Bay RMP Technical Review Committee Meeting

December 8, 2022

Meeting Summary

Attendees (all participants remotely attending)

TRC Member	Affiliation	Representing	Present
Yuyun Shang	EBMUD	POTW	**No**
Mary Lou Esparza	Central Contra Costa Sanitary District	POTW	**Yes**
Tom Hall	EOA, Inc.	POTW	**Yes**
Heather Peterson	City and County of SF	CCSF	**No**
Anne Hansen Balis	City of San Jose	POTW	**Yes**
Bridgette DeShields*	Integral Consulting	Refineries	**Yes**
Chris Sommers	BASMAA (EOA, Inc.)	Stormwater	**Yes**
Shannon Alford	Port of San Francisco	Dredgers	**No**
Richard Looker	SF Bay Regional WQCB	Water Board	**Yes**
Luisa Valiela	US EPA	US EPA-IX	**Yes**
Ian Wren	Baykeeper	NGOs	**Yes**
Tessa Beach	US Army Corps of Engineers	USACE	**No**

Staff and Others

- Jay Davis - SFEI
- Melissa Foley - SFEI
- Warner Chabot - SFEI
- Miguel Mendez - SFEI
- Bryan Frueh - City of San Jose
- John Coleman -
- Don Yee - SFEI
- Martin Trinh - SFEI

1. Introductions and Review Agenda

Bridgette opened the meeting with a round of introductions and previewed the upcoming agenda. Of note are discussion of the draft final report on the Bay margins study, a science update on the algal bloom, and an update on the Status and Trends (S&T) redesign. Jay Davis stated that with the dynamic nature of the new S&T, discussion on the S&T will become a standing item at TRC meetings this year. Melissa Foley noted this will be her last Technical Review Committee (TRC) meeting as she transitions from the RMP manager role to the SFEI Resilient Landscapes team.

2. Decision: Approve Meeting Summary from September 21, 2022, and Confirm/Set Dates for Future Meetings

Bridgette DeShields asked the group for any final comments on the previous meeting's summary. Receiving no comments, Bridgette confirmed the dates for upcoming meetings. The next TRC meeting was confirmed for March 29, 2023. The TRC scheduled the following meeting to be held on June 20, 2023. Melissa confirmed that the 2023 RMP Annual Meeting will be held on Thursday, October 12, 2023 at the David Brower Center.

Action Item:

- Send out calendar invites for June 20, 2023 TRC meeting (Martin Trinh, December 15, 2022)

Decision:

- Richard Looker motioned to approve the meeting summary. Mary Lou Esparza seconded the motion. The motion was carried by all present members.

3. Information: Update on Search for New RMP Manager and Other Staff

SFEI staff members provided updates on the hiring processes for a few open positions. Jay informed the TRC that he had narrowed down the RMP manager position to three candidates. It is shaping up to be a difficult decision but he hopes to begin the process of extending an offer letter soon. Luisa inquired if there were any difficulties in the search process or with any other logistics. Jay clarified that all of the finalists were local and had extensive knowledge of the area. Melissa provided an update on the watershed modeler position. SFEI is putting together an offer letter for the preferred candidate at the moment. The Emerging Contaminants team has just opened a position for an Associate Environmental Scientist (Master's) or Environmental Scientist (PhD). A job posting and description were made available at SETAC, with over 65 applicants in the initial wave. The search is still open for this position. Luisa inquired if SFEI would

consider hiring if more funding was available, with SFEI members giving a resounding yes. On a potentially related note, Luisa informed the TRC that the WQIF awards will be announced in mid-December.

