



SAN FRANCISCO ESTUARY INSTITUTE

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Bay RMP Technical Review Committee Meeting

March 29, 2016

San Francisco Estuary Institute

Meeting Summary

Attendees

TRC Member	Affiliation	Representing	Present
Nirmela Arsem	EBMUD	POTWs	No
Rod Miller	SFPUC	POTWs	Yes
Tom Hall	EOA, Inc.	South Bay Dischargers	Yes (By Phone)
Amy Chastain	City and County of San Francisco	CCSF	No
Eric Dunlavey	City of San Jose	City of San Jose	Yes
Bridgette DeShields*	Integral Consulting	Refineries	Yes
VACANT		Industry	NA
VACANT		Cooling Water	NA
Chris Sommers	BASMAA (EOA, Inc.)	Stormwater	No
John Prall	Port of Oakland	Dredgers	No
Ian Wren	San Francisco Baykeeper	NGOs	Yes
Rob Lawrence	US Army Corps of Engineers	USACE	No
Karen Taberski	SFB RWQCB	Water Board	Yes
Luisa Valiela	US EPA	US-EPA IX	Yes

*Chair

Others Present

- Phil Trowbridge (SFEI)
- Jay Davis (SFEI)
- Jennifer Sun (SFEI)
- Don Yee (SFEI)
- Lester McKee (SFEI)
- Naomi Feger (SFBRWQCB) (by phone)
- Richard Looker (SFBRWQCB)
- Bonnie DeBerry (EOA)
- Samantha Engelage (City of Palo Alto)

1. Introductions and Review Agenda

Ian Wren noted that the length of the deliverables and action items sheets made them difficult to review. However, the group as a whole preferred to include all workplan items, and agreed to have SFEI continue providing these sheets as done currently.

2. Decision: Confirm TRC Chair for 2017

TRC chairs can serve one-year terms indefinitely with the support of TRC members, according to the RMP Charter. Bridgette DeShields was thanked for serving as TRC chair in 2016 and agreed to serve again in 2017. None were opposed.

3. Decision: Approve Meeting Summary from December 15, 2016

There were no comments. Karen Taberski made a motion to approve the meeting summary, and Eric Dunlavy seconded the motion.

Action Item

- Post December 15, 2016 meeting summary to the Bay RMP website (Jennifer Sun)

4. Information: Steering Committee Meeting from January 19, 2016

Phil Trowbridge presented key topics discussed at the previous Steering Committee held in January:

El Nino Monitoring

SFEP is providing \$255k to fund the three El Nino monitoring studies, reducing the RMP cost to \$43k if all three studies are completed. USGS sediment flux monitoring at the Golden Gate Bridge has already begun, and monitoring at the Dumbarton Bridge was scheduled to begin the week after the TRC meeting. The monitoring triggers for Guadalupe River mercury monitoring were not yet reached at the time of the meeting, and monitoring is not scheduled to occur.

The South Bay spring bloom characterization study by the Nutrients group will begin intense sampling in April. This \$31k in funding had already been allocated for Nutrients Studies in the 2016 budget.

RMP Program Review

The RMP considers conducting a program review about every five years, although a full external program review has not occurred since 2003. In response to a request from the Steering Committee, the RMP is conducting an “internal” (staff level) program review and will provide a report back to the Steering Committee in April.

Currently, the only performance metrics used are related to data management efficiency (i.e., time required for data sets to be received from the laboratory, quality assured, formatted, etc.). Most performance measures considered were deemed unnecessary; however, staff think that an annual survey of program participants could be useful. This idea will be discussed with the SC.

New RMP Funding Streams

The RMP has been approved as a Supplemental Environmental Project. Funds from mandatory minimum penalties (MMPs) can be pooled and used for various projects, but funds from large settlement fees must be tied to a specific project with an explicit nexus to the cause of the violation. \$25k in MMP funds are currently available; approximately \$100 - 150k in SEP funds are expected in 2017.

