



Delta RMP Technical Advisory Committee Meeting

Wednesday, March 30th, 2016; 1:30 pm – 4:00pm

*Sacramento Regional County Sanitation District,
10060 Goethe Road, Sacramento, CA 95827
Sunset Maple Room*

Call-In Number: 415.655.0381
Attendee access code: 943-326-397#
<https://join.me/sfei-conf-cw1>

DRAFT Agenda

1	<p>Introductions and Agenda Review and agree on agenda and desired outcomes</p>		1:30 Stephen McCord
2	<p>Approve Draft TAC Meeting Summary (November 16, 2015)</p>	DRAFT TAC meeting summary	1:35 Stephen McCord
3	<p>SC Updates Staff and TAC co-Chairs will</p> <ul style="list-style-type: none"> • Summarize the outcomes of the 12/18/15 SC Meeting and recent SC decisions • Outline input that TAC needs to give to SC for the 4/25/16 SC meeting <p><u>Desired Outcome:</u> Informed TAC regarding SC decisions and activities.</p>	<p>Draft SC Meeting Summary</p> <p>Delta RMP Decision Record</p>	1:40 Joe Domagalski Stephen McCord Meg Sedlak
4	<p>Review of Key Findings and Recommendations from Recently Completed Nutrient Work Products</p> <p>Lead authors of the Delta RMP-funded Sensor Data Synthesis and the DWR-funded Synthesis of EMP Data, Stable Isotope, and DSM2 Nutrient Models will provide short overviews of key findings from recent reports, followed by a brief Q&A.</p> <p><u>Desired Outcome:</u> Review of draft USGS report and DWR report; TAC feedback on USGS report. Provide background information for discussion of workplan elements.</p>	<p>USGS report</p> <p>http://sfbaynutrients.sfei.org/books/dwr-contract-deliverable</p>	1:45 Brian Bergamaschi and Dave Senn



<p>5</p>	<p>Recommendations for FY16/17 Workplan: Pesticides, Mercury, Nutrients, and Pathogens</p> <p>The subcommittees for nutrients, mercury, pathogens, and pesticides have developed recommendations for elements to be included in the workplan.</p> <p><u>Desired Outcome:</u> TAC to provide prioritized recommendations to the SC for elements to include in the workplan.</p>	<p>Proposals for nutrients, pathogens, and mercury</p>	<p>2:25 Thomas Jabusch Meg Sedlak</p>
<p>6</p>	<p>Pesticides: Risk Potential and Prioritization</p> <p>The purpose of this agenda item is to initiate the development of two related items:</p> <ol style="list-style-type: none"> 1. Definition of "(highest) risk potential". The SC asked for more insight on the recommended edit to the pesticides assessment question "...or with the highest risk potential". 2. Prioritization of pesticides for monitoring/annual review and updating of the list of analytes. The prioritization process will need to be in place by fall, to guide the TAC review of the list of analytes for FY 17/18. <p><u>Desired Outcome:</u> Initial TAC feedback; convene a subcommittee to further develop a draft recommendation for the TAC</p>		<p>3:15 Thomas Jabusch</p>
<p>7</p>	<p>Updates and wrap-up</p> <ul style="list-style-type: none"> • Status of Power Analyses (SFCWA) and External Review (Delta Science Program) • Updates on recent sampling and analyses • Central Valley Pyrethroids TMDL • DRMP poster at IEP workshop • Capture TAC recommendations and action items • Address "parking lot" items, as time permits • Confirm next two TAC meeting dates and locations as well as agenda items (Possible dates for June – 14th, 15th, 16th (preference for Wed); Sept. 14th, 15th, 16th (again preference for Wed)) 		<p>3:40 Stephen McCord Joe Domagalski Meg Sedlak Danny McClure</p>
<p>8</p>	<p>Adjourn</p>		<p>4:00</p>

