RMP Emerging Contaminants Workgroup Meeting

March 30, 2017

San Francisco Estuary Institute
4911 Central Avenue, Richmond, CA

Meeting Summary

Attendees

Science Advisor	Affiliation	Present
Lee Ferguson	Duke University	Yes
Kelly Moran	TDC Environmental	Yes
Derek Muir	Environment Canada	Yes
Heather Stapleton	Duke University	Yes
Bill Arnold	University of Minnesota	Yes

Others Present

Luisa Valiela (USEPA, Region 9)
Tom Mumley (SFBRWQCB)
Dawit Tadesse (SWQCB)
Karin North (City of Palo Alto)
Mary Lou Esparza (Central San)
Jim Ervin (City of San Jose)
Arleen Feng (BASMAA)
Jennifer Teerlink (DPR)
June-Soo Park (DTSC)
Anne Cooper Doherty (DTSC)
Daphne Molin (DTSC)
Shoba Iyer (OEHHA)
Keith Maruya (SCCWRP)
Jiawen She (CDPH)
Yu-Chen Chang (CDPH)

Tom Bruton (Green Science Policy Institute)
Eunha Hoh (San Diego State University)
Miriam Diamond (University of Toronto)
Rebecca Sutton
Meg Sedlak
Diana Lin
Jennifer Sun
Philip Trowbridge
Jay Davis
Don Yee
Lester McKee
Terry Grimm (Cambridge Analytical)
Michael Lyon (LARWQCB)
Denise Greig (Cal Academy)
Mike Elliott (SGS)

The last page of this document has information about the RMP and the purpose of this document.

1. Introductions and Review of the Agenda

No changes were made to the agenda.

2. Discussion: Revised CEC Strategy

<u>Management Questions</u>
Key discussion points are summarized below:
- **Framing:** The group discussed further expanding the CEC management questions. It should be made clear that the questions will apply separately for each CEC compound class. Tom requested additional description and contextualization of the questions in the strategy, including descriptions of how these questions will be applied and/or addressed using differents study types, how they relate to different types of management activities, and how they will be used to identify potential feasible management actions.
- **Sources, Pathways, and Loadings:** Tom suggested separating the second management question into separate questions about (1) sources, pathways, and loadings; and (2) contaminant fate and transport processes. The strategy should more explicitly emphasize the strategy for monitoring sources. Lee pointed out that process-specific studies are often extremely difficult to conduct. The group then began to discuss other types of studies that would provide the most useful information about sources and pathways to inform management.
- **Prediction/forecasting:** Kelly Moran and Miriam Diamond both described the need to be able to predict what compounds will be of concern, in order to both inform product design and enable more proactive management activities. Tom and Jay suggested adding a question related to forecasting (i.e. what concentrations do we expect to be increasing).
  Kelly Moran described the need to predict what compounds will be of concern and provide feedback for the design of products. Anne Cooper added a specific interest in predictive tools for classes of compounds, to inform assessments of alternative compounds. Kelly explained that DTSC's alternative assessment tools rely in part on predictive information about the environmental impact of alternative compounds; this information is being produced in part by DPR, which has developed some numeric predictive models, as well as EPA, and these models in turn can be informed by information produced by the RMP.
  Jennifer Teerlink indicated that it would be useful for the RMP to also work towards explicitly identifying contaminant pathways that can be most influenced through management actions, and suggested the fourth management question be revised to reflect this linkage.
- **Upstream activities:** Miriam Diamond emphasized the need to be able to predict trends from classes of chemicals based on land use changes, changes in socio-economics, and climate change. In a similar vein, Bill Arnold suggested spending more time on developing conceptual models to help narrow down where studies and management activities should be focused, given that detailed process-oriented studies to understand how compounds behave in the environment can be very complex, expensive, and compound-specific.

<u>Tiered Risk Framework</u>
Downgrading chemicals in the risk framework
The group agreed that any time a compound is downgraded within the tiered risk framework, the default action should be to continue monitoring for a while to confirm levels continue to decrease as expected. Tom Mumley also suggested creating sub-categories of low concern chemicals, for those that are (1) no longer of concern or (2) of low concern or priority for management, but should continue to be monitored. Miriam Diamond also highlighted the value of continuing to monitor compounds like PBDEs not only to

support scientific conclusions about the effectiveness of management actions, but also to support ongoing public communications demonstrating the effectiveness of management actions.