The Water Board has also approved Alternative Monitoring Requirements for wastewater dischargers, allowing dischargers to pay additional funds into the RMP in exchange for reduced monitoring requirements for CTR parameters. While the Steering Committee retains the authority to allocate these funds, they are intended to be used for Emerging Contaminants monitoring. No funds have been collected yet; the total amount of funds that will become available for 2017 will not be known until November.

Workgroups will be directed to recommend special studies based on current Multi-Year Plan allocations, but to propose and prioritize additional studies that could be later be funded by these new funding sources. In particular, a short list of project proposals ready to be matched with SEP funds should be developed.

5. Information: Review Upcoming Workgroup Meetings and Planning Budgets for Special Studies

The 2016 RMP workgroup meetings have been scheduled for April and May. The 2016 Multi-Year Plan (MYP) lists the planning budgets and tentative list of 2017 proposals for each workgroup. The planning budgets add up to \$1,556k compared to \$1,073k of expected funds. Meeting dates and key highlights regarding the planned proposals and budgets for each workgroup are listed below:

- Emerging Contaminants Workgroup: April 15, 2016

- The ECWG will make recommendations for funding based on the \$214k funding allocation outlined in the 2016 MYP, and will prioritize unfunded studies for funding if new funds become available.
- Selenium Workgroup: May 4, 2016
 - The MYP tentatively lists two scientific studies - sturgeon muscle plug and egg mat monitoring - for funding in 2017. The egg mat study was initially proposed in 2016 and received mixed support, and will be reevaluated along with potential additional studies at this meeting. The group will aim to keep funding requests low.
- Sources, Pathways and Loadings Workgroup: May 11, 2016
- Exposure & Effects Workgroup: May 16, 2016 (meeting will be at the Water Board)
 - The PAH in flatfish study listed in the MYP will not be proposed because it would require a large data set and a higher level of funding than expected. Long-term plans for this workgroup will be discussed at the workgroup meeting. The bioanalytical tools study results will be presented at the Exposure & Effects Workgroup meeting, potentially leading to discussions about additional collaborative projects between the EEWG and ECWG.
- PCB/Dioxin Workgroups: May 6, 2016
 - The PCB and Dioxin workgroups share the same external advisor and will be held concurrently. No new proposal discussions are required for the Dioxin workgroup; the Dioxin synthesis proposal that was not funded in 2016 will simply be briefly revisited and proposed again in 2017.
 - The Emeryville Crescent conceptual model report will be presented at this meeting. The next set of proposals will focus on the San Leandro Bay PMU. SEP funding may be available for additional projects.
- Microplastics Workshop: June 29, 2016
 - The date of this meeting conflicts with the SWAMP Symposium.

6. Discussion: Review and Prioritize Ideas for Potential New Focus Areas for the RMP

Phil presented an outline of four potential new focus areas for the RMP: tidal wetlands regional monitoring, trash, beneficial reuse of dredged sediment, and suspended sediment monitoring. Feedback from the group on the merits, potential RMP role, and next steps for each of the focus areas are summarized below.

Tidal Wetlands Regional Monitoring

The group supported this focus area as a high priority. Phil suggested that this type of monitoring include ambient contaminant concentrations, inundation frequency and duration, and other special studies.

Additional suggestions for related studies included:

- dissolved oxygen monitoring in tidal and subtidal habitats, possibly through partnering with external researchers
- studying nutrient fluxes from wetlands
- monitoring related to climate change, sea level rise, and wetland restoration, including additional monitoring of biota

Tom Hall suggested that “RO concentrate disposal” be revised to “RO concentrate use” or “reuse”.

Beneficial Reuse of Dredged Sediment

The goal of this focus area would be to identify whether more dredged sediment can be made available for beneficial reuse, understand related water quality impacts, and identify where in-Bay disposal should occur to help nourish wetlands. Ian Wren indicated that there is increased interest in using modeling to identify such in-Bay disposal locations, and increased monitoring of in-Bay disposal.