Record of Decision for the Delta RMP Steering Committee

Number	Date	Decision	Meeting Summary Link	Type	Yes	No	Abstain
2015-1	01/22/15	The Steering Committee provisionally approved the Monitoring Design, for purposes of proceeding to implement the workplan for the remainder of fiscal year 14/15.	FINAL	Consensus			
2015-2	01/22/15	The Steering Committee accepted the recommendation from the TAC to use <i>Hyaella</i> for water toxicity testing but asked the TAC to provide additional technical information about evaluating and interpreting the data.	FINAL	Consensus			
2015-3	01/22/15	The Steering Committee approved the fiscal year 14-15 workplan for nutrients, specifically the allocation of \$35,000 to the startup of the high frequency data analysis, with the understanding that this work element will be completed in fiscal year 15/16. The Steering Committee requested that a sole-source justification for the USGS contract be prepared and added to the workplan. The Steering Committee generally agreed that there was sufficient justification to contract with USGS on a sole source basis due to the USGS' unique expertise, specialized experience, and access to unpublished sensor data.	FINAL	Consensus			
2015-4	01/22/15	The Steering Committee approved the FY14–15 workplan for pathogens, with the understanding that this work element will be completed in FY15–16. The Steering Committee requested a more formal sole-source justification for the pathogen labs in the workplan.	FINAL	Consensus			
2015-5	01/22/15	The Steering Committee approved the FY14–15 workplan for pesticides and toxicity, with the understanding that this work element will be completed in the subsequent fiscal year and with the budget will be reduced by \$4,500 since a RFP process for field sample collection will not be needed. The Steering Committee requested that sole-source justifications for the USGS lab contract and ATL toxicity contract be prepared and added to the workplan. The Steering Committee generally agreed that there was sufficient justification to contract with USGS on a sole source basis due to the USGS' unique technical capability to monitor a large list of pesticides. The Steering Committee generally agreed that there was sufficient justification to contract with ATL on a sole source basis due to the existing SWAMP contract with ATL for these services, which will allow the Delta RMP to access \$200,000 in SWAMP funds.	FINAL	Consensus			
2015-6	01/22/15	The Steering Committee agreed that toxicity testing continue to be conducted by ATL at least through the FY15-16, because of the negative impacts of switching laboratories in the middle of a sampling season.	FINAL	Consensus			
2015-7	01/22/15	The Steering Committee agreed that the full design for pesticide/toxicity monitoring should be implemented for 3 months in fiscal year 14/15 even though funding to implement that design in fiscal year 15/16 may not be authorized.	FINAL	Consensus			
2015-8	01/22/15	The Steering Committee agreed that ASC may contract the field sampling element of the pesticide/toxicity workplan without an RFP process because of the small size of the contract.	FINAL	Consensus			
2015-9	01/22/15	The Steering Committee agreed that the relative allocation of effort among program elements (e.g., nutrients, pesticides, mercury, and pathogens) and all program costs will be revisited as part of discussion of the FY 15-16 workplan.	FINAL	Consensus			
2015-10	01/22/15	The Steering Committee approved the FY 14-15 budget for administration, governance, and communications.	FINAL	Consensus			
2015-11	01/22/15	ASC shall implement appropriate funding mechanisms (e.g., invoice, contract) as needed to meet the needs of different Delta RMP members.	FINAL	Consensus			
2015-12	03/27/15	An update on the status of agenda items should be part of the agenda for future meetings.	FINAL	Consensus			
2015-13	03/27/15	Reports from the TAC to the SC should clearly specify which recommendations were made by consensus and lay out issues and pros/cons that were discussed.	FINAL	Consensus			
2015-14	03/27/15	Toxicity testing using <i>Hyaella</i> will not be included in the FY14/15 monitoring. The funding that would have been used for FY14/15 monitoring will be diverted to the SCCWRP interlaboratory comparability study if ATL needs funding to participate. The Delta RMP will collect field samples for the interlaboratory comparability study if needed.	FINAL	VOTE	10	0	0
2015-15	03/27/15	Any additional comments on the Monitoring Design should be submitted by adding them to the Response to Comments matrix prepared by ASC.	FINAL	Consensus			
2015-16	03/27/15	The date, time, and agenda for all SC and TAC meetings should be publicly noticed when these meetings are scheduled.	FINAL	Consensus			
2015-17	03/27/15	The FY14/15 Workplan, as amended during the meeting, was approved.	FINAL	VOTE	9	0	1
2015-18	03/27/15	The Delta RMP "Financial Management Plan", as amended by the SC, was approved.	FINAL	VOTE	8	0	2
2015-19	03/27/15	Stephen McCord and Joe Domagalski should continue as TAC Co-Chairs until June 30, 2015. Stephen McCord will be paid by Regional San.	FINAL	VOTE	10	0	0