There was general agreement that PBDEs should be downgraded from Tier 3 to Tier 2, but that monitoring should continue for a few more years to confirm the downward trend and also to demonstrate the effectiveness of regulatory action. The group agreed with the proposal to discontinue PBDE monitoring in bivalves, but to continue monitoring in sediment, bird eggs, and sport fish. Birds are particularly sensitive to PBDEs, which can cause reproductive effects, and Dr. Jianwen She (California DPH) emphasized the value of monitoring eggs of terns, which are top food chain predators.

Karin North agreed that bivalves should be removed from Status and Trends monitoring. Tom Mumley asked what is the most cost-effective strategy to sustain long-term trend monitoring. Keith Maruya said that NOAA's Mussel Watch program may revisit California in 2018, in which case bivalves may be monitored for PBDEs as part of the program..

Moderate concern chemicals
Tom Mumley agreed that any compounds that are in the Tier 3 category should have a full action strategy that is regularly reviewed. Nonylphenol ethoxylates are currently in Tier 3, but a strategy for monitoring and managing these chemicals needs to be developed.

Decisions:
- The group agreed to downgrade PBDE to a Tier 2 low risk compound group, but to recommend continued monitoring these compounds according to the suggested Status and Trends schedule (monitor in sediment, bird eggs, and sport fish, but not bivalves).

Status and Trends
Archive Strategy
Tom Mumley suggested including an explicit archive sample management plan in the CEC strategy, in order to highlight the possibility of using archives to look retrospectively at historical contaminant levels, and to prioritize the level of effort for archiving. Terry Grimm suggested archiving leftover chemical extracts, and Derek Muir indicated that his program archives raw sample extract (i.e., after lipid removal and other cleanup steps, but before standards are added).

Status and Trends Analyte Lists
- Kelly Moran suggested adding neonicotinoids to Status and Trends water sampling if the 2017 special study shows substantial levels of these compounds in ambient Bay water.
- Jennifer Teerlink strongly supported sampling of fipronil in sediment, at least through 2023, which will provide valuable data to DPR to evaluate the effectiveness of management actions.
- Tom Mumley supported conducting periodic non-targeted analysis, but indicated that the RMP (particularly the Steering Committee) would need to discuss how to fund these analyses (i.e., through Status and Trends or special studies, for example).

General Strategy Comments
- **Compound categorization:** Lee Ferguson and Tom Mumley supported separating pharmaceuticals and personal care products into separate categories, and including plastic additives (which also include some organophosphate flame retardants) as a separate category as well. This may require recategorization of alternative flame retardants into multiple groups as well.

      Anne Cooper Doherty requested further discussion in the strategy about chemical class categorization, to help inform DTSC guidance on the use of chemical alternatives.

- **Communication:** Kelly Moran and Jennifer Teerlink suggested that the strategy include an explicit step for coordination, communication and collaboration with partner agencies, such as DTSC and DPR.
- **Compound identification:** Derek Muir suggested using CAS numbers to allow searches of individual compounds of interest within the RMP's previous CEC work. The Multi-Year Plan currently describes previous work only in lumped categories. Derek suggested Rebecca contact Tony Williams, who works on the EPA Chemistry Dashboard that links from CAS numbers of data sources. The RMP could potentially be added as an additional data source.
- **Risk framework categorization:**
  - Tom Mumley suggested indicating which Tier 2 low concern chemicals are (1) no longer of concern or (2) of low concern or priority for management, but should continue to be monitored.
  - Anne Cooper Doherty also suggested differentiating compounds are classified as Tier 2 low concern compounds because (1) they have been monitored and determined to be of low concern, or (2) not enough data is available to make a different classification.
  - The group agreed that the current Tier 1 class of compounds should not be displayed or "ranked" as being below the Tier 2 low risk class. Instead, the current Tier 1 should be a separate category of compounds that require additional study.
- **Risk framework notations:**
  - Jennifer Teerlink suggested using different symbology to indicate whether compound use or monitoring data suggest levels are thought to be increasing or decreasing. Arrows suggest the presence of increasing or decreasing trends in the real world, which is not always what is meant to be implied.
  - Kelly Moran suggested noting which compound classes have related management actions already in place.
  - Tom Mumley suggested creating a separate matrix to include information on use trends, regulatory activities, available monitoring data, and other relevant metadata-type information on all compounds classes.

