Special Study Proposal:
Emerging Contaminants Strategy

Summary:

Increasing interest in emerging contaminants issues by the San Francisco Bay Regional Water Board, RMP stakeholders, and the general public is reflected in headline news as well as policy actions at local, state, and federal levels. The amount of effort needed to manage the RMP Emerging Contaminants Strategy has increased significantly in recent years. Core deliverables have been tracking new information regarding contaminant occurrence and toxicity and updating the RMP's Tiered Risk and Management Action Framework. New requests for information include assisting the Water Board with emerging contaminants action plans. Coordination of *pro bono* analyses by partners, such as BACWA and universities, is another rapidly expanding component of strategy implementation. A Bay-specific contaminant transport model will also be revised to incorporate better information on pathways, in response to a need for improved modeling capabilities identified by stakeholders and experts. Finally, an exploration of quantitative passive sampling capabilities has been identified as another near-term strategic goal. For these reasons, this proposal requests an increase in funding for managing the RMP Emerging Contaminants Strategy.

Estimated Cost: $50,000
Oversight Group: ECWG
Proposed by: Rebecca Sutton (SFEI)

PROPOSED DELIVERABLES AND TIMELINE

Deliverable	Due Date
Task 1. Information gathering from a variety of sources throughout the year, including presentations at scientific conferences	12/31/2017
Task 2. Assist Water Board and other stakeholders with science summaries relating to policy including emerging contaminants action plans and comment letters regarding proposed actions of other agencies	12/31/2017
Task 3. Present an update of emerging contaminants strategy, ongoing or completed special and pro bono studies, and new studies to the Steering Committee	12/31/2017
Task 4. Review tiered monitoring and management risk framework, present findings to the Water Board	12/31/2017
Task 5. Provide brief update to the RMP CEC Strategy document, including revised tiered framework tables and multi-year plan	12/31/2017
Task 6. Update existing Bay contaminant transport model with improved stormwater and runoff information	12/31/2017
Task 7. Inform experts and stakeholders regarding the practical application of quantitative passive sampling methods in estuarine settings	12/31/2016

Background

The science and management of contaminants of emerging concern (CECs) is an area of dynamic recent development. In 2015, the House and Senate both passed bills that would alter the primary legislation governing production and use of chemicals in the U.S., the federal Toxic Substances Control Act. While a single bill has not yet emerged from the reconciliation process, passage of legislation designed to modify a law that has been unchanged for 40 years is a clear sign of the growing concern surrounding the widespread introduction of thousands of chemicals into commerce without significant testing to establish safety for humans or wildlife. The general public has also become increasingly engaged on issues of chemical safety and potential ecological harm, informed by headlines in major newspapers across the country.

The RMP, a global leader on contaminants of emerging concern (CECs), stays ahead of the curve by identifying problem pollutants *before* they can harm wildlife. The RMP has completed a strategy document outlining a comprehensive, forward-looking approach to addressing CECs in San Francisco Bay (Sutton et al. 2013). The RMP's CECs strategy consists of three major elements. First, for contaminants known to occur in the Bay, the RMP evaluates relative risk using a Tiered Risk and Management Action Framework. This risk-based framework guides future monitoring proposals for each of these contaminants. The second element of the strategy involves review of scientific literature and other aquatic monitoring programs to identify new contaminants for which no Bay data yet exist. Finally, the third element of the strategy consists of non-targeted monitoring, including broadscan analyses and development of bioanalytical tools. In 2016, this strategy document will undergo a major revision to stay current with a wealth of recent scientific findings and management actions.

For the RMP CECs Strategy to remain relevant and timely, it needs annual updates with new information on analytical methods and study findings from the RMP and others. Funds are needed to review new results, track research conducted elsewhere, and keep stakeholders apprised of findings. Coordination of pro bono analyses is another rapidly expanding component of the strategy fund. At the same time, it is important for the RMP to provide relevant, objective science to inform the growing number of policy actions concerning emerging contaminants, an increasing demand on staff time.

