proposes adding the COMM beneficial use for the Delta and Yolo Bypass as an existing use without identifying as E or P. The Regional Board must fully protect E and P beneficial uses identified in the Basin Plan.

b. In the introduction to Appendix 43 on page BPA-21, we suggest clarifying that the proposed COMM use will apply to the waterways listed in Table A43-1, in addition to the proposed methylmercury fish tissue objectives, the implementation program, and the monitoring provisions.

R-446: Staff will add the COMM use to the introduction to Appendix 43.

2. Modifications to Chapter III (Water Quality Objectives)

a. We strongly support the Regional Board’s proposed fish tissue objectives of: 0.24 mg methylmercury/kg and 0.08 mg methylmercury/kg, wet weight, in muscle of TL3

and TL4 fish, respectively (150 – 500 mm total length), for the protection of human health and wildlife that consume large fish; and 0.03 mg methylmercury/kg, wet weight, in whole fish less than 50 mm in length, for the protection of wildlife that consume small fish. This set of objectives is protective of people who eat 32 g/day (one 8 ounce meal per week) of commonly eaten, legal sized fish, and it is protective of wildlife species that consume both large and small fish, including several federally listed threatened and endangered species. This human health consumption rate is consistent with the San Francisco Bay Mercury TMDL, consistent with the consumption rate used by OEHHA to develop fish advisories, and reflects local angler habits.

R-447: Staff appreciates EPA's support of the proposed objectives.

3. Modifications to Chapter IV (Implementation/Delta Mercury Control Program)

a. **TMDLs/Loading Capacity:** The proposed BPA contains a detailed discussion of the allocations and wasteload allocations, and Tables A, B, D, F, and G contain methylmercury load or wasteload allocations by category for: agriculture and wetlands; municipal and industrial wastewater; MS4 dischargers; open waters; and tributary watersheds, respectively. However, the TMDL Staff Report divides the Delta into 8 subareas, and assimilative capacity is calculated for each subarea (see Table 8.2, page 155). In the TMDL Staff Report, load and wasteload allocations are assigned to each subarea, with the total load not exceeding the assimilative capacity of each subarea (see Tables 8.4a through 8.4g, pages 162 – 167). The TMDLs, or loading capacity for each subarea, must be included in the BPA (Table 8.2 from the TMDL Staff Report). We recommend that you include Tables 8.4a through 8.4g from the TMDL Staff Report, in the BPA, to clearly show the loading capacity for each subarea, as well as the load and wasteload allocations assigned to each source, for each subarea.

R-448: To the Basin Plan amendments, staff proposes adding a summary table containing the assimilative capacity, load allocations, and wasteload allocations for each subarea. The summary table contains subtotals of the wasteload allocations for three source categories (NPDES facilities, NPDES facility future growth, and MS4s), with individual facility and system allocations in subsequent tables. This approach should simplify review of the allocations and total load capacity (e.g., verifying that the sum of allocations in each subarea does not exceed the total capacity), while making it easy for responsible parties to find their own allocation requirement.

b. **TMDL Elements:** The proposed BPA does not clearly include a summary of: the numeric targets used in the TMDL analyses; the source analyses for methylmercury and mercury; and the linkage analysis between the sources, targets, loads and allocations. The BPA needs to contain a summary of this information, or the BPA needs to reference the TMDL Staff Report which contains this information.

R-449: The TMDL staff report contains discussions of the numeric targets, source analyses for methylmercury and mercury, the linkage between the sources and targets, and methylmercury allocations. The Basin Plan amendment will contain new water quality objectives and load and waste load allocations, and margin of safety as required by 40CFR Part 130. Reference to these documents will be placed either in the resolution that the Central Valley Water Board will adopt in order to adopt the Basin Plan amendments or in the amendment to Basin Plan Chapter IV. For previous Region 5 TMDLs, reference to the TMDL elements has been placed in the resolution.

c. **Compliance Schedules:** The proposed BPA discusses compliance schedules in NPDES permits to implement the final WLAs for this TMDL. We are pleased to see the language at the bottom of page BPA-2 stating that compliance schedules must be “as short as possible and must be consistent with the requirements of the Clean Water Act, EPA regulations at 40 CFR 122.46, and the State law and regulations.” (However, the cite should be to 40 CFR 122.47, not 122.46.) However, some of the other language in the draft BPA that appears to pertain to compliance schedules is confusing and we recommend it be deleted or changed. The language on page BPA-1, third paragraph under “Delta Mercury Control Program,” could be read to set a minimum length of time for compliance schedules, which is inconsistent with the “as soon as possible” requirement. Additionally, the last two paragraphs on the bottom of BPA-6 are confusing. It is unclear why concentration limits based on current performance should not be effective until three years after the date of the permit, and why an additional compliance schedule of up to ten years would be necessary. Phase 1, performance-based concentration limits, should be in place as soon as such limits can be calculated. The purpose of a compliance schedule is to give a discharger time to implement measures to control methylmercury in order to meet the water quality-based effluent limit (WQBEL). It is not appropriate to use a compliance schedule to implement limits based on current performance, where no new measures would be needed.

