RMP Technical Review Committee Meeting
October 3rd, 2006
San Francisco Estuary Institute
Meeting Minutes

Attendees: Brian Anderson (UC-Davis)
Mike Connor (SFEI)
Jay Davis (SFEI)
Bridgette DeShields (BBL/WPSA)
Ben Greenfield (SFEI)
Andy Gunther (AMS)
Tom Hall (South Bay Dischargers (EOA))
Sarah Lowe (SFEI)
Lester McKee (SFEI)
John Prall (Port of Oakland)
Chris Sommers (Stormwater Agencies (EOA))
Karen Taberski (RWQCB)
Bruce Thompson (SFEI)
Saskia van Bergen (EBMUD)

1. Introductions and Approval of Agenda and Minutes

Dave Tucker was unable to make the day's meeting. Karen Taberski served as the alternate chair; however, as a result of unforeseen circumstances, Ms. Taberski arrived 30 minutes late. Ms. DeShields served as interim chair until she arrived. Ms. Sedlak gave a brief update on the action items from June TRC meeting.

The development of a five-year plan for the RMP and a meeting of the workgroups with the TRC have been deferred until after the redesign of the Status and Trends (S&T) program is completed. Based on discussions with Richard Looker, the power analysis was conducted using a one-tailed statistical analysis. Mike Connor held meetings with several of the dredgers and there is a strong interest in maintaining the USGS Alcatraz site as one of the six USGS sites where suspended sediment concentrations are measured. Bruce Thompson has contacted DWR to set up a meeting for discussing coordinating benthic sampling.

Ms. DeShields motioned to approve the minutes, and Ms. van Bergen seconded.

Action item: Include action items from the October 2006 meeting into the action items previously developed.

2. Information: January Steering Committee Report

Meg Sedlak provided a brief summary of the Steering Committee (SC) meeting on July 17, 2006. Ms. Sedlak indicated that the bulk of the discussion at the SC meeting had focused on the 2007 Pilot Studies and Special Studies (PS/SS). The following four studies were approved by the SC: a second small tributary loading study ($154,000); two studies on emerging contaminants (pharmaceuticals in wastewater effluent and the Bay, and a study on perfluorinated compounds in seal blood - $60,200); a review of remote sensing photography to determine loads into and out of the Bay ($8,000); and a study of organic and inorganics in small fish ($58,000).

Ms. Sedlak stated that the budget was general on track although a significant portion of the labor for data management tasks has been expended as a result of processing two years of data (2004 and 2005) in one year. Direct costs were 30 percent expended; however, a significant portion of direct costs are associated with the Annual Meeting.

3. Information: Summary of Outcomes of the September 19th Status and Trends Redesign Meeting

One of several meetings regarding the redesign of the Status and Trends project was held on September 19th. The meeting began with a general discussion of the objectives and the management questions which guide the RMP. As a tool for evaluating the Program, Jay Davis prepared a summary sheet of the management questions and how different elements of the RMP address each one. The summary sheet suggested that the Status and Trends program is focused on answering Objectives 1 (distribution of contaminants), Objective 2 (forecasting future loads) and Objective 5 (comparing to guidelines). Objectives 3 (sources pathways and loadings) and 4 (exposure and effects) are generally not being addressed in Status and Trends monitoring, but are being addressed through the PS/SSs. It was noted that the results of the interactive poster survey on priorities of the Program from the Annual Meeting rated Objectives 3 and 4 the highest.

There was a short discussion on how funding of the Status and Trends program might change to better address the management questions. It could increase with an increase in the overall funding of the RMP; it could decrease if the PS/SS funding was increased; or it could increase if some of the existing PS/SSs were transferred into Status and Trends at their current funding level.