Alternative Flame Retardants Conceptual Model Needs

Arleen Feng presented a proposal to begin planning to develop larger 2019 Special Study proposal for a conceptual model for alternative flame retardants (AFRs) in stormwater, and requested feedback from the group.

The science advisors emphasized that an AFR conceptual model should take into consideration that AFRs are a broad class of compounds with a wide range of environmental behaviors. PBDEs may not be the appropriate group of compounds to use as a starting point to assess AFRs, particularly if there is a focus on understanding more than sediment-bound contaminants. However, modeling tools can be used to predict AFR behavior and identify optimal sampling locations for the AFRs of interest. A sampling strategy should include partnering with DPR, which may be sampling some of the same locations for their own studies.

Many compounds that are categorized as AFRs, especially organophosphate flame retardants, have other sources; this class in particular has been used as plasticizers for a long time. Other sources should

be considered in any conceptual model. Miriam Diamond also advocated for using multi-media models, including combining suspended sediment and hydrologic models, at minimum.

3. Information: Non-Targeted Analysis of Polar Compounds in San Francisco Bay Water and Effluent

Lee Ferguson presented preliminary results from the 2016 non-targeted analysis study of polar organic contaminants in ambient Bay water. This study included analysis of grab samples and passive (POCIS) samplers deployed in San Leandro Bay (i.e., stormwater influenced), Napa River (i.e., agricultural runoff influenced), and Coyote Creek (i.e., wastewater influenced).

The analytical screen included about 150 targeted analytes with standards, as well as non-targeted analytical methods that identified on the order of 3,000-5,000 compounds per analysis. Of these compounds, about 1/3 of samples had no MS/MS spectra, due to the complexity of the sample (i.e., the instrument is unable to measure spectra as quickly as compounds are eluted). These compounds were only able to be characterized to a molecular formula level. Detections are generally biased towards compounds present at higher abundances, while lower abundance compounds are more commonly skipped. Of the compounds with spectra, only 6.5% had library spectra matches (m/z cloud, ChemSpider). Those without library spectra matches were tentatively identified where possible using in-silico fragmentation predictions. Results were normalized to internal standards to account for matrix effects, and were also blank subtracted.

Comparisons between grab samples and POCIS samples showed a relatively good correlation between the sampling types, with better agreement for high abundance compounds. However, in San Leandro Bay, grab samples generally showed greater peak intensities than the POCIS samples, suggesting that the passive samplers can become saturated and in some cases may not reflect true contaminant abundances. Grab samples collected during high and low tide on the Napa River also showed substantial differences, with greater intensities found during low tide, with greater influence from runoff vs. Bay water.

Another key result of this study was that the stormwater-influenced site appeared to be more contaminated than the wastewater-influenced site**,** with higher peak intensities. Lee then presented a series of volcano plots highlighting contaminants identified at each site that were not observed in wastewater. Over 50 compounds not identified in wastewater were identified with high confidence MS/MS library hits in the San Leandro Bay samples, many of which were polyethoxylated compounds. Other highly detected and highly abundant compounds included the fungicide myclobutanil, and vulcanization products (from tires, indicating an urban source), as well as other polymer additives.

In the Napa River, 44 compounds not found in wastewater were identified, with only a single library match for a simazine pesticide breakdown product. Tentative identifications in the Napa River suggested presence of natural products from non-urban runoff. The contaminant profile in Coyote Creek suggested that this area is essentially diluted wastewater, as expected.

Bill Arnold noted that in his passive sampling studies, he has found that comparing both grab and passive samples has been useful, with slightly different contaminant profiles identified in each type of sample. Keith Maruya indicated that many similar compounds have been identified in Southern California as well, using GC analysis methods.

The group then began to brainstorm potential sources further upstream that could be causing the detections seen in San Leandro Bay. Arleen Feng explained that although San Leandro Bay occasionally receives combined sewer overflow from EBMUD, it was unlikely that overflow occurred during the relatively small or moderate storms that occurred in the spring of 2016 when sampling occurred in that region. Kelly Moran indicated that myclobutanil, the fungicide detected at a particularly high intensity in San Leandro Bay, has been registered for many urban uses, including applications on trees, grasses, ornamental plants, and over-the-counter uses. The lowest toxicity threshold for myclobutanil is 100 ug/L, which Kelly speculated is likely greater than even the high levels that were observed in San Leandro Bay. Carbendazim, another high intensity compound, is a breakdown product of benomyl, a fungicide registered for many urban uses as well.

