



**Delta Tributaries Mercury Council**  
**~ Meeting Minutes ~**  
**Tuesday, 16 September 2008**  
**12:30 p.m. – 4:30 p.m.**

**Sacramento Regional County Sanitation District**  
**Conference Room 162**  
**Mather, CA**

**Facilitator:** Stephen McCord, LWA

**Meeting Minutes by:** Stephen McCord, LWA

### **Attendees**

#### In Person

Roger Hothem, USGS

Janis Cooke, CVRWQCB

Vicki Fry, SRCSD

Douglas John, CA Dept of Conservation

Jody Johnson, Shaw E & I

Dave Lawler, BLM – CASO

G. Fred Lee, G. Fred Lee & Associates

Bill Whiteside, Blue Sky Technologies

Tim Stevens, Cal. Dept. Fish & Game

John Henderson, US Fish & Wildlife Serv.

Sara Martin, SRWP

Patrick Morris, CVRWQCB

Chris Foe, CVRWQCB

Michelle Wood, CVRWQCB

Steve Butkus, No. Coast RWQCB

Robert Brodberg, OEHHA

Andrea Ventura, Clean Water Action

Don Coates, No. Coast RWQCB

Sandra Lunceford, Techlaw

#### Via Teleconference

Alyce Ujihara, Cal. Dept. Public Health

## **I. Introductions and Agenda Review**

4 new participants: Shaw guy, Bill, Andrea, Steve

## **II. Project Updates**

- Calfed Fish Mercury Project: winding down, finishing reports, published advisory and very “visual” brochures for No. Delta. Materials are available on the web site (<http://www.sfei.org/cmr/fishmercury/>). Didn't find any additional funding opportunities. Community participants generally desired broader use (not just Hg). SWAMP fish screening study is separate but connecting with other existing programs (SF Bay RMP, SCCWRP).
- Calfed Hg studies in Yolo Bypass: there are 3 separate mercury studies going on now: BMP development, rice study, and wetland methylation

- USGS studies in Bear/Yuba: No one was on hand to share
- Sierra Fund toxic mine cleanups: Received funding from the California Endowment to continue advocacy work
- BLM mine site clean ups: two mercury mines are slated for remediation, one in the Putah Creek watershed and one in the Bear Creek watershed (tributary to Cache Creek).
- State Board policy (offsets, MeHg criteria): No progress. Rick Rasmussen indicated progress may come in early 2009
- AML Forum: rescheduled the next meeting for November, due to the state budget impasse
- Delta Mercury TMDL: No progress. Trying to contract a CSUS facilitator for a collaborative stakeholder process, but on hold due to budget
- The new 303(d) list will be presented to the RWQCB in December; to SWRCB in 2009

### III. Presentations

#### **“Fish Consumption Findings” by Fraser Shilling (UC Davis)**

Dr. Shilling and his team of graduate students and health clinic workers researched subsistence fishing communities in the Delta. “Subsistence” means “what we live on”; more specifically for this context it means eating 32-142 g fish/day. The team surveyed over the period 9/05-7/08, interviewing 373 anglers and 140 community members. Looked for weekday, shoreline anglers (most likely subsistence basis).

Most anglers preferred striped bass and catfish, although many will eat whatever they catch. Half ate more than 32 g/day, 5% above 10x reference dose used to set the criterion. A few who ate high quantities of trout had low mercury doses because of lower trout body burdens of mercury.

The draft Delta mercury TMDL has a methylmercury target of 0.05 mg/kg for a fish consumption rate of 142 g/day. Because the 95<sup>th</sup> percentile fish consumption rates for many groups are near or higher than this rate, this target may be the most reasonable and defensible to protect human health.

Next steps in this research would be to: (1) continue survey in Delta with important additions/changes to improve accuracy, (2) continue collaboration with community organizations on surveying and policy development, and (3) use these data to develop a “balance model” for fish consumption from multiple sources.