The day's goals were to review the existing Program elements (e.g., water chemistry, sediment chemistry, bivalves, sediment toxicity, episodic toxicity, and sportfish monitoring). New elements would be addressed at the next redesign meeting. For each element, a brief synopsis of the regulatory context, the important concepts, recent highlights, and potential design options were presented. Ms. Sedlak indicated that the potential design options were based in

part on the power analyses. To illustrate how the process worked, Ms. Sedlak briefly reviewed the water chemistry element. The minutes from the redesign meeting were included as part of the agenda package.

Ms. DeShields asked whether the redesign would be implemented in 2007; Jay indicated that it would generally be implemented in 2008, but some changes that could be adopted in the near-term might be implemented in 2007

Chris Sommers requested that an agenda item for the next TRC meeting include a discussion of SWAMP monitoring and data management so that the group could see how the RMP would coordinate with that program.

The next redesign workshop was scheduled for November 15.

Action item: Include a discussion of SWAMP for the next TRC meeting.

4. Information: Episodic Toxicity 2007

Sarah Lowe summarized the information that this element has generated to date and the impetus for pursuing episodic toxicity. She highlighted that with a change in the type of pesticides that are used (organophosphate pesticides to pyrethroids), there has been a change in toxicity. Aquatic toxicity in the tributaries decreased over time (1996 to 2001) whereas there is a paucity of information about sediment toxicity in local tributaries. Our understanding of these chemicals: OP pesticides tend to partition into water whereas pyrethroids tend to partition into particles make it warranted to investigate the potential for sediment toxicity in local tributaries.

She also summarized historical findings of the RMP Status and Trends Program, noting that bivalve toxicity tests in the Estuary showed consistent toxicity throughout the year (no effect of seasons) whereas amphipods have a higher mortality in the winter (e.g., 30 percent toxicity in summer vs 50 percent toxicity in winter). Limited TIE testing that has been conducted in Grizzly Bay (in the late nineties by UC-Davis) suggests that copper is responsible for the toxicity to bivalves in that region. TIE conducted in other areas of the Estuary seem to suggest divalent cations (metals) as responsible for the toxicity.

The toxicity workgroup recommended (in 2004) that future toxicity sampling be undertaken in the winter; examine sediment; determine the causes of persistent toxicity; and use an estuarine species. The episodic toxicity program in conjunction with outside funding from the PRISM program has begun to address the workgroup recommendations.

Chris Sommers asked whether Brian Anderson had developed TIE methods for pyrethroids. Brian Anderson confirmed that his group had.

Chris Sommers indicated as part of BASMAA's stormwater permit (the "Municipal Regional Permit"), he anticipates that BASMAA will be sampling 10 freshwater sites per year over a five-year period, with two sampling events per year, for both 1) sediment toxicity and sediment chemistry (at the beginning and end of each wet season) and 2) water toxicity and diazinon (during one storm and once during the dry season). The sediment triad is the core of the proposed BASMAA program.

Karen Taberski commented on how difficult it is to sample for toxicity. As part of the SWAMP program, the Regional Board sampled Petaluma River for sediment and water toxicity. Dr. Don Weston of UC-Berkeley reviewed the data and commented that few samples were collected in fine-grain sediments. Brian Anderson noted that pyrethroids tend to adsorb to carbon and that it was difficult to collect a sample that was representative of the stream or bay channel. However the recent PRISM study conducted in six tributaries by SFEI samples with an average percent fines of 57.

Jay Davis commented that the winter sampling of the sediment triad (toxicity, chemistry, benthos) in the RMP Status and Trends Program (not part of this Episodic Toxicity 2007 proposal) could be done in two different ways: it could continue to use a randomized design to characterize toxicity that would be representative of the Bay or it could employ a targeted design with a focus on hot spots (near sources on the margins of the Estuary) to better understand what is causing the toxicity.

Brian Anderson indicated that it is easier to determine what is causing the toxicity when there is a larger signal. It has been difficult to determine the cause of toxicity with the summer samples because the magnitude of toxicity is not sufficient to conduct additional testing.