4. Information: MYP and SC Meeting Summary from October 20, 2021

Jay reviewed the October MYP and SC meetings, noting that this year's MYP meeting was a higher-level overview, rather than the normal more in-depth review of the budget and workgroup special studies. Key decisions and action items from the MYP discussion included the addition of tribal and subsistence beneficial uses as a Potential Future Driver, discussion of the revised S&T design and the need for ongoing review of CECs and pilot studies, and discussion of an updated process for continuing refinements to S&T [subcommittee (former the Council of Wisdom) to ECWG advisors to TRC to SC]. Workgroup strategy meetings are expected to yield major updates to the MYP for 2024, informed by subgroup meetings which will be regularly updated to the TRC and SC. Workgroup plans were reviewed for 2024 as well.

For the SC meeting, Tom Mumley and Karin North were reconfirmed as Chair and Vice-Chair respectively. Minor revisions to the RMP Charter and additional funds for coordination and the land use layer update for the Watershed Dynamic model, as well as funds to support strategy work for the Emerging Contaminants (EC), Microplastics, and Sources, Pathways, and Loadings (SPL) Workgroups were all approved. The 2023 detailed workplan was also approved. Discussions were held on preparing for event-based monitoring. Martin Trinh provided an update on the work done on the RMP website. The highlights of the 2022 Workplan and communications topics, such as the Annual Meeting, Update, Pulse, and Estuary News were also discussed.

5. Discussion: Bay Margins Sediment Survey – North Bay and Overall Summary

Don Yee of SFEI reviewed the 2020 North Bay Margins Sediment results. The North Bay study was the last in the series of margins pilot studies, with Central Bay completed in 2015 and South Bay in 2017. The objectives of the study were to assess contaminant concentrations in the margins and determine whether those levels are of concern and if they are different from concentrations measured in the open Bay. The South Bay margins constitute a much larger proportion of area relative to the North Bay which is in turn larger than the Central Bay. The North Bay margins were expected to be influenced by the heavily industrial land use (e.g., refineries) and Delta inputs, including mercury from historic gold mining in the Sierra. Don explained that a probabilistic design that

gave an equal weighting of the number of stations to area for San Pablo Bay, Carquinez Strait, and Suisun Bay was used to distribute the 40 stations. The margins were a mix of connected and discrete areas, with varied distances to the deepest areas. There were 40 samples in this round, with some add-on studies such as QACs. The target analytes for the study were PCBs, Hg, methyl Hg, and other metals. TN, TOC, and grain size were analyzed by ALS and supported by Eurofins. Archive samples were collected for additional work in the future. Summing 40 PCBs, highest concentrations were found in the Southern sites, especially near Chevron. Luisa inquired as to why Bay concentrations were relatively large, with Don noting the USGS had observed similarly in the past. Bridgette inquired about any correlations to grain size with Don noting that in the context of the rest of the Bay, North Bay concentrations were relatively low. Jay inquired as to why stations were concentrated in the north of Suisun Bay compared to the more industrial sites in the south. Don explained this could be due to the deepwater channel that runs there, resulting in narrow margins.

For Hg, concentrations were generally similar between the Bay and the margins, while PCBs were higher in the open Bay compared to the margins. Chris recommended looking at medians to compare, with Jay noting that 75th percentiles for margins and open Bay were much different in the Central Bay. Chris inquired if hotspot areas are significantly greater driving concentrations compared to ambient water as the Board is also curious about clean up of hotspots in older industrial (superfund) sites that might have brownfield components. PMU work is helping to contextualize this. Jay noted that the graphs support the notion that hot areas are driving concentrations. The drop in concentrations between the Central Bay and North Bay could be due to the Central Bay being a source.

Comparing the North and South Bays, Chris noted that Marin and Sonoma are not historical sources, similar to use in the South Bay, but Contra Costa has had a history of being a source. Heather Peterson also clarified that the North Bay is flushed more than the South Bay, allowing dilution and transport.

Raw mercury levels were lower in the margins than the Bay through much of the range of distributions although the difference is less pronounced after normalization of fines. Methylmercury was also higher in the ambient Bay than the margins although not significantly so. For all analytes, Bay concentrations are higher than in the margins despite the percentage of fine grain sizes being similar between habitats.