For more information, contact Fraser Shilling at (530) 752-7859, fmshilling@ucdavis.edu.

#### **“Harley Gulch Biological Sampling 2007-2008” by Roger Hothem (USGS)**

Mr. Hothem presented new, preliminary results of biota monitoring in Harley Gulch, which is just downstream of the large Abbott-Turkey Run mine complex. The purpose of this study is to measure mercury bioaccumulation in frogs and invertebrates and to evaluate effects of the Abbott-Turkey Run mine site restoration. Amphibians are good bioindicators because they are less mobile, have a varied diet, and are consumed by several important predators. Very little data on this higher trophic level compared to water, sediment, and fish.

In 2007 (6 sites) and 2008 (13 sites) invertebrates (especially adult water striders, and larval dragonflies and damselflies) and foothill yellow-legged frogs were sampled at sites in Harley Gulch, from Highway 20 near the mine site to the gulch's confluence with Cache Creek. In 2008, the highest concentrations in invertebrates from the wetlands area were near the culvert just downstream of Highway 20. In 2008, sites 5 and 7 (200 and 600 m downstream, respectively, of the confluence of west and east forks of Harley Gulch) had the most elevated concentrations of methylmercury in dragonfly larvae and water striders.

Before mine restoration (1997-2007), mercury concentrations in Harley Gulch biota far exceeded references. After mine restoration (2008), there appears to be a trend to declining mercury in both amphibians and invertebrates.

These results will help managers plan for future activities to minimize mercury impacts on biota within Harley Gulch and Cache Creek; however, another year of data—preferably in a different type of water year—is needed to confirm declining mercury contamination at Harley Gulch.

For more information, contact Roger Hothem at (707) 678-0682, roger\_hothem@usgs.gov.

### **“Mercury TMDLs in the North Coast” by Don Coates and Steve Butkus (Reg.1 Board)**

Dr. Coates and Mr. Butkus described the sampling and analyses they are doing to develop mercury TMDLs for Lakes Pillsbury, Mendocino, and Sonoma in the North Coast region. OEHHA advisories and the TMDLs will focus on human health protection.

Sampling includes:

- Water within reservoirs, inflows, and outflows sampled for total-Hg and methyl-Hg
- Sediment in dated cores from bottom of each reservoir will be sampled for total-Hg
- Fine sediment in streams (inflows and upland tributaries) sampled for total-Hg
- Upland watershed soils sampled for total-Hg
- Mercury mine and prospect workings sampled for total-Hg

Analyses and measurements have included:

- Total-Hg and methyl-Hg from near surface and near bottom at two to four water column stations per reservoir
- Total-Hg and methyl-Hg from major reservoir inflows and outflows
- Temperature, DO, and pH profiles at each water sampling station in the reservoirs
- TSS and total-Hg from major reservoir inflows and outflows during and following storm events

Total mercury concentrations in inflow grab samples do not correlate well with concurrent TSS grab samples ( $R^2 = 0.013$ ). Consequently, easily-measured TSS can not be used reliably as a surrogate for mercury levels or for identifying hot spots.

Plans for continuing to develop the TMDL call for the following activities:

- Estimate the rate of mercury retention over time in each reservoir. If Hg is found to be stable or increasing over time, then the main source is from the watershed and additional

sediment reduction efforts are needed. If Hg is found to be decreasing over time, then the problem is a legacy issue and passive restoration (do nothing) may be appropriate.

- Identify local sources by sampling fine sediments in streams, upland soils, and historic mining areas
- Evaluate the contribution of aerial deposition of Hg to the reservoirs' watersheds
- Estimate a total mercury mass balance
- Conduct a linkage analysis based on total mercury in water using the California Toxics Rule criterion and in fish tissue using the USEPA criterion

One participant argued that the default CTR criterion being applied is meaningless and therefore a linkage analysis between total mercury in water and methylmercury in fish is not defensible.