R-450: In the February 2008 Basin Plan amendments, a time schedule was proposed for interim methylmercury limits for NPDES facilities because, for most facilities, data characterizing current methylmercury discharges was limited (spanning one year or less). The time schedule provided time for more methylmercury data to be collected in order to have a more accurate understanding of current discharge concentrations and variability. Following discussions with stakeholders, including USEPA, staff proposes that Phase 1 limits for NPDES facilities be in the form of total mercury and based on existing discharge concentrations. Adequate data exist to calculate these limits now. NPDES Facilities would have to be in compliance with Phase 1 total mercury limits starting with the effective date of the Basin Plan amendments.

It is unclear whether Board staff intends to allow compliance schedules for new dischargers (see Table B, footnote j). 40 CFR 122.47(a)(2) places restrictions on which NPDES permits for new facilities may contain compliance schedule provisions. We recommend you review the regulation to ensure your provision is consistent with it.

R-451: For facilities that start discharging after the time that final waste load allocations become effective, staff will follow 40 CFR 122.47 and the State’s compliance schedule policy in determining if a compliance schedule is allowed. Staff revised footnote “j” (Table B footnote “b” in February 2010 version) so that it no longer describes a method for calculating interim methylmercury limits for new facilities. Staff proposes that Phase 1 limits be in the form of total mercury and based on existing discharge (i.e., a cap). New facilities should not need a compliance schedule in order to meet total mercury limit in Phase 1 limit. Staff would require a new facility to monitor for a specified period and amend the permit to include the newly calculated cap. This approach has been used by Regional Board NPDES permit staff in developing caps for other pollutants.

Lastly, the provision on page BPA-15 appears to allow a discharger to extend its schedule past 2030 if it has accrued adequate credits under the proposed offset program. This provision appears to conflict with the clear language on page BPA-2, which allows compliance schedules only up to 2030. Additionally, it is not clear that allowing an additional five years in this circumstance would meet the requirement that the limit be met “as soon as possible.”

R-452: Staff omitted text in the offset program section that would have allowed discharger credit to be used to extend compliance schedules. Staff worked with stakeholders to develop guiding principles for Phase 1 offset projects. The guiding principles did not include trading offset credit for time extension.

The State Water Resources Control Board's statewide compliance schedule policy was adopted on April 15. We urge the Regional Board staff to take a close look at the compliance schedule scheme proposed in this TMDL, to clarify any confusion or inconsistencies, and to ensure that this proposal is consistent with the State Policy and with Federal regulations.

R-453: Staff reviewed federal and State policies as recommended. Staff is working closely with USEPA, Regional Board permit staff, and NDPES dischargers to develop appropriate and acceptable compliance schedule text for the February 2010 draft Basin Plan amendments.

d. Reasonable Assurances: The proposed BPA at Table B, Municipal and Industrial Methylmercury Allocations, includes an allocation for each subarea for new discharges, to account for population growth. The TMDL Staff Report, at pages 155 through 158, under section 8.1.2, Allocation Strategy, states that "...staff recommends that the tributary inputs be assigned percent allocations based on a methylmercury concentration of 0.05 ng/l (rather than 0.06 ng/l) ... Such an allocation... would ensure that assimilative capacity is reserved for ... point source discharges within the Delta/Yolo Bypass..."

Before approving a TMDL in which some of the load reductions are allocated to nonpoint sources in lieu of additional load reductions allocated to point sources, there must be specific reasonable assurances that the nonpoint source reductions will in fact occur. 40 CFR 130.2(i). It is necessary for the Board to explain and demonstrate in greater detail in this TMDL package, how the necessary reductions from the tributaries are reasonably expected by the Board to be achievable and to occur within a reasonable timeframe. We note that the reductions from the Cache Creek Settling Basin Outflow are specifically delineated in the BPA (page BPA-12), and specific timeframes are included. We recommend including a schedule for completing the remaining tributary TMDLs from which reductions are needed and expected to occur.