Mike Connor stated that the program was trying to answer two different questions: what is the biological significance of the toxicity that we are observing in the Estuary versus what is causing the persistent toxicity that we are observing. Brian Anderson advocated focusing on amphipods as it is easier to establish linkages to ecological impacts. He also stated that this begins to address the Sediment Quality Objectives (SQOs) that were developed using amphipod toxicity tests. Once a toxic hit is identified, then the stressor (or cause of toxicity) is required to be identified. Brian also thought it was important to continue the long-term Status and Trends Monitoring Program's summer toxicity element to track longer trends.

Sarah proposed that the episodic toxicity program 2007-2008 be initiated in two phases:

- In first quarter of 2007, the program would identify a suitable location. Reconnaissance screening of four tributaries would be conducted. Possible sites include: Hunter's Point, San Mateo Creek, Redwood Creek, and Kirker Creek. Resampling would occur at the two most toxic sites.
    - Toxicity would be evaluated at all four sites
    - Sediment chemistry would be evaluated in up to four samples (at the most toxic stations)
    - TIE funding (up to three TIEs) would be set aside in case there was significant enough toxicity to warrant a TIE work-up.
    - The cost for this first part would be approximately $65,000.

- In the third quarter of the 2007 and possibly into 2008, a gradient study would be conducted at the most toxic site identified during the screening. The goals of the gradient work would be to 1) identify the pollutants causing amphipod toxicity (the primary goal); 2) determine the extent of ecological impact in the Estuary; and 3) a third goal, especially for the related EEPS benthic work that would examine the same gradient, would be developing tools for monitoring sediment quality.
    - Sediment toxicity, sediment chemistry, and benthos would be monitored.
    - TIEs would also be conducted.
    - The cost for this would be $108,000.

The eventual goal of this study (2009 +) would be to relate TIE results to in-situ effects, which means that benthic community analyses and other triad measures would become integrated into this study (but is not part of this proposal at this time: this effort would relate the EEPS benthic work (lead by Bruce Thompson) that has been previously approved by the TRC).

It was recommended that the group review Don Weston's work in identifying creeks to include in the screening survey.

Although the goal of this proposal is to develop TIEs for estuarine sediments and test species, and does not necessarily require a contamination gradient for implementation, the fact that the TRC presentation touched on a lot of related topics, resulted in a discussion about the difficulties of identifying a contamination gradient in the margins of the Estuary. Andy Gunther, Karen Taberski, and Chris Sommers all indicated that they had overseen large scale studies costing several hundred of thousands of dollars in which an attempt to identify gradients had been conducted with little success. Andy commented on how heterogeneous sediment is and that frequently the highest chemical concentration is observed adjacent to one with the lowest. Dr. Gunther noted that the sites tended to distribute themselves bimodally; they were either extremely toxic or not toxic. There was very little middle ground.

Brian Anderson commented on how much our understanding of benthic assemblages has evolved. Andy Gunther commented that it would be difficult to get at the ecological significance. Sarah Lowe emphasized the need to link the toxicity to a benthic impact. Ben Greenfield suggested that the program might try to do a paired comparison between impacted sites and non-impacted sites.

Lester McKee commented that in following the toxicity, understanding its origins, and tracking it in the Estuary it is important to have an understanding of the watershed processes that are causing the toxicity (e.g., runoff events, sediment processes, etc.).

Mike Connor asked the group whether they endorsed the idea that the episodic toxicity program was emphasizing (i.e., determining the cause of the sediment toxicity). The group agreed that they did. Mike then recommended that Sarah Lowe, Brian Anderson, Bruce Thompson, Lester McKee and others convene a workgroup to decide how the program would best answer the questions of what is causing the sediment toxicity and whether a gradient study can be designed to link toxicity to benthic impacts in the Estuary.