In conclusion, the North Bay margins exhibited lower concentrations than Central Bay margins, due to fewer sources and loadings. Dilution patterns also may be attributable to clean Delta loads. North Bay margins concentrations were also lower

than those in the South Bay due to faster hydrodynamic turnover. The North Bay margins concentrations were lower than ambient concentrations in the North Bay as Hg came from the Deltas and Central Bay along with PCBs from the Central Bay. Richard recommended exploring why individual contaminants might be higher in the North Bay, as opposed to comparing to the entire Bay. He noted the current narrative was not about individual contamination but more about mixing as these levels seem like a general phenomenon, not a pollutant-specific story. Melissa clarified that the North Bay margins were assumed to be similar to the deep Bay or even dirtier, in which case sediment thresholds would be conservative. However, these data suggest that this is not the case in the North Bay, with additional sampling being potentially helpful.

Don noted that this study is a good start but suggested that the North Bay could still have unknown hotspots. Chris stated that SFEI should not only be focused on central tendencies and could benefit from learning more about these areas, suggesting that this could be a special study, rather than a S&T topic. Luisa objected to being hung up over past assumptions and warned the group not to go down rabbit holes checking assumptions. Don clarified that this cursory glance is not enough to definitely state there are no hotspots. Jay and Bridgette supported continued sampling, with Melissa confirming for Luisa that PCB data will be collected this water year. In the future, margins sampling will include fixed targeted sites, with some repeat sites to evaluate trends, particularly at the nearfield at known and expected sources. Jay recommended revisiting this discussion about future margins sampling at the next TRC meeting. This will follow the release of a draft report on the margins work to the TRC in mid-January.

6. Discussion: S&T Monitoring Update

In this item, Melissa gave an update on the S&T monitoring occurring in the past year as well as in the upcoming year. Wet season sampling has included one storm in WY 2022, with one storm sampled in WY 2023. This wet season will continue until April. In the summer of 2023, a dry season effort will be conducted with the help of Applied Marine Science (AMS). Nearfield prey fish and sediment will be sampled in August 2023 with Bay sediment sampled from July through September of 2023 with the help of AMS. Marine mammals will be piloted in the upcoming year as a special study.

Elaborating on this year's wet weather water sampling, Melissa informed the TRC that the early November storm had been sampled but the first December storm had been passed on as the storm was considerably smaller and there was no potential to get paired ambient Bay samples on the USGS Peterson (due to the Peterson being in repair). Melissa inquired the group if, with another storm on the horizon, the RMP should collect near field samples only. Jay added some framing, that given the last few years, passing on storms is difficult, but thinking about design and what is lost if there

are no paired open Bay samples. Without open Bay, opportunities to investigate spatial comparisons are lost. Additionally, wet season data will not be able to be compared to the dry season. However, the near field samples allow for higher probability of detections of CECs in the Bay and are useful for developing time series of semi-quantifiable trends. Chris inquired if the data will primarily be analyzed on an event by event basis or assessed across events. Luisa suggested that opportunities are rare and if the Peterson is never fixed, then the RMP would regret passing on this opportunity. The group agreed that the data will be useful, even if not paired. Chris and Richard encouraged the group to consider how data will be assessed in the future, especially over time.

Dry season water sampling will be conducted in July and August of 2023, focusing on CECs along with some legacy contaminants at 22 stations (6 historic).