R-454: Staff will include a schedule for completing tributary TMDLs from which reductions are needed in the BPA, as assurance that tributary allocations will be met. Staff will also include language that upstream mercury control programs must be developed in Phase 1. Staff also clarified the allocation strategy in the draft TMDL Report. Wasteload allocations for within-Delta point sources are calculated using the percent reduction in ambient, aqueous methylmercury needed for each subarea. The wasteload allocations do not depend upon tributary allocations being met. The sentence to which USEPA refers in Section 8.1.2 was omitted.

e. Offset Pilot Project and Offset Program: The proposed BPA discusses pilot offset projects during Phase 1, and the development of a more permanent offset program during Phase 2. We support this approach because we believe it is important to take advantage of opportunities to gain early reductions of total mercury and methylmercury in the Delta. Although establishing such programs is likely to be complex, we are committed to working with Board staff and other interested stakeholders to facilitate completion of pilot projects and a permanent offset program.

However, we are concerned about extending compliance schedules for facilities that earn credits in the pilot program (see comment c. above). We believe it may be more

appropriate for a facility to use credits earned in a pilot offset project, toward meeting effluent limits that are effective in 2030. The amount of credits available for use by the facility should be established as part of the agreement from the proposed pilot project.

R-455: Staff agrees that it is premature for the Basin Plan amendment to allow offset credit to be used to extend compliance schedules before the offset program is fully developed and before staff has any information indicating facilities might not meet allocations unless they gain a time extension with offset credits. Staff is continuing to work with stakeholders, including USEPA, to develop offset program recommendations for the Board. See also response above.

f. NPDES Permit Limits: We support the inclusion of Phase 1 methylmercury concentration limits as interim limits for NPDES dischargers, as included in the proposed BPA, prior to attainment of final wasteload allocations and corresponding final water quality-based effluent limitations (WQBELs). Interim limits to be used during the compliance schedule period, may be mass-based or concentration-based. Interim, numeric, performance-based limits should be calculated to ensure that dischargers are held to current loadings or below. Under the Clean Water Act and EPA regulations at 40 CFR 122.47, compliance schedules must include enforceable interim requirements leading to compliance with a final WQBEL. At a minimum, we believe dischargers should be held to current loadings in impaired waters, so as not to further exacerbate the problem. Additionally, it is our understanding that the state compliance schedule policy will require numeric interim limits when compliance schedules exceed one year.

R-456: Staff agrees that in order to ensure that the Delta mercury impairment does not worsen during Phase 1, NPDES-permitted dischargers should be assigned interim limits. Staff recommends the Basin Plan amendments assign limits for total mercury that will apply during Phase 1, termed interim limits. Staff recommends Phase 1 limits be in the form of total mercury because until methylmercury studies are completed in Phase 1, dischargers may not know how to maintain compliance with methylmercury limits. Staff recognizes that State and federal policy set additional requirements for compliance schedules within NPDES permits. The methylmercury allocations will be enforced in individual NPDES permits. When the wasteload allocations become effective, individual permittees will have to either meet the allocation or justify to the Regional Board why the permittee needs a compliance schedule. A compliance schedule developed for an individual permit will likely have interim limits and requirements (separate from the Phase 1 total mercury limit) to track progress toward meeting the methylmercury allocation, in accord with the State and federal regulations.

g. Phased Implementation: We support the implementation strategy which includes two phases. We agree that it is appropriate in the first implementation phase to focus on developing Characterization and Control studies to evaluate methyl and total mercury concentrations and loads in source waters, receiving water and discharges; identify variables that control methylmercury production; and develop and design feasible control options. Actual implementation of load reduction measures would follow in Phase 2.

The Staff Report anticipates several steps to improve the science and body of knowledge around methylmercury production and management, including setting up a Technical Advisory Committee (TAC) to review and inform the development of the Characterization and Control Studies required by the various stakeholder groups. We agree the Board should use these available regulatory tools. The Board may find additional opportunities for science-based design projects and monitoring projects, such as wetlands restoration projects, by working with the CALFED Science Program and the Delta Regional Ecosystem Restoration Implementation Plan.

R-457: Staff appreciates the suggestion to work with other Delta-focused ecosystem and restoration programs. Staff will be working with stakeholders to identify common goals and leverage resources during the Phase 1 studies.

h. Delta TMDL and Tributary TMDLs: We strongly support the decision to complete TMDLs for the Delta Estuary prior to completing TMDLs for upstream waters. Fishing in the Delta is an important use to be addressed as quickly as possible, and will help drive the calculations for the tributary TMDLs to follow. We support the strategy of determining the reductions of methylmercury and total mercury necessary for the Delta to achieve safe fish tissue levels, before proceeding upstream, to complete the TMDLs for the waterbodies that flow into the Delta Estuary.

