STATE OF CALIFORNIA -- CALIFORNIA NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
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March 29, 2012

Via Email to commentletters@waterboard.ca.gov

Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 "I" Street, 24th Floor
Sacramento, CA 95814-2828

Re: Statewide Mercury Policy, Mercury Control Program for Reservoirs

Dear Ms. Townsend,

Thank you for the opportunity to comment on the proposed subject program. The Department of Water Resources (DWR) operates and maintains numerous reservoirs throughout California. These reservoirs serve as the backbone for the State Water Project (SWP) which stores and distributes water to supplement the needs of urban and agricultural water users in Northern California, the San Francisco Bay Area, the San Joaquin Valley, Central Coast, and Southern California. Seven reservoirs operated by DWR have been listed as Section 303(d) candidates for water bodies designated as mercury impaired at the State Water Resources Control Board's (State Water Board) mercury web site. They include:

- Castaic Lake
- Del Valle Reservoir
- Lake Oroville
- O'Neill Forebay
- Pyramid Lake
- San Luis Reservoir
- Thermalito Afterbay

The DWR offers the following CEQA scoping comments to the State Water Board for its consideration in connection with its development of a Statewide Mercury Policy and Mercury Control Program for Reservoirs.

I. Existing Regulatory and Permit Requirements

The State Water Board's Summary for CEQA Scoping Meetings states that the control program mercury-impaired reservoirs will likely include changes in approaches to reservoir management. Existing regulatory and permit requirements under which DWR operates severely restrict DWR's operational flexibility. Any program that proposes a change to reservoir management or operational procedures must therefore take into account the litany of existing conditions currently imposed on DWR. DWR reservoirs serve multiple purposes including: water storage, flood control and recreation. Existing state and federal programs mandate the terms and conditions of operation in order achieve water delivery goals, water quality goals, environmental goals, and power generation.

The State Water Board's Revised Water Right Decision 1641 (D-1641) and the license issued by the Federal Energy Regulatory Commission (FERC) are two major factors that influence, and restrict how, DWR operates and manages its reservoirs.

Revised Water Right Decision 1641 (D-1641) was adopted by the State Water Board in December 1999, and revised in March 2000. It stipulates the water quality and water right requirements for the Bay-Delta Estuary. Under D-1641, DWR must meet certain terms and conditions to protect the beneficial uses of the Sacramento-San Joaquin Delta (Delta). Included are flow/operational criteria for fish and wildlife as well as water quality objectives to protect beneficial uses such as municipal and industrial, fish and wildlife, and agricultural.

DWR facilities affected by D-1641 include the Oroville Project, Banks Pumping Plant, and San Luis Reservoir. D-1641 also affects a number of other permits and licenses including USBR's Friant, Shasta, Trinity, Folsom, and New Melones Projects, as well as local irrigation and water districts. Non-compliance with the D-1461 could result in adverse actions such as cease and desist orders.

Certain SWP facilities, including the Oroville Facilities, are operated pursuant to licenses issued by the Federal Energy Regulatory Commission (FERC). These licenses include additional terms and conditions that DWR must comply with, such as temperature requirements in the lower Feather River. In addition to state and federal regulatory and permit requirements, DWR is a party to numerous negotiated agreements and contracts that relate to water deliveries. The impacts to water deliveries are set forth in the March 30, 2012 comment letter from the State Water Contractors, Inc. on the statewide mercury policy. DWR joins with the State Water Contractors, Inc. in those comments as if set forth in this letter.

The above requirements limit DWR's operational flexibility on reservoir management. Therefore, any proposed changes to reservoir management or operations must account for these existing operational mandates/constraints (including others that have not been listed) and any conflicts that may arise.