Record of Decision for the Delta RMP Steering Committee

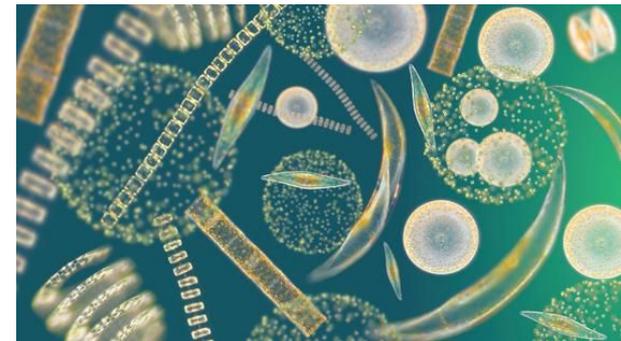
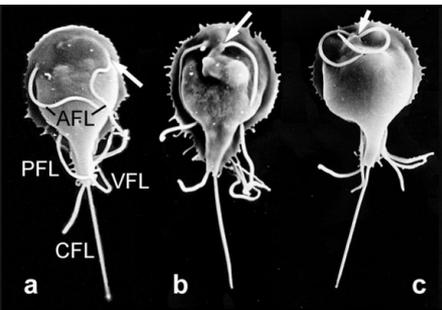
Number	Date	Decision	Meeting Summary Link	Type	Yes	No	Abstain
2015-20	03/27/15	The Delta RMP "Committee Roles" document as presented at the 3/27/15 meeting was approved.	FINAL	VOTE	9	0	1
2015-21	06/16/15	January and March summaries as amended approved.	FINAL	VOTE	10	0	0
2015-22	06/16/15	The agenda package for the Steering Committee should be posted on the Regional Board's Delta RMP website in advance of the meeting with the except of draft meeting summaries, which will be emailed to the Steering Committee directly. The Regional Board's website will have a note saying that "Draft meeting summaries are available upon request from the Regional Board".	FINAL	Consensus			
2015-23	06/16/15	TAC TIE subcommittee members are confirmed for the duration of the FY15/16 workplan; their term is to end in June 2016.	FINAL	Consensus			
2015-24	06/16/15	Approve the Monitoring Design dated 6/7/2015 as amended at the 6/16/15 meeting.	FINAL	VOTE	10	0	0
2015-25	06/16/15	Approve the FY15/16 Budget and Workplan as proposed, with the understanding that there will be a check-in before the second six-months of the fiscal year and that additional nutrient studies will be moved the top of the list for studies to be completed when additional funds are available.	FINAL	VOTE	10	0	0
2015-26	06/16/15	The Steering Committee approves sending the completed QAPP as soon as possible to the SWAMP Quality Assurance Officer for review and beginning pesticide/toxicity monitoring immediately upon SWAMP approval of the toxicity portion of the QAPP.	FINAL	VOTE	8	0	2
2015-27	07/22/15	Approve FY15/16 detailed workplan as amended with minor comments.	(over email)	VOTE	7	0	0
2015-28	10/23/15	Add a second seat for Agriculture to the Steering Committee.	FINAL	VOTE	10	0	0
2015-29	10/23/15	Approve minutes from June 16, 2015, as amended.	FINAL	VOTE	10	0	1
2015-30	10/23/15	Establish a Finance Subcommittee to review Program budgets and look for cost savings that could be implemented in the next workplan. The committee will have one representative each from water supply, agriculture, wastewater, and stormwater.	FINAL	VOTE	11	0	0
2015-31	10/23/15	Establish a Revenue Subcommittee to identify new sources of funding for the Program, especially grants. The committee will consist of Val Connor, Linda Dorn, and Gregg Erickson.	FINAL	VOTE	11	0	0
2015-32	10/23/15	The Steering Committee endorsed the outline for the Delta RMP Foundations document (consensus).	FINAL	Consensus			
2015-33	12/18/15	The SC agreed in general that prioritizing pesticides for monitoring is a good idea but would like the TAC to provide more details about how "risk potential" would be determined.	DRAFT	Consensus			
2015-34	12/18/15	The budget for FY16/17 is \$948,000. This target increases the contributions from each Participant Group by 2.5% from FY15/16 to keep up with inflation. The target does not include the \$100,000 that may be contributed by SFCWA.	DRAFT	VOTE	6	2	1
2015-35	12/18/15	Accept offer from NMFS to have Melanie Okoro (Primary) and Jeff Stuart (Alternate) fill the vacant seat for Resource Agencies.	DRAFT	Consensus			
2015-36	12/18/15	Add two new seats to the Steering Committee: one for the State Water Board and one for stormwater agencies. Greg Gearhart will fill the seat for the State Board. Someone to represent medium to smaller Phase II municipal agencies will fill the new stormwater seat.	DRAFT	Consensus			
2015-37	12/18/15	Approve meeting summary from October 23, 2015, without changes.	DRAFT	Consensus			
2015-38	12/18/15	Approve Communications Plan as amended at the December 18, 2015, meeting.	DRAFT	VOTE	10	0	1
2015-39	12/18/15	Approve Program Planning Overview as amended at the December 18, 2015, meeting.	DRAFT	VOTE	9	0	2
2015-40	12/18/15	Approved revised workplan for FY15/16 Nutrient Synthesis task	DRAFT	Consensus			