Completing the TMDL for the Delta is timely, given the imminent changes in the Delta that may exacerbate methylmercury production and exposure. The Board's schedule for addressing CWA 303(d) listed water bodies anticipates working on TMDLs for some upstream areas concurrently with Phase 1. The 2006 CWA 303(d) list indicates that staff will work in 2008 and 2009 on TMDLs for the Feather River and portions of the American River. We support this approach. However, we note that although the San Joaquin watershed contributes significant methylmercury loads to the Delta, there does not appear to be any near-term work on mercury TMDLs for this region. Mud Slough has been documented as a source based on recent studies (C.G. Foe and S.M. Louie, "Methyl Mercury Concentrations and Loads in the Central Valley," 2006, CALFED funding) but is not listed as impaired for mercury. Future changes in the management of water entering and moving through the Delta (changes that may alter salinity, dissolved oxygen, and other factors affecting mercury cycling) could alter net methylmercury production within the Delta. The Board and other agencies will need to evaluate the consequences of proposed actions for which it has oversight. We encourage the Board to move forward with monitoring and characterization studies to improve information on mercury inputs and other water quality parameters in the San Joaquin watershed.

R-458: Staff added a time schedule for upstream TMDLs to be completed in Phase 1. This schedule includes the San Joaquin River. While tributaries to the San Joaquin River are not specifically listed in the draft Basin Plan amendments, they will be included in the source analysis and implementation plan for the San Joaquin River TMDL. Mud Slough is an important source of methylmercury to the San Joaquin River and will be addressed. Staff is not aware of fish samples collected in Mud Slough, though, that would prompt a separate listing of Mud Slough as impaired by mercury.

R-459: Staff agrees that changes in water management in the Delta could affect methylmercury production, transport, and degradation and should be evaluated. Staff worked with agencies through stakeholder process and will continue to improve coordination with DWR, State Board water rights, and other agencies and planning efforts. The October 2008 CALFED study reports include methylmercury and total mercury load analyses for the San Joaquin River.

i. Technical Advisory Committee (TAC): We support the formation of a TAC to review the study designs, evaluate results, and make recommendations on the proposed management practices contained in the Characterization and Control Studies. We recommend you consider drawing on the expertise of the CALFED Science Program and Independent Science Board in developing the TAC and defining its charge. EPA staff will continue to work with Board staff on determining whether EPA resources are available to assist with this effort.

R-460: Staff appreciates EPA's offer to investigate possible EPA funding contributions for the TAC. As recommended, staff will draw on the experience of CALFED's independent

science review process and others in forming the TAC for Phase 1 activities. Staff continuing to seek funding and work with stakeholders to develop role of the TAC.

j. Risk Management Program: We strongly support the Risk Management component of the implementation strategy, in which the Regional Board will work with public health agencies to reduce human exposure through consumption of contaminated fish. The Fish Mercury Project, a major inter-agency collaboration funded through the CALFED Program, has included education and outreach to ethnic communities engaged in subsistence and recreational fishing. These public health programs are needed as long as we have elevated mercury levels in sport fish.

R-461: Staff agrees that exposure reduction activities conducted with people who eat Delta fish are needed reduce fish consumers' exposure to mercury while mercury and methylmercury source reductions are occurring. Staff is continuing to work with stakeholders and California Department of Public Health to develop the program.

4. Modifications to Chapter V (Surveillance and Monitoring):

Fish Methylmercury Compliance Monitoring: The BPA proposes that the Regional Board will initiate fish tissue monitoring five years after dischargers implement projects to reduce methylmercury and total mercury discharges, and compliance monitoring will take place every ten years thereafter, at one location within each subarea. We urge more frequent compliance monitoring, such as compliance monitoring on a 5 year basis, and, where significant changes in methyl or total mercury concentrations or loading are occurring, on a yearly basis. Changes in methylmercury levels in fish can vary on a yearly basis. Compliance monitoring on a 10 year basis would not allow the Board to determine whether changes in the strategy are necessary, in a timely manner.

We commend the State Board and the San Francisco and Central Valley Regional Board staff for working to develop a comprehensive Delta-wide monitoring program as part of a strategic workplan for the Delta. This initiative has our full support. We expect that the TMDL monitoring will be folded into the broader monitoring program.

R-462: Staff is not depending only on fish methylmercury compliance monitoring to evaluate the effectiveness of within-Delta methylmercury load reductions. The purpose of fish methylmercury compliance monitoring is to evaluate whether fish tissue objectives are attained. Because tributaries contribute significant portions of methylmercury loads, staff does not expect that fish tissue objectives will be attained until source controls are implemented in tributaries. Concentrations of methylmercury in large TL3 and TL4 fish represent aqueous methylmercury conditions over time. Monitoring of these fish will indicate whether across the subareas and over time, the sum of implementation actions was effective, but is not the most effective method of identifying need for adaptive management of control strategy for particular sources or locations. The proposed amendment to Basin Plan Chapter 5 also contains guidance and requirements for water monitoring that will occur during implementation of source controls by with-Delta sources. Staff will use water monitoring data and reporting of management practice implementation in adaptive management. Small fish are also good indicators of methylmercury conditions. Staff will also use small fish bioindicator data as it is collected in adaptive management considerations, but is not requiring that dischargers monitor small fish.