Mike Connor stated that the episodic toxicity work would need to be coordinated with the BASMAA stormwater permit and the work the Water Board was conducting in urban creeks. It was also important to understand the mixing depth and how the sediment toxicity work of the RMP compared to the sediment toxicity work that the US Army Corps of Engineers is conducting. A summary diagram included as part of Sarah Lowe's presentation should be modified to include non-RMP elements such as the MRP, SWAMP, and ACE toxicity testing.

Bruce Thompson gave a brief summary of the benthos project that will be conducted as part of the Exposure and Effects Pilot Study. Using the SQO database, Aroon Melwani and Bruce are locating chemical gradients and gradients in benthic community composition at several sites including San Leandro Bay, Hunter’s Point, and Richmond Harbor. This is a desktop corelational study that should be completed by the end of the year. A draft report on this analysis will be completed in February. The study is part of a three-year study; sampling will occur in 2007 and 2008. This study would be back on the TRC agenda in March after the report is completed.

Chris Sommers noted that causality cannot be determined from this study and asked how Bruce would handle changing variables such as salinity, grain size, and TOC. Chris also asked whether the benthic community indicator would be responsive to legacy pollutants. Brian Anderson responded that the benthic communities are an indicator of chronic impacts, which the amphipod toxicity tests are indicators of acute impacts.

Action: Sarah Lowe to convene a workgroup to refine the episodic toxicity program and to report back to the TRC at the December meeting. Bruce Thompson to present results of EEPS benthos project at the December TRC meeting. Don Weston's work should be used in identifying creeks to include in the screening survey. A summary diagram included as part of Sarah Lowe's presentation should be modified to include non-RMP elements such as the MRP, SWAMP, and ACE toxicity testing.

5 & 6. Discussion of Program Plan and Allocation of $20,000 of Pilot Studies and Special Studies Funding

Meg Sedlak outlined the Program elements for 2007 from the 10-year Program Budget and requested approval of the budget. Karen Taberski suggested that as a procedural issue, the decision regarding the allocation of the remaining $20,000 should be made first and then the Program Plan for 2007 approved.

Meg Sedlak passed out a list of PS/SS proposed for 2007 and stated that based on the e-mail responses that it appeared the TRC was interested in funding either the Mercury Deposition Network study (MDN) or the Food Web Model study or placing the funds into the contingency funds.

Karen Taberski stated that for the RWQCB the MDN study was less of a priority than the food web study. Several individuals requested a brief synopsis of the food web study; Ben Greenfield indicated that it was a coupling of the multi-box model and the food web model developed by Gobas and Arnot. Ben noted that based on the small fish project, substantial variation in methyl mercury in the fish had been observed. Part of the variation may be due to habitat (benthic vs. pelagic) or to dietary intake. The food web study would begin to address these types of questions through a better understanding of food web dynamics, dietary intakes of fish, and fate and transport of contaminants. Chris Sommers expressed some concern that the multi-box model did not have sufficient resolution to be linked to small fish monitoring on small spatial scales.

The TRC recommended that Ben meet with Chris Sommers, John Oram, and Richard Looker to discuss whether the multi-box model could be used in this capacity. Ben Greenfield agreed to report back to the TRC at the December meeting.

Chris Sommers motioned for approval of the 2007 Program Plan; Karen Taberski seconded the motion and the Program Plan was approved unanimously.

Action: Ben Greenfield to schedule meeting with RWQCB staff and SFEI staff to discuss linkage of the food web model and the multi-box model. Ben to present outcome of the meeting at the December TRC meeting.