TAC

Slides for Agenda Item #5 Recommendations for FY16/17 Workplan: Pesticides, Mercury, Nutrients, and Pathogens

March 30, 2016

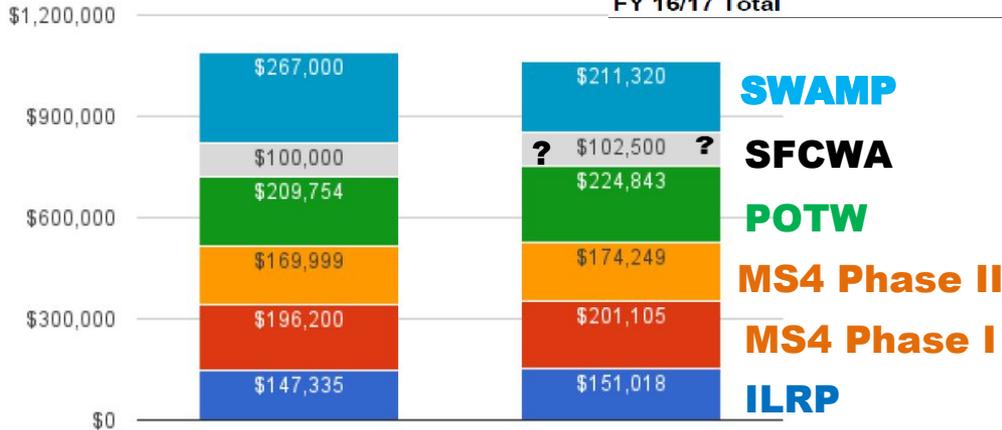


Process for Developing FY16/17 Workplan

- Dec. '15: SC set the total revenue target for FY16/17
- Jan-Feb '16: TAC subcommittees developed proposals for FY16/17
- Mar. '16: TAC reviews proposals/recommends studies to SC
- Apr. '16: SC approves suite of studies as part of FY16/17 workplan