In 2016, the RMP Steering Committee approved $33,000 for this strategy support task, recognizing especially the increased need for coordination of pro bono studies. An additional $15,000 was budgeted for revision of the strategy document, for a total of $48,000. With the potential for increased resources directed towards emerging contaminants in 2017, including specific deliverables regarding modeling and the exploration of new technologies (passive sampling), the recommended budget needed for managing the RMP CEC Strategy is $50,000. Additional budget details are provided in the following sections.

Study Objectives and Applicable RMP Management Questions

Table 1: Study objectives and questions relevant to RMP management questions

Management Question	Study Objective	Example Information Application
1) Are chemical concentrations in the Estuary at levels of potential concern and are associated impacts likely?	Compare existing occurrence data with new toxicity information reported in the scientific literature. Evaluate future monitoring needs and toxicity data gaps.	Does the latest science suggest a reprioritization of chemicals as we learn more about them? Which newly identified contaminants merit further monitoring?
2) What are the concentrations and masses of contaminants in the Estuary and its segments? 2.1 Are there particular regions of concern?	Does new knowledge including recently published toxicity data and/or source/pathway information suggest different relative risks for any of the five subembayments?	What are the key regional influences on different subembayments that impact concentrations, masses, and potential risk of emerging contaminants?
3) What are the sources, pathways, loadings, and processes leading to contaminant-related impacts in the Estuary? 3.1. Which sources, pathways, etc. contribute most to impacts?	Refine modeling capabilities through incorporation of improved data on pathways. Does new research in other regions provide insight as to key sources, pathways, loadings, and processes that affect impacts of emerging contaminants?	Are relative levels of contaminants in different matrices or subembayments consistent with our expectations for various contaminant processes?
4) Have the concentrations, masses, and associated impacts of contaminants in the Estuary increased or decreased? 4.1. What are the effects of management actions on concentrations and mass?	Does trend data from other regions suggest likely trends in the Bay? Which new management actions are likely to impact contaminant levels?	Are additional or different actions needed to reduce levels below aquatic toxicity thresholds?
5) What are the projected concentrations, masses, and associated impacts of contaminants in the Estuary?	Do data on production, use, and source trends in the scientific and trade literature provide a means of prioritizing relative risk of Bay contaminants?	Do production, use, and source trends suggest likely changes in the relative risk of specific emerging contaminants?

Emerging contaminants strategy work most directly addresses questions 1, 3, and 5, by assuring that all manner of relevant new information is brought to bear in evaluating the relative risk of emerging contaminants to Bay wildlife. For example, a new study identifying a lower toxicity threshold for a particular contaminant might suggest that the risk tier in which that contaminant had been placed should be revised.

In addition, the study will address the emerging contaminants priority question: What emerging contaminants have the potential to adversely impact beneficial uses of the Bay?

Approach

The emerging contaminants strategy funding supports the review of key information sources throughout the year. These sources include:

- Abstracts and newly published articles in key peer-reviewed journals (e.g., Environmental Science and Technology, Environmental Toxicology and Chemistry, Environment International)
- Documents produced by other programs (e.g., USEPA, Environment Canada, European Chemicals Agency, Great Lakes CEC Program)
- Abstracts and proceedings from relevant conferences (e.g., Society of Environmental Toxicology and Chemistry, International Symposium on Brominated Flame Retardants)

In addition, strategy funding allows staff to provide additional services, such as:

- Numerous presentations, briefings, and stakeholder interactions
- Scientific assistance to the Water Board as the agency prepares emerging contaminant action plans
- Scientific assistance to stakeholders engaged in emerging contaminants policy
- Coordination of pro bono analyses
- Improved modeling capabilities: The San Francisco Bay transport model will be updated with a four-fold increase in stormwater and runoff sources. Estimated flows from these 300+ watersheds will be based on a combination of an updated Regional Watershed Spreadsheet Model and USGS streamflow data. The model will then be used to predict the distribution in space and time of each watershed's contribution to the Bay waters, calculated across a full water year.
- Webinar or similar platform to inform stakeholders and experts as to the potential advantages and disadvantages associated with incorporating quantitative passive sampling methods into estuarine monitoring for emerging contaminants

The following table lists the specific tasks to be completed and their due dates.