Trash

Ian Wren expressed concern over involving the RMP in this highly political topic that is being addressed by many existing groups, but other group members suggested that independent scientific data from the RMP could help resolve political issues. Richard Looker suggested that studies could include modeling the movement of trash as it is delivered from tributaries and deposited at various locations in the Bay, which could help identify key locations for interventions. Regional shoreline trash monitoring could be informed and complemented by statewide trash tracking through Prop 84.

Suspended Sediment

The group agreed that suspended sediment monitoring was an important area for additional study, driven by the need to increase beneficial reuse for wetland management, and identify where in-Bay disposal should occur. Such modeling can also be tied to contaminant fate & transport and light availability for nutrient studies. Other data gaps include the need for separate North and South Bay sediment budgets, and the current lack of a sand budget. The RMP currently funds the USGS to do suspended sediment monitoring, but it may be appropriate consider an update to the existing monitoring design. RMP work in this focus area could support broader discussions about regional sediment management. Brenda Goeden at BCDC is preparing

a synthesis document based on a workshop held in October 2015, identifying data gaps and recommending priorities for sediment science in San Francisco Bay.

Bacteria

Multiple group members supported the evaluation of a fifth new focus area on bacteria, particularly as related to the new Beaches TMDL and MRP provision for identifying bacterial sources in one particular creek. Several group members felt there were limited data to support the new TMDL and additional molecular tools are needed to better understand the issue and conduct monitoring. Currently, the sources of fecal bacteria are undefined for a large portion of what is measured, and the defined portion may not be representative of the whole. Rod Miller indicated that SFPUC has been conducting studies comparing current *Enterococcus* monitoring methods to qPCR using natural and human molecular markers, and Bonnie indicated that similar studies were conducted in response to the MRP provision to identify creek bacteria sources. Initial results from these studies suggest that non-human sources account for a large proportion of the fecal bacterial measured.

The RMP can potentially play a role in furthering this method development work and informing future iterations of the TMDL. Entities defined in the TMDL could potentially be brought in as new RMP participants. The work is directly relevant to water quality at bathing beaches but would also inform beneficial use decisions for all recreational waters.

The group agreed that each of the potential new focus areas would need to be further discussed by the Steering Committee and smaller sub-groups to focus RMP roles and identify external partners. Revised recommendations will be further discussed and prioritized during the Multi-Year Planning meeting in November. Phil noted that margins sampling should be considered for addition to the Status and Trends monitoring schedule, as no further margins special studies projects are planned.

Action Items

- Convene the New Focus Areas subcommittee to further refine potential new focus areas to prepare for the Multi-Year Planning workshop in November (Phil Trowbridge)

7. Information: Preliminary Results from 2014 Sport Fish and 2015 CTR Water Status and Trends Monitoring

2015 Water Cruise CTR monitoring data

Don Yee presented preliminary results from the analysis of CTR (California Toxics Rule) analytes that was conducted during the 2015 Water Cruise. A subset of 77 CTR analytes that had

not previously been analyzed by the RMP in ambient Bay water were analyzed along with tributyltin.

All trace elements (Sb, Be, Cr, Th) were detected at all sites, but were at least 5x lower than criteria. Results for all VOCs and SVOCs at all stations were non-detect. With the exception of six analytes (N-nitrosodi-n-propylamine; acrylonitrile; 1,2-diphenylhydrazine; 3,3'-dichlorobenzidine; toxaphene; and benzidine) all method detection limits (MDLs) were below water quality criteria. Of the six analytes with MDLs above thresholds, most are of low concern or degrade quickly (ie. benzidine has a half life of one day), and all analyses met California target method limits where they exist. While it may be possible to work with the analytical laboratory to lower detection limits, it is unlikely that MDLs would be able to be lowered greater than 100-fold, as would be needed for toxaphene and benzidine MDLs to be reduced below thresholds. Don recommended that it would not be cost-effective to conduct further study or method development on these six analytes and the group concurred. The group recommended that Don talk with the Water Board regarding the potential policy implications for the six analytes with MDLs greater than criteria (e.g., How would the results be handled in a Reasonable Potential Analysis?).