Derek Muir suggested using the TSCA high production volume compounds to identify compounds and identify any correlations between detections/intensities and production volume. Lee indicated that he typically does not use production volume in his prioritization, to avoid biasing his analyses towards industrial chemicals and away from natural products.

4. Summary of Special Study 2018 Proposals

SFEI staff presented proposals for special studies in 2018, followed by brief clarifying questions. Comments and questions regarding each study are summarized below.

In introducing the proposed 2018 studies, Rebecca highlighted the theme of margins sediment sampling; many studies were designed to leverage the 2017 margins sediment sampling occurring in South Bay and Lower South Bay. It was noted that Dave Schoellhamer's previous work showed that Lower South Bay was a depositional region in general, and Don explained that any scouring that may have occurred during the past wet year was unlikely to completely remove all or most of the top 5 cm of sediment that is collected for this type of sampling. Therefore, margins sampling in the summer of 2017 would be likely to capture relatively recent deposits of sediment and associated contaminants.

CEC Strategy
Miriam Diamond suggested that the strategy include an integration task, to support synthesis of recent work and policy updates for key chemical groups. The group agreed that the CEC strategy can be presented as a mandatory funding line rather than a proposal.

Characterizing Unknown PFAS in Seals and Margin Sediment
Kelly Moran suggested adding a budget line for communications with press and policymakers, given that this class of chemicals is of growing policy interest and this study has the potential to influence policy.

Non-Targeted Analysis of Margin Sediment and Related Studies
The group was supportive of this study, but given the high cost of the overall study, wanted to explore the opportunity to reduce the scale of the study. Lee Ferguson indicated that funding below $20,000 would make it difficult to participate in the study at all.

Nonylphenol Ethoxylates in Margin Sediment
Heather Stapleton suggested that this study may be redundant with the non-targeted analysis work, which was shown in Lee's earlier presentation to detect nonylphenol ethoxylates. However, this targeted study would be able to better quantify the levels of these compounds, and would not cover the shorter chained NP/NPEs that have been previously detected by RMP Status and Trends, but are not detected in Lee's

non-targeted analysis. Miriam Diamond also suggested that there could be a benefit in having the same laboratory (AXYS) measure NP/NPEs again with a new method.

Multiple group members suggested scaling back the study, or conducting monitoring at shallow sites during water or ambient sediment monitoring efforts. Rebecca indicated that scaling back could be possible, given that the purpose of the study is to conduct a screening exercise rather than conduct rigorous statistical analysis to evaluate source types. Lee Ferguson suggested that future studies could focus on a broader range of polyethoxylated surfactants, including alcohol polyethoxylates, which are typically removed in wastewater. However, they may also be present in stormwater, potentially causing endocrine disruption in streams and/ or receiving waters.

Pesticides and Wastewater Contaminants in Margin Sediment and Water

Stakeholders interested in pesticide work were strongly supportive of this study. Jennifer Teerlink and Kelly Moran explained that this study would fill an important gap in DPR's priority sampling, which typically does not look at ambient locations that integrate stormwater and wastewater effluent. DPR does not monitor pesticides in the Bay, despite an expectation that the Bay margins may be some of the most contaminated regions.This study would complement the non-targeted analysis by quantifying pesticide levels, including pyrethroids, with low detection limits. The methods include pesticides that are not professionally applied, as well as strobin fungicides, which are of interest to DPR and other pesticide stakeholders and experts.

Non-Targeted Analysis of RO Concentrate

The group expressed general support for the study idea, but felt that it fell outside the scope of the RMP to fund. Lee Ferguson indicated that samples could potentially be archived after extraction.

Pharmaceuticals in Effluent Report

The group expressed support for this study. Anne Cooper Doherty expressed support from DTSC, which is interested in some of the non-pharmaceutical compounds, such as triclosan. Karin North reiterated that many of the participating wastewater treatment plants would need to rely on the RMP to assist with data QA/QC review. Rebecca explained that the study focused on a subset of the available pharmaceutical analyte lists available through AXYS primarily due to budget constraints - specifically, the study focused on AXYS lists 1,3, 4 and 5.