II. Allochthonous processes or sources

Many of DWR's affected lakes or reservoirs are filled entirely or, to a large degree, by water conveyed from outside of their respective watersheds. Specifically, they include those that are situated south of the Delta: Castaic Lake, O'Neill Forebay, Del Valle Reservoir, Pyramid Lake, and San Luis Reservoir. These water bodies are filled with exports predominantly pumped from the Delta. O'Neill Forebay, for instance, serves essentially as a conveyance for flows from the Delta or water released from San Luis Reservoir and sent down the San Luis Canal or Delta Mendota Canal. Almost all of the loads of mercury entering this water body would originate from the Delta or reservoir releases due to the very small surrounding watershed. This is also the case for San Luis Reservoir. Estimates of natural runoff to San Luis Reservoir from the surrounding watershed have been determined to be relatively negligible.

SWP lakes in Southern California (Pyramid and Castaic) receive more water as runoff from their surrounding watersheds, but natural inputs still make up a relatively small portion of the total fill volume. For instance, natural runoff to Pyramid Lake comprised from 0.9% and 2.6% of the total volume of water entering the lake (natural + generation at William E. Warne Powerplant) in 2002 and 2003, respectively.

The above water flow information suggests that mercury loads to many SWP reservoirs originate largely from water entering the Delta and then leaving it in SWP exports. As such, control measures that focus on regulating or remediating activities within the watersheds of SWP reservoirs south of the Delta may not significantly affect mercury levels. Further, much of the mercury from south Delta exports entering SWP lakes may already be in the methylated form. This is supported by the fact that Delta waters are already listed as mercury impaired, suggesting that methylmercury is already present in concentrations that can cause food chain concentrations to exceed those that produce criteria exceedances. If the mercury loads entering SWP reservoirs from Delta exports are primarily in this form, then reservoir management or operational changes proposed to prevent methylation of inorganic mercury may be ineffectual at changing methylmercury concentrations enough to reduce fish tissue concentrations to decline below existing criteria. Therefore, any proposed mercury control program that incorporates loading estimates must include the measurement of methylmercury (not just total mercury) entering SWP reservoirs from Delta exports to account for reservoir management or operation practices not responsible for the methylated fraction already existing from simple reservoir filling.

Conversely, Oroville is situated in a watershed that saw widespread use of mercury for mining, and it has been acknowledged by the State Water Resources Control Board that much of the mercury in the watershed is a result of California's mining legacy. However, like the example of reservoirs that receive water conveyed throughout the Delta, the predominant drivers of mercury levels in the reservoir are past and present activities outside of the reservoir itself, as well as outside of the control of DWR. Hence any mercury control program applicable to Oroville and other similarly situated reservoirs must take account of and provide for the control of mercury contributions from tributary waters (whether the result of point or non-point source processes).

Any statewide program to control mercury must consider that reservoir operators have little to no control over mercury releases occurring outside of the reservoir watershed or, as the Oroville example demonstrates, within the reservoir watershed. In the case of reservoirs that receive SWP exports, Delta waters are already listed as mercury impaired and a TMDL program has been approved. If the TMDL process developed specifically for the Delta is ineffective in achieving its goals, then the amount of mercury entering DWR reservoirs would likely not be reduced. Likewise if no provision is made for the control of mercury originating upstream of Oroville or other reservoirs, then the amount of mercury loading in those reservoirs is unlikely to be reduced in any significant way.

As the foregoing discussion demonstrates each reservoir is unique and the particular factors that influence mercury content differ from one place to the next. Hence any proposed policy or control program must adequately provide for flexibility in its goals, objectives and implementation to allow for regulatory requirements to be tailored to local conditions.