R-463: Staff agrees with USEPA that a comprehensive, regional monitoring program is desirable. Staff will continue to work for a regional monitoring program that includes the Delta and fish tissue monitoring. Non-TMDL driven monitoring programs, such as the Surface Water Ambient Monitoring Program (SWAMP), the CALFED-funded Fish Mercury Project, and the

Toxic Substances Monitoring Program, actually produced most of the fish tissue data used in the TMDL. Non-TMDL driven monitoring programs are likely more effective at ensuring resources are available for strategic, regular monitoring of Delta fish for protecting human and wildlife health than the Basin Plan amendment.

II. STAFF REPORT: SACRAMENTO-SAN JOAQUIN DELTA ESTUARY TMDL FOR METHYLMERCURY, FEBRUARY 2008

1. Methylmercury: We strongly support the decision to complete TMDLs for methylmercury in the Delta Estuary. These TMDLs use the best available science and focus on controlling both methylmercury, which is directly linked to methylmercury fish tissue levels, and total mercury, which is a limiting factor for production of methylmercury. Previous TMDLs for Cache Creek, Bear Creek and Harley Gulch adopted by the Regional Board have also focused on controlling both methylmercury and total mercury. The science supporting these TMDLs clearly indicates that controlling both methyl and total mercury will more effectively reduce fish tissue values to safe levels for both wildlife and Delta anglers, than controlling only total mercury.

The Staff Report explains that controlling methylmercury will be more effective to reduce fish tissue values, than regulating total mercury. Although mercury is widely distributed within the watershed, the most significant sources of methylmercury are associated with processes which result in net methylmercury production. Subareas with equal inputs of mercury may have quite different rates of methylmercury production. We know from research and practice (e.g., through various CALFED-funded studies) that a number of the factors controlling methylmercury production are anthropogenic and/or are subject to manipulation. Improving our ability to attenuate or avoid methylmercury production in key areas (e.g., existing or potential hot spots) is more promising than a less targeted approach. Various expected changes in the Delta such as water conveyance projects and restoration of wetlands and floodplains, could significantly affect methylmercury levels and are important reasons to focus on better understanding and managing the mercury in this environment.

2. Source Analysis, Numeric Targets, Linkage Analysis, TMDL and Loading Capacity, and Allocations: We commend staff on their excellent analytical work. The source analyses for methylmercury and total mercury are well-developed and thorough. The numeric targets, which are the proposed fish tissue objectives, are reasonable and appropriate; they protect Delta anglers as well as threatened and endangered wildlife. The linkage analysis reflects exceptional, cutting-edge science. The TMDL and loading capacity analyses, and the load and wasteload allocations are reasonable. The Margin of Safety, Seasonal Variation and Critical Conditions analyses are appropriate. The TMDL document is thorough and sound; it reflects extraordinary work.

R-464: Board Staff appreciates USEPA comments. No further Staff response needed.

19. U.S. Fish and Wildlife Service

Letter date: 24 April 2008

From: Daniel Welsh for Michael B. Hoover, Acting Field Supervisor,
U.S. Fish and Wildlife Service (USFWS)

First we would like to compliment the Central Valley Regional Water Quality Control Board (Regional Board) staff on the high quality of work they have done over the past several years on the difficult task of developing a methylmercury total maximum daily load (TMDL) for the Sacramento-San Joaquin Delta.

The U.S. Fish & Wildlife Service (Service) has worked with the U.S. Environmental Protection Agency (EPA) and Regional Board staff on a methodology to develop mercury fish tissue objectives that will be protective of fish and wildlife resources including threatened and endangered species. This process began when we evaluated EPA's 0.3 mg/kg mercury fish tissue criteria to determine whether it would be protective of federally listed endangered and threatened species in California (USFWS, 2003). Regional Board staff then fine tuned that methodology to develop the Cache Creek mercury objectives. Both of those documents received positive independent peer review. Regional Board staff have used this methodology to develop the Delta fish tissue methylmercury objectives to protect fish and wildlife resources. The Service believes these proposed methylmercury objectives of 0.24 mg/kg for trophic level 4 fish and 0.03 mg/kg for fish less than 50 mm in length will be protective of listed species and other fish and wildlife resources in the Delta. As we have noted previously these values should not be cast in stone and should be reevaluated as new data become available.

[R-465](#): Staff appreciates USFWS's assessment that staff's recommendations for water quality objectives in fish tissue will protect threatened, endangered, and other wildlife species in the Delta.