Deliverable	Due Date
Task 1. Information gathering from a variety of sources throughout the year, including presentations at scientific conferences	12/31/2017
Task 2. Assist Water Board and other stakeholders with science summaries relating to policy including emerging contaminants action plans and comment letters regarding proposed actions of other agencies	12/31/2017
Task 3. Present an update of emerging contaminants strategy, ongoing or completed special and pro bono studies, and new studies to the Steering Committee	12/31/2017
Task 4. Review tiered monitoring and management risk framework, present	12/31/2017

findings to the Water Board	
Task 5. Provide brief update to the RMP CEC Strategy document, including revised tiered framework tables and multi-year plan	12/31/2017
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Budget

The following budget represents estimated costs for 2017 Emerging Contaminants Strategy.

Table 2. 2017 Emerging Contaminants Strategy budget

Deliverables	Budget
Tasks 1-7: Information gathering from a variety of sources throughout the year, including presentations at scientific conferences; Assist Water Board and other stakeholders with science summaries relating to policy including emerging contaminants action plans and comment letters regarding proposed actions of other agencies; Present an update of emerging contaminants strategy, ongoing or completed special and pro bono studies, and new studies to the Steering Committee; Review tiered monitoring and management risk framework, brief the Water Board; Provide brief update to the RMP CEC strategy document, including revised tiered framework tables and multi-year plan; Improve Bay contaminant transport models; Explore potential for quantitative passive sampling methods in estuarine settings	$50,000

Budget Justification

Funding for managing the CEC Strategy has traditionally covered updates to the Tiered Risk and Management Framework (element one of the RMP CEC strategy), review of the state of the science concerning CECs and interaction with other monitoring groups (element two), and interpretation of the findings of non-targeted analysis (element three) to determine new monitoring priorities.

Additional demands placed on the RMP's emerging contaminants team in recent years include: a) scientific assistance to the Water Board as agency staff prepare action plans for specific CECs; b) increased engagement with stakeholders (e.g., briefings for the Water Board and the RMP Steering Committee); c) scientific advisory support for the Water Board and other stakeholders concerning relevant policy proposals and actions at the local, state, and federal levels (e.g., USEPA proposed significant new use rules); d) increasing coordination of pro bono analyses that leverage RMP funds; and e) improved contaminant transport modeling capabilities. To assure that the RMP is able to provide cost-effective expertise to address these demands, this proposal requests a higher level of funding for 2017 to assure that the policies that are developed are based on sound science.

In 2016, the RMP Steering Committee approved $33,000 for this strategy support task, recognizing especially the increased need for coordination of pro bono studies. In 2017, we are requesting $50,000 in order to cover the new demands listed in the preceding paragraph. This increase in cost is justified by the cost to perform the work. For example, developing a single memo for the Water Board describing the state of science and policy for a particular contaminant for which an action plan is being developed may require 20 hours of senior staff time @ $150/hr, resulting in an expenditure of $3,000.

By providing funding for the emerging contaminants strategy, the RMP can be assured it is getting "the most bang for its buck," targeting the highest priority contaminants among the many thousands in commerce and potentially discharged to the Bay. The RMP is a global leader in CEC monitoring, yet it must be efficient and pragmatic in the face of finite resources. An increase in funding for this task will allow for strategic thinking using the latest science, so that the RMP can continue to generate the information water managers need to effectively address emerging contaminants in the Bay.

Reporting

A number of RMP CEC Strategy presentations (Emerging Contaminants Workgroup, Steering Committee, and Annual Meeting) and briefings (Water Board, others as needed) provide opportunities to report on this work. A brief update to the RMP CEC Strategy, including revised tiered framework tables and multi-year plan, represents another key reporting mechanism for the RMP.

References

Sutton R, Sedlak M, Davis J. 2013. Contaminants of Emerging Concern in San Francisco Bay: A Strategy for Future Investigations. SFEI Contribution 700. San Francisco Estuary Institute, Richmond, CA. http://www.sfei.org/documents/contaminants-emerging-concern-san-francisco-bay-strategy-future-investigations