The nearfield prey fish and sediment pilot will focus on topsmelt and silverside and has been budgeted for 12 stations for fish and sediment. Areas with overlap with nearfield wet season water and sport fish sampling will be emphasized. There will be 10 stations for prey fish and 12 stations for sediment in those priority areas. There are two airport stations of interest for prey fish that are less well connected to overall S&T design; Melissa asked the Committee if they were worth sampling. Miguel explained there was a PFAS connection to the airports, as an ingredient of fire fighting foams used at airports. SFO is also close to a wastewater treatment plant with this site near the outfall. A concurrent analysis of PFAS and chlorinated paraffins in archived sediment, which are both of interest, will also benefit from sampling at this site. Chris expanded on his experience with the Oakland airport and noted the large impervious areas where firefighting foams could have discharged at multiple points. Luisa also mentioned the EPA's sampling of SFO in 2014 and recommended contacting the airport people to notify them of the sampling. If these sites are not sampled, the TRC recommended saving the money and only sampling at the original 10 sites. The TRC is on board with sampling here as it will fill data gaps, with Ian recommending telling the airport people that this is an attempt to monitor the effectiveness of regulation. However, budget constraints must be considered. Chris agreed to help connect Miguel with staff at the airports.

Melissa expanded on the 2023 margins sediment efforts centered on CECs and ancillary analytes in the Central, South, and Lower South Bay. 24 stations were budgeted, with areas weighted (9 CB, 9 SB, 6 LSB). There is interest in resampling near Chevron. Currently, there are no fixed stations established in the margins pilot, with staff suggesting two fixed stations per subembayment, two repeat stations (2nd and 4th event), and the rest as random stations. Don explained to Richard that targeted stations

could be linked to conceptual models. Further discussion on the margins, Bay Sediment, and Marine Mammals will occur at the March meeting.

7. Discussion: Interlaboratory Comparison Studies

Due to lack of time, the discussion on interlaboratory comparison studies was tabled to the March TRC meeting. Don is still developing the workplan and welcomes offline input during this process.

8. Discussion: Algae Bloom Follow-up

Following the break, Dave Senn of SFEI presented a high-level overview of the recent harmful algae bloom event that occurred in August. An unexpected and major monitoring effort was supported by a number of collaborators, including the USGS Biogeochemistry team, SFEI, and Baykeeper who were the first to alert other parties as well as the public. In late July, the organism Heterosigma akashiwo was first observed around the Alameda/Oakland deep channel. This organism has known toxicity to fish and was previously placed on the San Francisco Bay-Nutrient Management Strategy's (NMS) harmful algae "watch-list". In early August, the NMS was able to track the bloom via remote sensing to the Central Bay off of Alameda. By August 20th, the bloom had expanded through the South Bay with Chl-a levels varying from 50 to > 100 ug/L (20x typical values), with its center of mass in the South Bay. Previous blooms usually only lasted for a few days over a small portion of the Bay, but this event was much more long-lasting and pervasive. The bloom abruptly terminated over the course of three days from August 28-31, with levels declining to less than 5 ug/L. Fish mortality rates declined in the South, Central, and San Pablo Bays.

Heterosigma akashiwo was first found in Richardson Bay in 2002, using microscopy methods. The primary method from 1993 to 2013, microscopy was then retired in favor of imaging which has been in use since 2015. Discrepancies in observed concentrations between these time periods may be a function of methodology. Since the switch to this method, Heterosigma akashiwo has been detected at low levels in the Bay around 45% of the time. Dave noted that 12 out of 14 of priority HABs are flagellates. He then reviewed the monitoring and data exploration associated with this event. There were five water quality moorings, with three more sites added in 2022. Seven high speed mapping surveys were conducted along with four cruises with the USGS. Remote sensing was essential to informing numerical models.

Key questions to be addressed in the future are what factors led to this event, what is the likelihood of something similar occurring again in the near term (1-2 years), and

what longer-term management options would be effective at preventing or mitigating impacts if another event were to occur.