According to the Regional Board staff report more than three-quarters of all methylmercury loading into the Delta comes from "open water" and "tributary" sources. Many stakeholders have noted that these sources are not addressed in the proposed TMDL because they cannot be attributed to any specific responsible party. We recognize that the Regional Board staff have not ignored these loads and are working hard to address them in future TMDLs. However, it may be premature to implement actions in the Delta before upstream TMDLs are developed. We suggest that the Regional Board not fully implement the Delta TMDL until the other TMDLs are completed and the Regional Board can consider the entire Central Valley as a whole and then prioritize implementation actions. That is not to say there are no high priority actions that can be taken now and in the near future. These actions should address public education, research, pilot projects, hot spots, and urban source control.

[R-466](#): Multiple stakeholders requested that the Board address methylmercury sources in the tributary watersheds as well as in the Delta. Staff further discussed this topic during the stakeholder process. In response, to the draft February 2010 Basin Plan amendments, staff added a schedule for upstream TMDLs to be completed during Phase 1 of implementation. Staff agrees that the actions proposed in Phase 1 of the Delta implementation plan, including control of mercury discharged from urban stormwater systems, wastewater treatment facilities and the Cache Creek Settling Basin, allowing pilot projects for offsets, human health risk management, public education, and methylmercury studies, are high priority and should occur while upstream TMDLs are developed.

The Service supports the Regional Board's use of methylmercury as the form to regulate as it is most closely correlated with bioaccumulation and impacts. We do not see using total mercury as the ideal form to regulate since the percentage of methylmercury can vary widely. The use of both to implement a TMDL and monitor water quality may be possible to lower monitoring costs; however, adequate characterization of the mercury discharge must be done with periodic confirmation.

R-467: Staff agrees that the water quality objectives and allocations should be in the form of methylmercury because methylmercury is linked more closely to human health and wildlife health concerns than total mercury. Staff believes that addressing sources of methylmercury as well as inorganic mercury will lower methylmercury levels in fish more quickly than focusing only on inorganic mercury. Staff agrees that allowing some flexibility in choice of the analyte for monitoring may save money. For example, the draft Basin Plan Amendment allows fish tissue concentrations to be monitored for mercury instead of methylmercury, because nearly all mercury in the fish of interest is in the methylmercury form. Total mercury is also appropriate for monitoring at sources where the pollutant of greatest concern is inorganic rather than methylmercury, such as runoff from a mine site.

The Regional Board should clearly articulate whether the 0.06 ng/l methylmercury concentration in water is "goal" or a formal regulatory number. Having both a fish tissue objective and a water objective will be confusing and we recommend against this approach.

R-468: Other stakeholders and some Board members expressed concerned about possible confusion created by the 0.06 ng/L goal for methylmercury concentration in ambient Delta water and whether it could be used by Board staff in the future as a regulatory limit. As a result, staff proposes revisions to the draft Basin Plan amendment to address these concerns. Staff removed the references to the 0.06 ng/l ambient goal in the draft Basin Plan amendment so that Board staff and others do not misinterpret the goal as an effluent or receiving water limit. A description of how the goal was used to develop the Basin Plan allocations and study requirements will remain in the staff reports.

Regarding offsets, it seem logical to first evaluate whether an entity cannot truly identify and reduce sources of mercury in their discharges and at what costs before including them in an offset program. The offset program should also consider the local impacts of a discharge before the discharger can be considered for an offset program.

R-469: Significant policy decisions, such as on-site requirements that must be satisfied before an entity may complete an offset project, the system for valuing and using offset credits, and whether an offset project may be located outside of the entity's watershed, still must be made during creation of a full offset program. In the February 2008 Basin Plan Amendment, staff proposed guidelines for a pilot offset program that could facilitate relatively quick removal of mercury while the full offset program is developed. The pilot offset program would require dischargers proposing offset pilot projects to determine the feasibility of on-site controls for methylmercury. Staff and stakeholders discussed offsets during the stakeholder process. From these discussions came a set of key principles to guide offset projects that staff added to the February 2010 Basin Plan amendments. Among the key principles are: an offset project should only be allowed after a discharger implements reasonable control measures on-site and an offset project should not be allowed if local wildlife or human communities are disproportionately affected by insufficient actions on-site.

We are also supportive of the characterization and control program; however, it needs to be fine-tuned over the coming years as we learn more about mercury from the research that is being conducted in the Bay/Delta and elsewhere. We cannot afford to lose the momentum created by the CalFed Mercury Program because it will be very difficult to get it moving again should it falter. Approval of a Delta TMDL can help provide the incentive to keep us moving forward.

We will continue to work with Regional Board staff on implementing the Delta mercury TMDL and developing future mercury TMDLs. Please contact Mr. Tom Maurer (916) 414-6594 should you or your staff have any questions on our comments.