5. Discussion of Recommended Studies for 2018

The planned budget, if all the proposals were funded, is $550k. The target planning budget is $505k. The workgroups are directed to prioritize studies to different levels, assuming the Steering Committee allocates between 50% and 100% of the target budget. Phil later clarified that about $250k of alternative monitoring requirement funds from wastewater agencies has been specifically earmarked for CEC studies. Karin North also highlighted that Supplemental Environmental Project funds could potentially become available outside of the standard RMP funding process, so projects that are not prioritized for funding today should still be prioritized for potential future funding.

Nonylphenol/Nonylphenol Ethoxylates

Lee Ferguson was asked whether the nonylphenol/nonylphenol ethoxylates had different toxicity levels or mechanisms than the other polyethoxylates that would be covered by the non-targeted analysis, to help determine whether including those compounds in a targeted analysis was important. Lee indicated that the current thinking is that the nonylphenol and the short-chained nonylphenol ethoxylates are not

necessarily the dominant source of toxicity in this class, and that other polyethoxylates have other mechanisms for toxicity besides degrading to nonylphenol. Lee emphasized the need to look at a broader class of compounds beyond nonylphenol/ethoxylates and their precursors. In particular, toxicity of polyethoxylated alcohols has been poorly studied, in part because they are efficiently removed during wastewater treatment; however, these compounds have been detected in stormwater (i.e., very abundant in stormwater-influenced ambient Bay water) and may be cytotoxic and estrogenic. It was noted that EPA has a framework for estimating toxic equivalency factors for polyethoxylates, but only based on estrogenicity.

<u>Perfluorinated Compounds</u>

Meg explained that the TOP assay and QTOF analyses would provide complementary information about previously unidentified perfluorinated compounds in sediment. In addition, the researchers at Colorado School of Mines will specifically quantify a short list of PFAS compounds such as PFOS, PFOA, etc. The TOP assay degrades precursor compounds to carboxylic acids analogs; the LC-Q-ToF-MS method identifies a broader list of compounds, some of which would not be oxidized and identified using the TOPassay. These methods would be able to provide information about relative abundances of individual compounds.

It was asked whether sediment and water samples should be analyzed concurrently, given that some of these perfluorinated compounds do not sorb to sediments particularly well. Meg explained that previous water sampling has shown largely carboxylic acids that are at levels similar to what is observed elsewhere, but this study focuses on PFOS, which has been found at particularly high levels in South Bay biota and sediments. Previous Bay sediment studies have also found a variety of PFOS and PFOA precursors includingpolyfluoroalkyl phosphoric acid diesters (diPAPs). Derek Muir also noted other studies of river sediments that showed that essentially all the perfluoro compounds of interest, including variants with various additional alkyl groups, are found in sediments, which appears to serve as the primary reservoir for these contaminants, not the water column.

Heather Stapleton asked whether gender, age, and/or size, would be taken into account when measuring PFAS levels in seal serum samples. Literature on human serum samples suggests different body burdens by sex. Meg acknowledged that this is true for humans but that not all species exhibit a difference. To date, RMP data have not identified a significant difference in PFOS in males vs females. Meg also mentioned that PFAS body burdens can be transferred from mother to offspring. The purpose of this study is to identify other PFAS compounds that may be in use beyond the 12 or so that the RMP routinely monitors. Concentrations of PFOS in biota are decreasing and it is not clear what alternatives the market is moving to. In addition, the seal study would also assess trends (since 2012). This study is a smaller screening study to identify novel compounds rather than a robust statistical analysis of levels of specific compounds and potential causes.

<u>Non-Targeted Analysis of RO Concentrate</u>

Miriam Diamond asked whether the RO concentrate non-targeted analysis would miss contaminants that coagulate or settle out in the wetland. Rebecca noted that the water is filtered through a 10 micron filter prior to entering the treatment wetland, which should reduce the level of particulate contaminants. Phil also explained that ultimately the biomat and any particles that settle out are planned to be regularly removed, replaced, and disposed of, so this kind of material may not need to be considered in evaluating compounds that may reach the Bay in discharged effluent.

Kelly asked whether other types of studies might be able to provide similar information to this proposed study. Lee explained that this study is meant to look specifically at the transformation processes occurring during this treatment process. One major objective is to assess whether new compounds of concern are being produced during treatment, and proactively identify potential new contaminants that would not be

identified through other studies. Karin North and Tom Mumley clarified that the RMP would not fund this study as it does not directly address RMP management questions, although alternate funding sources might be available.