The group recommended that the report include several appendix tables compiling all historical data collected for all CTR analytes (including those not monitored in 2015) at the three CTR stations since 1990s. Rows in the table will be CTR constituents, and columns will be measurement dates, with summary statistics calculated to the right of the table. The table will be large but all agreed that the table should show all the data as a starting point. However, data for samples collected more frequently at non-CTR stations would not be reported. Tom Hall requested that the report include hyperlinks to the 2002-2003 report on CTR monitoring.

At the time of the meeting, Don was waiting to hear back from Lila Tang regarding the methods used to calculate NPDES permit criteria using ambient Bay water results. Lila has since responded indicating that thresholds are set based only on data collected at the three CTR-specific RMP monitoring station, verifying that the recommended reporting format will provide adequate information. Discussions regarding the six analytes with “high” MDLs and useful summary statistics are ongoing.

2014 Sport Fish monitoring data

The seventh round of RMP sport fish monitoring occurred in 2014. Fish were collected from all segments of the Bay between April and August 2014, including at locations in the Carquinez Strait and Suisun Bay, where samples have not regularly been collected in the past; however, drought conditions in 2014 resulted in more saline conditions in these regions and allowed for some limited collection of target sport fish. Several additional fish - largemouth bass, striped

bass, and carp - were collected in August 2015 from Artesian Slough, at the outfall of the San Jose-Santa Clara Regional Wastewater Facility. Eric Dunlavey explained that largemouth bass stay in Coyote Creek, while striped bass found in the Slough can move throughout Lower South Bay but can also move into freshwater sections of the Slough.

The core parameters analyzed included mercury, PCBs, dioxins, selenium, PBDEs, and PFCs. Preliminary results were presented and presentation slides provided (see attachment). Future data analyses will include the analysis of organic contaminants on a lipid weight basis, as well as spatial analysis and striped bass length standardization with and without Artesian Slough. Feedback from the group is summarized below.

Mercury

Preliminary results showed exceedances of the TMDL and OEHHA no consumption thresholds, and no significant long-term trend in striped bass or shiner surfperch. Mercury concentrations in Artesian Slough largemouth bass were below the statewide average. The group suggested looking at long-term trends in striped bass without the Artesian Slough fish, and looking at long-term trends at different locations in the Bay using shiner surfperch.

Only four composite white sturgeon samples were analyzed for mercury, with each composite composed of fish collected in the same embayment (samples from San Pablo and Suisun Bay were combined).

Mercury was mistakenly analyzed in whole fish samples of white croaker instead of muscle fillets. These data are available but will not be used in calculations relating to attainment of the TMDL. In response to this error, the RMP has instituted processes to minimize such mistakes in the future, including the development of detailed Sampling and Analysis Plans, the use of only written communication with labs, and more active oversight of the compositing process.

PCBs / Dioxins

Preliminary results show exceedances of the TMDL limit and no clear overall long-term trend in shiner surfperch. Results will also be analyzed on a lipid weight basis. PCB concentrations in Artesian Slough largemouth bass were above the statewide average.

Selenium

Significantly greater white sturgeon selenium concentrations were observed in Suisun Bay (in exceedance of the North Bay TMDL) relative to other regions in the Bay. Although the conceptual model for white sturgeon indicates that white sturgeon move throughout the Bay, these results suggest that white sturgeon in the North Bay, where abundant prey (i.e., the

invasive overbite clams) are available, may not be moving as much as previously thought. Long-term trends will be evaluated for different locations.