III. Technical Information Gaps

CEQA requires that decisions be based upon evidence. Multiple, extensive, knowledge gaps currently exist regarding mercury cycling and trophic uptake processes involved within reservoirs. Much of the current knowledge regarding the biogeochemical cycling of mercury in aquatic environments is based on specialized, research-level studies. An example of the considerable difficulty in assigning specific processes or sources to mercury contamination was illustrated in the 2008 Technical Support Document for Mercury TMDL prepared for the USEPA and Santa Ana Regional Water Quality Control Board. This document performed an exhaustive review of existing data and listed the following data gaps and knowledge uncertainties:

- *Fish data from the lake are sparse. While the presence of problem concentrations of mercury in fish has been confirmed, the limited number of samples and limited number of collection times leads to uncertainty regarding the average population response as a function of fish weight/age.*

- *No data are available on small forage fish and invertebrates, which drive the food chain pathways leading to bioaccumulation in sport fish.*

- *Sediment mercury concentrations are characterized by a limited number of samples.*

- *No water column or sediment methylmercury data has been collected in the lake or tributaries.*

- *Information on the vertical distribution of mercury in the water column and associated water chemistry is not available for the May 2008 sampling event (the only lake sampling event using ultra-clean sampling and analysis techniques).*

- *The processes in the watershed and lake leading to increased concentrations of methylmercury in the water column have not been quantified.*

> • *Neither available resources nor available data allowed for the development and calibration of a detailed lake mercury cycling model for Big Bear Lake. Instead, the estimates of loading capacity for Big Bear Lake are based on the assumption of an approximately linear relationship between mercury loading and MeHg exposure concentrations in the reservoir…*

Each of these points may require large, detailed research studies just to initiate the process of filling the knowledge and data gaps within a reasonable degree of assurance. Based on these major uncertainties, DWR recommends that the development of statewide policy and mercury control program for reservoirs (potentially including a TMDL) should first focus on filling these data gaps and knowledge deficiencies before proceeding with program approval to avoid unnecessary resource expenditures.

IV. Economic Impacts

DWR would like to remind the State Water Board that it is currently poised to incur substantial costs associated with the implementation of Phase 1 of the Delta TMDL. Any statewide program proposed to control mercury in SWP reservoirs should consider the associated economic costs and derived benefits.

As discussed above, multiple, detailed research studies would likely be needed for each reservoir to adequately define the processes causing the water quality limited listing and to remove any uncertainties prior to developing a TMDL action plan. The costs of conducting these studies could be considerable, given the specialized and technical nature of measuring the metrics associated with mercury in a variety of matrices (i.e. ultra-clean sample collection and preparation, fish tissue excision experience, specific lake chemistry methylation dynamics, lake profile strata influences, etc.). The costs associated with conducting mercury studies in many SWP reservoirs would be especially exorbitant due to their large size. For instance, the 2008 study mentioned above assessed Big Bear Lake, a relatively small reservoir with a storage capacity of 73,370 acre feet (af). In comparison, the storage capacities of several SWP reservoirs are much higher:

- Lake Oroville: 3,553,405 af
- San Luis Reservoir: 2,027,835 af
- Pyramid Lake: 169,901 af
- Castaic Lake: 319,247 af

The cost to eliminate uncertainties associated with mercury behavior in a relatively small reservoir to initiate a regulatory program of action would rise substantially to address the same uncertainties within certain SWP reservoirs simply due to their larger size.

Besides the costs of filling data and knowledge gaps, the economic impacts of any proposed control measures is of great concern. One example provided in the State Water Boards' Summary of CEQA Scoping Meetings (March 2012) was reservoir aeration. Aeration of a reservoir the size of Lake Oroville, for example, would be a huge undertaking with a significant price tag. Furthermore, it was not stated whether this technique has been proven to be a standard practice for reducing mercury methylation in reservoirs with associated measurable reduction rates. Given these potentially huge economic consequences and that cost increases of any program to control/reduce mercury in SWP reservoirs would be passed on to SWP water contractors statewide in the form of higher water purchase costs, impact analyses should be conducted to evaluate the costs/benefits of any statewide reservoir mercury control program.

DWR appreciates the opportunity to comment on the proposed project. If you have any questions, please contact Anthony Chu, Chief, Environmental Assessment Branch, Division of Operations and Maintenance at (916) 653-9978 or Barry Montoya at (916) 653-4383.

Sincerely,

Anthony Chu, Chief
Environmental Assessment Branch
Division of Operations and Maintenance