Derek Muir asked why additional targeted compounds (i.e. perfluorocompounds and nonylphenol ethoxylates) are not a larger part of this project. Phil and Rebecca explained that a short list of targeted analytes, including PFOS and PFOA (but not NPEs), have already been included in the Santa Clara Water District funded study. Lee also explained that another purpose of the non-targeted study would be to look at compounds impacted by the advanced oxidation treatment -- i.e. brominated and chlorinated compounds that might be created after oxidation in a high ionic strength solution.

Non-Targeted Analysis of Sediment

Heather Stapleton supported the idea of using two complementary non-targeted analysis methods at once, but asked how the results would be compared, given the complications of using very different workflows. Lee indicated that the labs would be primarily comparing lists of tentative identifications, rather than spectra. A scatterplot comparison between the two labs of the retention time for a compound with a tentative ID match could then serve as confirmation that they have correctly identified the same compound; similarly such a plot showing similar retention time for a compound with two different tentative identifications but the same molecular formula might suggest that additional analysis is needed to evaluate the true structure and identity of that compound.

Eunha also indicated that the two labs already use similar methods of prioritizing which compounds to work towards identifying, and can further work with each other and the RMP to sync this prioritization process to focus, for example, on compounds identified with high frequency or using other methods of interest to the RMP. This way, the two labs can also work in an even more complementary way, with one lab filling gaps that may exist in the others' identification workflow. Exploring methods for merging data between the two labs will be part of the purpose of this project; Lee also cautioned that because these are exploratory methods, the deliverable will not include a validated list of identified compounds. Jennifer Teerlink and Kelly Moran mentioned the importance of having the RMP review the tentative identification list to identify compounds of toxicity concern, or those that could serve as important indicator compounds for different sources.

Pharmaceuticals Data Reporting

Derek Muir asked whether enough data was available to look at trends in pharmaceuticals data. Rebecca clarified that the only previous RMP study of pharmaceuticals in wastewater took place in 2006 at two wastewater treatment plants in Lower South Bay, so comparisons of pharmaceutical levels would be relatively qualitative. The purpose of this study is to serve as a first step to identify whether there are compounds that should be monitored in ambient Bay water. The study will also include a simple conservative tracer model (i.e. no degradation, no transformation, etc.) to conservatively estimate ambient Bay rough concentrations based on wastewater effluent concentrations.

Jennifer Teerlink asked if good information is available about how much recycled water is used for irrigation, which could be used to estimate how much might runoff into the Bay. Karin North indicated that she can provide this information compiled by BACWA, but that likely very little of this irrigation water reaches the Bay, as recycled water is typically used for this purpose during the driest periods of summer and overspray is not permitted.

Pesticides

Kelly Moran asked how the pesticide study leverages the USGS NAWQA study, which will focus on upstream freshwater sites. Becky indicated that the studies would be easier to compare given that the samples would have been collected at the same time. The USGS data will likely not be published until a

year or two after the RMP data, so efforts to compare across the data sets or conduct modeling would occur at a later time.

Other Studies and Priorities

Miriam Diamond commented that none of the proposed studies appeared to be focused on developing an inventory of contaminant levels, for which the study designs would need to be more representative of what is seen at different types of locations and times in the Bay. She also provided a broader suggestion to develop a criteria matrix to help guide prioritization for the group, including outlining different types of studies and identifying how the proposed studies fit into the universe of various possibilities and priorities. Rebecca, Jay and Karin indicated that no formal scoring system has been used or needed in the past, but it could be considered if stakeholders would like a more formal process.

Kelly Moran brought up two potential ideas for future study: (1) pesticides in wastewater, and (2) antimicrobial compounds in environmental matrices (stormwater, wastewater, and ambient Bay water). Kelly has been compiling a priority list of antimicrobial compounds of interest.

Agency Priorities

DPR strongly supported the pesticide study, which would provide very useful data to inform DPR's current planning process. DTSC indicated a high level of interest in triclosan and PFAS, but also indicated that data on nonylphenol ethoxylates, alcohol ethoxylates, and non-targeted analyses would be useful in informing the development of future plans. Daphne Molin explained that the DTSC's planning process will not prioritize any aquatic chemicals without monitoring data, so non-targeted analyses that will identify potential compounds of concern is extremely important. Data on high priority compounds like triclosan and PFAS may also be useful even if rules are already in motion, in order to help demonstrate the effectiveness of management actions in the future.