Opening the discussion, Luisa noted that although nutrients were a primary contributor to this event, messaging could also be centered on climate change. Luisa also mentioned that other reports cited that the largest fish kills were in the Central Bay in Lake Merritt. Dave noted that there were some discrepancies in the reports of fish kills, with no certain reports on the number of fish kills. The timing of the fish kills preceding DO drop-offs suggests a toxic component to the bloom. Tom Hall suggested monitoring enhancements such as imaging flow cytobots to detect harmful species more promptly. Richard took this opportunity to connect this discussion to the SC discussion on needing procedures for future event-based monitoring. He suggested Dave and other colleagues could get these discussion started by mapping out an event-based approach for future HABS, considering if there should be a surveillance program that could provide timely alerts. Dave agreed that near term recurrence risk would be assessed, with particular attention to the likelihood of low suspended sediment concentration (SSC) especially in dry vs. wet years. As for the suggested surveillance program, Dave questioned what could be done with the information. If the data is only useful for informing the public but not mitigating any effects, Dave questioned if this system would be worth the investment. Additionally, this raises the question of who is responsible for keeping up with HAB events in the future.

9. Discussion: Communications Update

For this agenda item, Jay gave a brief review of various RMP communication products. Jay thanked all involved for their contributions to the 2022 Pulse and announced that physical copies will be shipping soon. There were some issues with the early batches, but they should be resolved soon. Keeping up with the theme of the 50th Anniversary of the Clean Water Act, Jay contributed to an op-ed published in the San Francisco Chronicle reflecting on the Act. This content has also been the basis of recent presentations to the San Mateo County CCAG and Contra Costa Clean Water Program Management Committee.

Jay then gave a quick summary of attendee feedback following the 2022 Annual Meeting. 85 people attended the event in person at the David Brower Center, joined by 245 online participants on Zoom. Survey results indicated favorable reception, with the hybrid format and individual speakers being lauded in particular. The Center has been reserved for October 12, 2023 for the upcoming Annual Meeting. Jay informed the group that the Estuary News will be sunsetting, with its final issue coming in March 2023. Ariel Rubissow Okamoto has expressed interest in a final RMP article related to the issue theme of restoration.

Jay concluded the item by reviewing the communications strategy developed by the Steering Committee in 2014. He noted that many communications elements have changed over the years, particularly noting how the Annual Meeting's new hybrid format has allowed for a wider audience. Richard and Luisa advocated for the distribution of a poll to TRC and SC members to prioritize elements and methods of communication. John suggested moving the Estuary News online or approximating it by sending updates to the RMP newsletter.

10. Information: Status of Deliverables and Action Items

Jay provided an update on the status of RMP deliverables and action items. Just completed items included the bisphenols in water and sediment report, PCB bioaccumulation thresholds in dredged sediment report, and non-targeted fire monitoring summary for managers (and journal article). The non-targeted analysis in sediment has been delayed as Lee Ferguson is no longer able to provide a report; Rebecca Sutton will take on that responsibility going forward. The selenium data report for 2019-2020 will be completed by the end of the year. Deliverables due before the next meeting include the South Bay settling velocity report, Benicia Bridge sediment flux report, regional watershed dynamic model for sediment, interim updated land-use layer, sediment conceptual model, floating percentile sediment guidelines, and PFAS in Bay water final report. Delayed deliverables include the bird egg effort as SGS AXYS sorts through import permit issues, San Leandro Bay PCB report (lab delays), and the stormwater monitoring approach as the groundwork project has been prioritized. The sunscreen in wastewater report has also been delayed as Diana Lin has assumed responsibility for that report from Stanford. It will be completed in spring 2023.

11. Discussion: Plan Agenda Items for Future Meetings

Jay previewed topics of interest to discuss at future meetings. Richard could preview the 303(d) decisions if data are available by March. The S&T update and workgroup strategy development updates will remain standing agenda items throughout the upcoming year. The margins final report and next steps for monitoring will also be featured at the next TRC meeting.

12. Discussion: Plus/Delta

Despite the meeting's lack of eggnog and holiday chocolates, the group especially commended the science presentations from SFEI. Luisa commented that she enjoyed the day's agenda and would be happy to continue many of the discussions had further online afterwards. The group expressed their appreciation for Melissa and the work she has done as RMP manager.