7. Long-term Plan for Guadalupe River

Lester McKee passed out a handout on a proposal outlining a long-term strategy for tracking pollutant loads from the Guadalupe River. The strategy relies on tapping into the RMP contingency fund to monitor high flow events. Lester would request RMP contingency funds if rainfall in the Guadalupe River watershed (measured at the Almaden rain gauge) exceeded 1.8 inches in less than six hours. Lester indicated that the Guadalupe River had not been characterized during high rainfall events; as shown this year at Mallard Island (confluence of the San Joaquin/Sacramento Rivers) considerable contaminant loads are associated with large runoff events. These results would not be predicted based on the contaminant loads associated with smaller runoff events. As part of this proposal, the Santa Clara Valley Water District will contribute approximately $35,000. Lester McKee was requesting funding for $27,000 ($15,000 in labor and $12,000 in analytical costs) from the RMP contingency fund.

Another part of the long-term plan for Guadalupe is to perform another full round of wet season sampling in 2011. This item was included in the RMP 10 year plan discussed in item 5.

The TRC supported this idea and authorized the use of contingency funds should a rainfall event of this magnitude occur. Lester McKee indicated that he would notify the TRC to the best of his abilities in advance requesting confirmation of approval.

8. Information: Annual Meeting

Meg Sedlak reviewed a memorandum summarizing the Annual Meeting. The attendance was the same as last year, 191 attendees; however, only 10 percent of the surveys were returned as compared to last year's 20 percent. Ms. Sedlak summarized the comments and reviews. Several Committee members recommended using an electronic survey supplied by an outside vendor such as Zoomerang to query the group and to compile the results. A combination of this with surveys completed at the meeting to review the presentations while they were fresh in people's minds was recommended.

Several individuals commented that Mike Connor had done a great job of soliciting input from the participants and that there had been a nice balance between science and policy. The overall comment was that the Annual Meeting was well done and that it should continue to be held at the Oakland Museum due to its central location, proximity to BART, and courtyard for lunch.

Mike Connor asked the group for comments on the Pulse. Karen Taberski stated that the one minor comment she had received was that perhaps the Pulse wasn't that environmentally-friendly (e.g., glossy paper, oil-based inks?). Jay Davis commented that he thought it was printed on recycled paper with soy-based ink

and that he would confirm this, and would look into whether next year's Pulse could be more environmentally friendly. Andy Gunther suggested that it would be valuable to make the Pulse article available on the website individually.

The TRC then discussed possible topics for the Pulse. Jay Davis suggested that each of the participant sectors write a story on actions taken over the long-term by their sector to improve Bay water quality. BACWA has already agreed to write an article about the substantial reduction in metal loadings over time. The dredgers could write a piece on the reduction of in-Bay disposal (i.e., implementation of LTMS). BASMAA could do a story on number of streets swept or tons of material collected. BACWA could also discuss program such as the pharmaceutical take-back or elimination of triclosan, an anti-bactericide. Other topics could include: the impact of shoreline cleanups; trends in trash and BMPs (Chris Sommers and Karen Taberski had sources of information on this); sanitary sewer overflows and achievement of swimmable status for beaches around the Bay; copper and the success of the copper brake pad initiative. An article combining information on Lake Merritt and a Bay-wide review was suggested. A copper article could include information summarizing events over the past 6 years, the SSOs soon to be adopted, and the brakepad work which has included extensive modeling linking atmospheric deposition and transport to the Bay through the watersheds.

Action: Jay Davis to determine whether the Pulse is published in an ecologically-sensitive manner (e.g., soy-based inks, recycled paper, etc.). Make the Pulse articles available on the website individually.

9. Information: Update on Sediment Coring Project

Don Yee gave an update on the joint CEP/RMP coring project. The goals of the coring project are to better understand future contaminant loads, characterize contaminant profiles with depth, and provide better data for modeling. Seventeen cores will be collected. Eleven sites within the Bay have been sampled; the remaining six sites in the wetlands will be sampled in October after clapper rail breeding season. The sites within the Bay are distributed evenly with 3 sites in central Bay and two in the remaining segments. The cores are being collected with vibracores (some compaction occurs) and manual push covers (relatively little compaction occurs).