R-470: Staff agrees that requiring methylmercury studies as part of the Delta TMDL will encourage continuation of the type of research begun under the CalFed Mercury Program. To promote effective studies, staff proposed that parties collaborate to conduct studies and that the Board work to form an independent technical advisory committee (TAC) to review study plans and results. Staff also agrees that it is important to build on and avoid repeating work that the CalFed Mercury Program and others have completed. Experiences of members of the TAC and websites containing CalFed-funded research (such as: <http://mercury.mlml.calstate.edu/> and <http://www.sfei.org/cmrr/fishmercury/>) will help, but more could likely be done to keep study planners informed.

20. Yolo County Flood Control and Water Conservation District

Letter date: 23 April 2008

From: Tim O'Halloran, General Manager, Yolo County Flood Control and Water Conservation District

The Yolo County Flood Control and Water Conservation District is involved in a number of resource management efforts that seek to integrate a broad set of interests that include minimizing and abating impacts of pollutants, including mercury. Many of our efforts involve waters from Cache Creek and aspects of the Cache Creek settling basin, so we have a keen interest in elements of the TMDL that affect these resources. In pursuing our work we are confronted with the need to balance the various needs while making progress on all fronts. To this end, we think there are some features of the proposed TMDL that could be changed to improve our ability to serve multiple needs while also creating a better framework for management of mercury problems.

1. Specifically Consider the Need for Multi-benefit Management Outcomes.

The TMDL provides opportunities to describe why certain goals may be infeasible to attain. But it should also allow for over-riding considerations that fall short of being technically infeasible. In cases where other competing benefits would be significantly harmed by pursuing mercury controls, there should be a way to avoid this harm. In such cases, the maximum mercury control that is practical should be required.

R-471: At this point, we do not know which methylmercury control requirements are technically infeasible or would conflict with other resource management goals, such as flood control. At the end of the Phase 1 study period, entities assigned methylmercury allocations should report to the Board their possible methylmercury control methods and feasibility of plan for meeting the methylmercury allocations. The proposed Basin Plan amendments commit the Regional Board to reviewing methylmercury controls, including whether implementation of some methods would negatively impact other resource activities, and adjusting methylmercury allocations as needed. It is important to remember, however, that the purpose of the TMDL implementation program is to remove the methylmercury impairment, as required under the federal Clean Water Act. If some sources are unable to reduce methylmercury, the methylmercury allocations for other sources may have to become more stringent.

2. Allow for Management of Bioaccumulation Processes.

The TMDL focus is on concentration and mass while the problem is defined in terms of bioaccumulation. The TMDL should anticipate the possibility of a means for changing the bioaccumulation rates and provide a way to shift the mass and concentration targets if bioaccumulation can be, or is, altered.

Possible language: BPA page 1, under "Delta Mercury Control Program" in first paragraph, 3rd sentence add to the end of the sentence: *, and allows adjustment of these control measures based on changes in bioaccumulation.* BPA page 3, under Phase 2 Characterization and Control Studies, 1st paragraph, insert new sentence after 2nd sentence: *Characterization studies may include assessment of bioaccumulation. Control studies may include evaluation of methods to change bioaccumulation and uptake rates of methylmercury*

R-472: Staff does not believe that a blanket statement of "Delta Mercury Control Program....allows adjustment of control measures" is legally appropriate for the Basin Plan.

Changes to requirements placed in the Basin Plan, such as the methylmercury allocations, must occur during a public hearing after opportunity for public comment. However, the draft Basin Plan amendments commit the Regional Board to following an adaptive management approach and to a thorough review, in public forum, of the proposed control program at the end of Phase 1, before methylmercury controls are required to be implemented. The review includes Board consideration of proposed changes to the Delta mercury control program in the Basin Plan that are based on information collected during the Phase 1 study period. For the Basin Plan amendment text, staff limited description of the control study components to what is required in control study reports. The breadth of stakeholders' studies may be greater than what is typically expected, including studying ways to affect bioaccumulation and uptake. Staff would actually welcome information about effective methods to affect bioaccumulation because they would provide another tool for reaching the ultimate goal of fish that can be safely eaten by humans and wildlife species.