PBDEs

All PBDE concentrations are well below the OEHHA no consumption threshold of 100 ppb. PBDEs continued to show a clear decline in shiner surfperch in 2014. Lester noted that an additional round of sampling after a wet winter would be needed to fully confirm this decline, and offered to look at PBDE concentrations in the Guadalupe River from 2005-2014.

PFOS

No thresholds exist for PFOS in San Francisco Bay fish, but Minnesota has established a 1 meal per week consumption threshold of 40 ppb. OEHHA uses a 3 meal per week assumption to develop its thresholds, which would lower the threshold to approximately one third of 40 ppb. Some of the higher fish concentrations measured in the Artesian Slough are near this threshold.

The draft Sport Fish report will include additional analyses and will be completed by July 2016. The Sport Fish WG will meet in the fall of 2019 to review the draft report and discuss the design of the next S&T sampling that will occur in 2019.

Action Items

- Include link to the 2002-2003 CTR report and appendix in the 2015 report on CTR analytes (Don Yee)
- Talk to the Water Board regarding the potential policy implications for the six analytes with MDLs greater than criteria (Don Yee)
- Find out if individual white sturgeon samples were archived and are available for mercury analysis, and if so, request the analysis. (Jennifer Sun)
- Analyze PBDE trends in the Guadalupe River from 2005-2014 and report results to the TRC (Lester McKee)

8. Information: Preliminary Results from 2015 Bay Margins Sediment Study and Update from Sediment PCB Laboratory Subcommittee

Don Yee presented preliminary results for trace metals from the 2015 Bay Margins sediment special study. PCB analyses are on hold, pending the completion of an interlaboratory comparison study evaluating extraction and moisture handling procedures between AXYS and EBMUD. Axys indicated results from a special investigation using double extractions for this comparison study will be available in April.

Results from the 40 sampling sites in Central Bay did not reveal any major unknown contaminant hotspots for trace elements, and confirmed known hot spots for total mercury and methylmercury in San Leandro Bay, which is poorly flushed and receives high organic loads. Results largely confirmed expectations for contaminant distribution. More variation in total mercury was observed in the non-Marin Central Bay sites. No significant difference was observed between margins and open Bay sites in Marin, while concentrations of Pb and Ag were higher in the non-Marin margins sites compared to the open Bay. Legacy contaminant concentrations (Cd, Pb, Ag, MeHg) were significantly higher in the non-Marin sites, while naturally occurring elements (Al, As, Fe, Mn, Ni, Se) were significantly higher in the Marin sites. No significant difference in Cu, Zn, or Hg concentrations was observed by margins location. Further analyses will include additional statistical techniques and normalization of results to grain size and total organic carbon.

For future studies, Don recommended sampling in North and South Bays, which could provide baseline concentrations to measure against when conducting wetland restoration. Margins sampling could also be focused on priority margins unit areas in order to monitor the effectiveness of management actions. This type of sampling may not be highly effective in identifying new contamination hot spots, as depositional fields near sources may be very small.

\$120k is currently allocated each year for Margins sediment sampling as part of Status and Trends monitoring, rather than Special Studies. The 2015 sampling event required two years of funding to focus on Central Bay sites. The design of the next year(s) of sampling will be further discussed at the September TRC meeting and confirmed at the November Multi-Year planning meeting. A draft of the written report will be completed by September 2016.

9. Discussion: Annual Meeting Agenda and RMP Update Report

Annual Meeting Agenda

Jay Davis presented a draft outline of the 2016 RMP Annual Meeting agenda. Nutrient Management Strategy representatives suggested combining an RMP Nutrients Annual Meeting with the general RMP Annual Meeting, so the draft agenda outline included a half day of Nutrients talks (two out of four blocks) and a half day of general RMP talks.