Three cores were collected in May; however, there were logistical problems so the sampling was put on hold (e.g., captain became ill). The remaining cores were collected in July. The wetland cores will likely be collected by Beth Watson of UC-Berkeley as the university is one of the few institutions with a Livingston corer needed for sampling wetlands.

The initial radiodating suggests that the thorium concentrations are below detection. The thorium concentrations remain constant with depth (30 cm max.).

Thorium has a half-live of approximately 24 days. Lead 210 remains constant in the upper 10 to 20 cm, after 20 cm it drops off with a constant decay function. Cesium 137 has a maximum near the surface. This suggests that the surface remains static or that the surface has eroded.

Action: The Contaminant Fate Workgroup to develop a five-year plan at the CFWG meeting on October 30th.

9. Information on South Bay Atmospheric Mercury Monitoring

Don Yee presented the results of the USEPA mobile laboratory monitoring which occurred at the Moffett Field site (NASA Ames) part of the MDN site and at Calero Reservoir. The purpose of the monitoring was to determine whether there were local sources of mercury that could be identified. The USEPA lab measures particulate, reactive, and elemental mercury. The average total dry mercury concentrations were consistent with previous RMP studies, on the order of 2.0 ng/m3. The wet deposition at the MDN site was on the order of 10 ng/L; Tom Hall commented that this concentration was higher than the effluent from the City of San Jose's wastewater treatment plant (about 2 ng/L).

Don noted that there was a diel cycle with regard to the particulate and reactive fractions and that the particulate fraction was approximately 100 times lower than the total concentration. Don Yee also noted that at the Calero site, the mercury concentrations were always higher when the wind was blowing from the west (the direction of the Almaden mine).

10. Information: Program Update

Meg Sedlak briefly summarized key highlights from the workgroup summary that was included in the TRC package. Ms. Sedlak also passed out Scorecard; the major accomplishments this quarter were preparation of the Pulse and Annual Meeting. Lester McKee gave a brief update on the small tributary study. Dr. McKee indicated that he had received authorization to conduct sampling at an industrial location in Hayward (Zone 4A). Sampling at this site will assist us in understanding the loadings from industrial areas with low rainfall.

The next TRC meeting will be on December 19th. The meeting was adjourned at 3:00 pm.

ACTION ITEMS

ACTION	WHO	STATUS
Develop a Five-Year Plan for the RMP that addresses management objectives and questions	Jay Davis	To be conducted after preparation of all workgroup five-year plans.
Convene a meeting of the workgroups with TRC to discuss long-term plans	Meg Sedlak/Jay Davis	To be conducted after completion of a five-year plan for RMP
Present SWAMP monitoring and data management goals at next TRC meeting	Rainer Hoenicke	To present at December TRC meeting
Convene a workgroup to refine the episodic toxicity program and to report back to the TRC at the December meeting. Present results of EEPS benthos project at the December TRC meeting.	Sarah Lowe/Bruce Thompson	Workgroup meeting to discuss episodic toxicity was convened. A revised workplan will be presented at TRC meeting in December. EEPS panel recommended that benthos be incorporated into S&T; no need for further pilot study development. Bruce to present a benthos plan at December meeting.
Schedule meeting with RWQCB staff and SFEI staff to discuss food web model and multi-box model. Present findings of the meeting at the December TRC meeting.	Ben Greenfield	Ben Greenfield has revised his proposal based on extensive discussions with BASMAA, RWQCB and SFEI staff. Will be presented at Dec. TRC meeting.
Determine whether the Pulse is published in an ecologically-sensitive manner	Jay Davis	
Contaminant Fate Workgroup to develop a five-year plan to be presented at the CFWG meeting on October 30th.	John Oram	CFWG will address this at its next meeting in the Spring 2007.
Coordinate DWR benthic assessments with the RMP sediment chemistry sites	Bruce Thompson/Sarah Lowe	DWR has been contacted to set up a date for the meeting. Bruce will summarize the DWR discussion at the Dec TRC.