3. Consider the Cache Creek Settling Basin to have a limited life expectancy

The TMDL envisions using the settling basin as a permanent interruption or control on sediment transport. From several perspectives this may be a shaky assumption and is not likely to be sustainable. The current configuration of the settling basin was designed with a life expectancy of 50 years. That 50 year term assumed that the basin would experience a 50% trapping efficiency over its lifetime. The TMDL calls for increasing trapping efficiency to 75%, which would shorten the useful life of the basin. Also current law requires Sacramento, Woodland, and other cities throughout the valley to develop plans and programs for flood protection for the once in 200 years storm event. The settling basin is a key landscape feature that influences flooding in both Woodland and Sacramento. It is possible that providing 200 year protection for these cities will require changes to the basin, and possibly to other parts of the Yolo Bypass. Also the Department of Water Resources is charged with reassessing the flood protection system. This reassessment may lead to a resizing of the Bypass capacity, which would undoubtedly affect the settling basin. The TMDL anticipates some of the changes to the features of the bypass, but looks to the settling basin as a permanent feature. For flood management purposes the bypass acts as an integrated system. Changing one feature has implications for the other features, which means the TMDL should anticipate possible changes to the settling basin. In a larger context the TMDL needs to seek implementation strategies that provide for the natural processes of sediment transport while minimizing mercury exposure in the delta.

R-473: Staff worked with staff of the Yolo County Flood Control and Water Conservation District, Department of Water Resources (DWR), Central Valley Flood Protection Board (CVFPB), and the US Army Corps of Engineers (USACE) to revise Basin Plan amendment requirements related to the Cache Creek Settling Basin. Staff proposes a schedule by which DWR, CVFPB, and USACE would provide a feasibility analysis of reducing loads of mercury leaving the basin by up to 50% of existing loads. The Regional Board would determine mercury control requirements for the settling basin after review of the feasibility report and in conjunction with involved agencies. Staff also assigned the methylmercury load allocation to "Cache Creek" instead of to the Cache Creek Settling Basin outflow to recognize a possible future flood protection system for Woodland that would route Cache Creek floodwater directly to Yolo Bypass. Staff will continue to work with the above agencies, which also have management responsibility for other parts of the Sacramento area flood protection system.

4. Clarify key terms and responsibilities

If the relationship between sediment or total suspended solids (TSS) and mercury transport is sufficiently strong, the TMDL should instruct that sediment or TSS monitoring

will be conducted, and specify the conversion factors for estimating mercury loads based on these other parameters. If the relationship between mercury and sediment or TSS is not sufficiently strong the TMDL should eliminate references to sediment controls and focus only on the mercury levels. Directing the use of sediment or TSS monitoring in lieu of mercury or methyl mercury monitoring would greatly reduce monitoring costs.

R-474: The relationship between methylmercury and TSS is not uniformly strong enough to replace monitoring of methylmercury with TSS. However, following discussions with stakeholders, staff proposes reducing the amount of monitoring required during Phase 1 by requiring only studies focused on methods to control methylmercury, not both methylmercury source characterization and control.

Define what is meant by having "the potential to increase ambient methylmercury levels" or how one would evaluate this potential. Perhaps a list of land use changes that would trigger this potential is the easiest way to approach the issue. The TMDL notes that land use changes from agriculture to wetlands creates this potential. What other land use changes create the potential? This is important to clarify which lands need characterization studies.

R-475: Staff will consider rephrasing. The potential to increase ambient methylmercury levels could also be phrased as the likelihood that a project will make a measurable difference in methylmercury concentrations (fish or water). For new projects, methylmercury production will not be known but will have to be estimated. Staff anticipates the process and level of detail to be similar to consideration of other potential environmental impacts currently required for compliance with the California Environmental Quality Act. Determining the likely impact on methylmercury will be project-dependent. Staff did add to the general list of agencies and water and sediment management activities that should be involved (See BPA pg 10 of the February 2010 draft Basin Plan amendments). In response to many stakeholder requests for greater State responsibility in addressing the mercury problem, staff proposes that State and federal agencies whose projects affect the transport of methylmercury and mercury through the Yolo Bypass in Delta be required to conduct Phase 1 methylmercury control studies. Note that following stakeholder process discussions, characterization studies are not required.

Define how "net source of methylmercury" should be determined. One approach is to measure mercury load based on Julian days for a period of at least 12 months and at least 1 measurement per month for waters coming into and leaving lands subject to this characterization. Load measurements require concentrations and volumes. Concentrations should be measured using sediment or TSS as suggested above with the appropriate conversion factors identified by the Regional Board. Water volume should be measured using delivered or pumped water amounts where available, or using velocity measures and cross sectional areas, or using hydraulic models.

Thank you for the opportunity to provide comments on the TMDL. Should you have any questions regarding these comments, please contact me.

R-476: In the draft Basin Plan amendment, the concept of "net methylmercury source" applies to managed wetlands and irrigated agriculture. These sources are responsible only for the net methylmercury load exported to Delta waters (total load exported minus load in the operation's source water). Staff's method for calculating net methylmercury loads is described in the TMDL Staff Report Chapter 6. Dischargers will need to monitor for methylmercury, as described above, but extensive sampling and rigorous flow modeling is not needed to demonstrate the net loads.