Multiple TRC members felt that an entire half day of Nutrients talks was not necessary, and suggested instead including one session focused on Nutrients, one session on topics where Nutrients and general RMP topics overlap, and two sessions on the general RMP. Specific suggestions included:

- Rusty Holleman: modeling talk that spans both current Nutrients work and applications in other areas of the RMP

- Raphe Kudela, Jim Cloern, Dave Senn and/or CDFW: harmful algal blooms and toxins; why wasn't there a Pseudonitzschia bloom and domoic acid in the Bay last year?
 - Karen Taberski suggested including SPATT data, as well as creeks data and satellite cyanobacteria data from the Freshwater HABs program to broaden such a talk. Karen can provide some slides on lakes and Freshwater HABs program results.
- OEHHA: crab fishery closure and sport fish results & implications
- Nutrients: results from spring bloom characterization
- Dave Schoellhammer: El Nino monitoring; connection between sediment and nutrients

RMP Update

Jay presented an outline for the 2016 RMP Update Report. This year, the update will focus more heavily on the RMP's influence on management decisions, and will no longer include a data update (i.e., contaminant maps and "Trends at a Glance"). As Status and Trends monitoring elements are recurring less frequently, annual updates are no longer necessary, and all scientific updates will be published in the Pulse. The 2016 RMP Update will include two new articles: (1) a "Program Impact" article highlighting major decisions being informed by the RMP, and (2) an "RMP Relevance to Management Decisions" article based on the recent published manuscript on the RMP. Potential new focus areas for the RMP will not be discussed in this update, as they are still being developed.

Phil noted that at the last Steering Committee meeting, the option of not printing the RMP Update was discussed. It was ultimately agreed that it was important to provide hard copies of the document for easy access, and that costs would be minimized through a smaller document and print run (about 1,500 copies) than past efforts.

Bridgette and Eric recommended sending an early email to remind reviewers of the draft review period, and multiple reminder emails to ensure responses are received.

Action Items

- Update Annual Meeting Agenda with TRC suggestions (Jay Davis)
- Send an email to the TRC and other reviewers to mark their calendars for the RMP Update first draft review period of 5/15/-5/31 (Jay Davis)

10. Discussion: Plan for using or discarding old (>5 years) RMP archive samples

Phil Trowbridge presented a suggestion to reduce the volume and storage costs for short-term RMP archives by making samples collected over five years ago available for public use. The

oldest samples currently in the archive were collected in 1969, but samples can still be tested in a semi-quantitative (ie. positive/negative) manner.

The group supported this proposal and suggested several entities that may be interested in archive samples:

- Academic researchers at local universities, ie. UC Davis, UC Berkeley, Stanford
- USGS, ie. Robin Stewart
- Moss Landing Marine Laboratories
- California Academy of Sciences -- Robert indicated that CAS has done some work on tissue samples, though they may not have been frozen
- Northern California SETAC
- Water Board announcements to SWAMP

The group also recommended that the full archive same list be reduced to an “optimized set” of samples - ie. the minimum sample list necessary to represent the spatial and species distribution available - before they are advertised externally

Action Items

- Review “old” short-term archive sample list and create an optimized sample set for external distribution (Jennifer Sun)

11. Information: Status of Deliverables and Action Items

Phil Trowbridge gave an overview of the RMP Deliverables "stoplight report" and Bay RMP Action Items report (Agenda Package pages 34-44). No major comments or concerns were discussed.

11. Decision: Plan Meeting Dates and Agenda Topics for Upcoming Meetings

The next TRC meeting date was confirmed to be June 9th. Special Studies will be reviewed and approved at this meeting. The agenda package will be sent out with a Special Studies summary table at least one week in advance of the meeting.

The following TRC meeting date was set for September 21. This meeting will include a more comprehensive update on the Bay Margins studies and a review of recommendations for Status & Trends monitoring.

Action Items:

- Schedule a TRC meeting date for September 21 (Jennifer Sun)

12. Discussion: Plus/Delta

Group members requested copies of the informational powerpoints.

Action Items:

- Send the powerpoint presentations on draft RMP monitoring results to the TRC (Jennifer Sun)

The meeting was adjourned at 2:30