For more information, contact Don Coates at 707-566-3882, [dcoates@waterboards.ca.gov](mailto:dcoates@waterboards.ca.gov) or Steve Butkus at 707-676-2834, [sbutkus@waterboards.ca.gov](mailto:sbutkus@waterboards.ca.gov).

### **“San Joaquin River Watershed Issues” by Chris Foe (CV Regional Board)**

Dr. Foe presented work funded by CALFED and state TMDL funds. This work was part of an initial effort for a Central Valley TMDL. The study area was the San Joaquin River watershed, essentially the entire drainage basin to the Delta from the South. The majority of sampling stations were either on the San Joaquin River between Fremont Ford and Vernalis or at the mouths of tributaries to that reach. Samples were collected approximately monthly from May 2003 through July 2006, providing ~34 samples at 12 stations.

Along the mainstem, methylmercury concentrations decrease moving downstream. The main reason appears to be dilution rather than demethylation. MeHg appears to be transported conservatively in the flowing section of the San Joaquin. A similar pattern is observed in the Sacramento River.

Major eastside rivers with gold mining (Merced, Tuolumne and Stanislaus) provide 75% of water to Vernalis, but <50% of MeHg load. Mud Slough and Salt Slough are opposite: 9% of water but 24% of MeHg load. Mud and Salt Sloughs have one of largest remaining wetland areas in California. New Idria mercury mine, the second largest mercury mine in California drains through Salt Slough. However, MeHg concentrations tend to exhibit extremely high seasonal peaks in September in Mud Slough, when water is supplied to ~300 wetland cells. Seasonal wetlands spike soon after flooding and again (sometimes) later. Permanently flooded wetlands show no seasonal patterns. Methyl mercury levels in Salt Slough are much lower than in Mud Slough and show no seasonal pattern.

Detailed MHg mass balance studies are underway in Mud Slough. The drainage has about 30,000 acres of seasonal and permanent wetlands. MHg concentrations increase in seasonal wetlands after fall flood up but decrease to baseline conditions after about 2 months. Concentrations may rise again in March during spring drawdown. Seasonal wetlands are always a net source of MHg. In contrast, no seasonal MHg patterns exist in permanent wetlands. Some permanent wetlands are sources and others sinks for MHg.

At Vernalis in 2005-2006, mercury levels in silverside (small biosentinel fish) tracked methylmercury levels in water, both increasing 6-fold during an emergency release period and returning to baseline levels later.

A peer-reviewed report will be released soon. The CALFED web site is moving soon from Texas A&M to Moss Landing.

For more information, contact Chris Foe at (916) 464-4713, cfoe@waterboards.ca.gov.

#### **IV. Discussion Items**

Chuck Lungren's presentation of the SRWP web site was postponed for the next meeting.

#### **V. SRWP Update**

Watershed Health Indicators Program "report card" is underway. Technical advisory committee has been formed.

Roadmap project "atlas" of Sacramento River Watershed is underway.

Annual fundraiser dinner is Oct. 2. Great speakers are on the agenda, so plan to attend!

#### **VI. Other Updates**

- Stephen McCord showed copies of two recent journal issues focused on mercury papers presented at the Madison mercury conference in 2006. Both were provided by Jim Weiner.
- The San Francisco Bay RMP annual meeting in Oakland on October 7 has the subtitle "MERCURY: Water Quality Enemy Number One".
- The CALFED Science Conference on October 22-24 has several mercury presentations.
- Ivan Sterman provided information on potential for Hg removal in Bay (gold-related) by suction dredge.

#### **VII. Meeting Wrap-Up**

Tentatively set for Tuesday, December 2, 2008 at the offices of Larry Walker Associates in Davis.

Future agenda items could include:

- BLM mine remediation projects
- Sierra Fund mine remediation efforts
- Sutter Buttes project by Teichert
- Mercury in runoff from a contaminated site on the UC Davis campus
- Summary of CALFED-funded studies in the Yolo Bypass
- Recap of CALFED Science Conference presentations on mercury