Becky explained that sediment archiving is possible if funding is not available in 2018, but a small amount of funds will still be needed to collect the samples and coordinate the archive activities.

6. Closed Session - Decision: Recommendations for 2018 Special Studies Funding

7. Report Out on Recommendations

Study Name	Proposed Budget	Modified Budget	Priority	Notes
EC Strategy	$65,000	$65,000	1	Deliverables should be more specific. Should be for RMP work/products.
PFASs in Seals and Sediment	$78,000	$50,000	5	Collect sediment now and postpone seal collection. Determine new cost. Second option is collect sediment and archive ($10,000).

NTA in Margin Sediment	$118,000	$101,000	4	Remove dye analysis and DM. Add cost to archive raw extract for future analysis (dye, NPE, etc.).
NPEs in Margin Sediment	$54,000	$10,000	6	Collect now and archive samples. Investigate whether can use extract from NTA. Update cost estimate. NPEs are a State Board priority. Get a quote from Lee for running the NP/NPE at the same time as the NTA.
Pesticides and Wastewater Contaminants in Margin Sediment & Water	$126,000	$126,000	2	
Pharmaceuticals in Wastewater	$30,000	$30,000	3	
NTA of RO Concentrate	$59,000			End goal is evaluating a treatment technology. Should not be a RMP project.
Total Amount	$530,000	$382,000		

About the RMP

RMP ORIGIN AND PURPOSE

In 1992 the San Francisco Bay Regional Water Board passed Resolution No. 92-043 directing the Executive Officer to send a letter to regulated dischargers requiring them to implement a regional multi-media pollutant monitoring program for water quality (RMP) in San Francisco Bay. The Water Board's regulatory authority to require such a program comes from California Water Code Sections 13267, 13383, 13268 and 13385. The Water Board offered to suspend some effluent and local receiving water monitoring requirements for individual discharges to provide cost savings to implement baseline portions of the RMP, although they recognized that additional resources would be necessary. The Resolution also included a provision that the requirement for a RMP be included in discharger permits. The RMP began in 1993, and over ensuing years has been a successful and effective partnership of regulatory agencies and the regulated community.

The goal of the RMP is to collect data and communicate information about water quality in San Francisco Bay in support of management decisions.

This goal is achieved through a cooperative effort of a wide range of regulators, dischargers, scientists, and environmental advocates. This collaboration has fostered the development of a multifaceted, sophisticated, and efficient program that has demonstrated the capacity for considerable adaptation in response to changing management priorities and advances in scientific understanding.

RMP PLANNING

This collaboration and adaptation is achieved through the participation of stakeholders and scientists in frequent committee and workgroup meetings (see Organizational Chart, next page).

The annual planning cycle begins with a workshop in October in which the Steering Committee articulates general priorities among the information needs on water quality topics of concern. In the second quarter of the following year the workgroups and strategy teams forward recommendations for study plans to the Technical Review Committee (TRC). At their June meeting, the TRC combines all of this input into a study plan for the following year that is submitted to the Steering Committee. The Steering Committee then considers this recommendation and makes the final decision on the annual workplan.

In order to fulfill the overarching goal of the RMP, the Program has to be forward-thinking and anticipate what decisions are on the horizon, so that when their time comes, the scientific knowledge needed to inform the decisions is at hand. Consequently, each of the workgroups and teams develops five-year plans for studies to address the highest priority management questions for their subject area. Collectively, the efforts of all these groups represent a substantial body of deliberation and planning.

PURPOSE OF THIS DOCUMENT

The purpose of this document is to summarize the key discussion points and outcomes of a workgroup meeting.

Governance Structure for the
Regional Monitoring Program for Water Quality in San Francisco Bay

Steering Committee

San Francisco Bay Nutrient Management Strategy Committees

Technical Review Committee

Technical Review Committee

Emerging Contaminants Workgroup

Exposure and Effects Workgroup

Sources, Pathways, and Loadings Workgroup

PCB Workgroup

Selenium Workgroup

Dioxin Workgroup

Dioxin Workgroup

Sport Fish Strategy Team

Small Tributary Strategy Team

PCB Strategy Team

Mercury Strategy Team*

*currently inactive