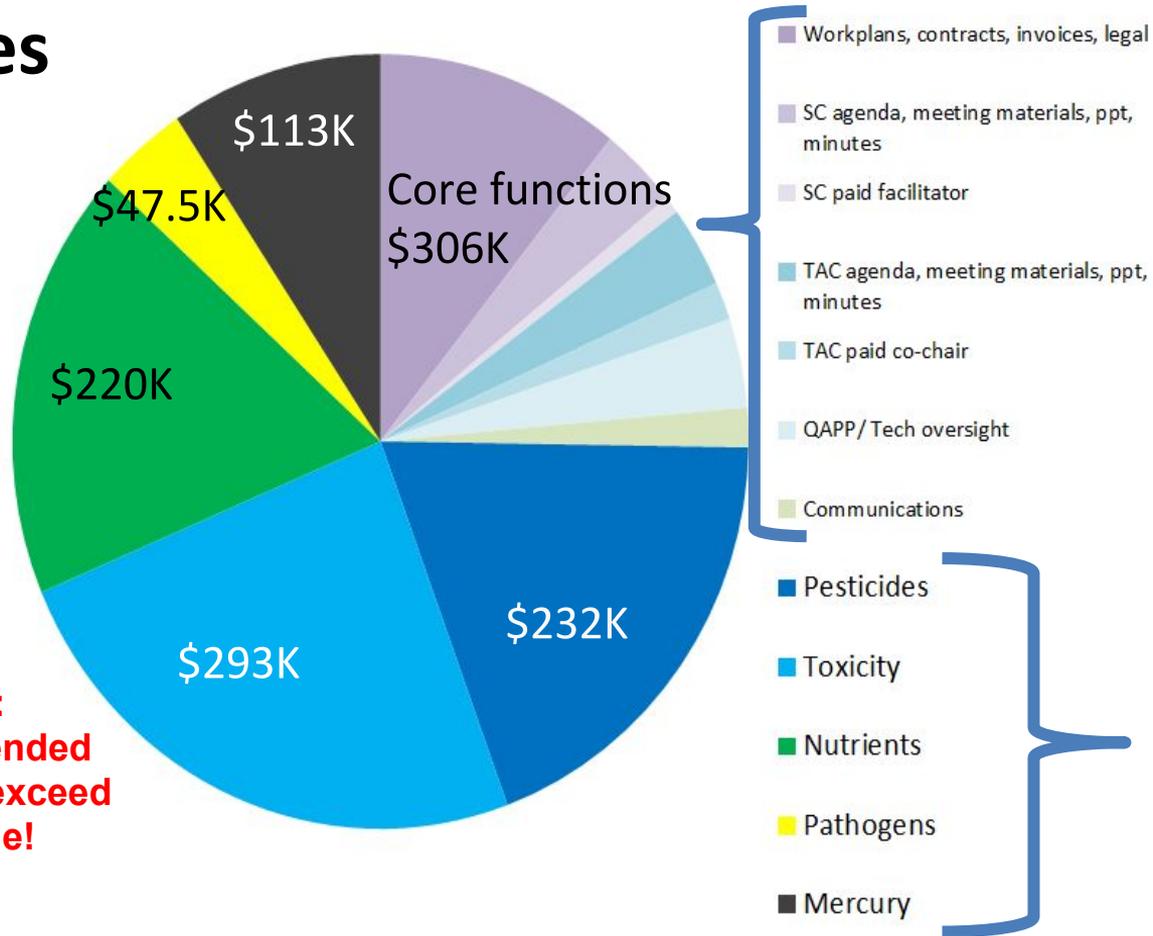
Revenue

			Expected	Received	Grand Total
FY 15/16	Contribution	ILRP	\$33,555	\$113,780	\$147,335
		MS4 Phase 1	\$38,000	\$158,200	\$196,200
		MS4 Phase 2		\$169,999	\$169,999
		POTW		\$209,754	\$209,754
		SFCWA	\$100,000		\$100,000
	In-Kind Service	RB5		\$267,000	\$267,000
FY 15/16 Total			\$171,555	\$918,733	\$1,090,288
FY 16/17	Contribution	ILRP	\$151,018		\$151,018
		MS4 Phase 1	\$201,105		\$201,105
		MS4 Phase 2	\$174,249		\$174,249
		POTW	\$224,843		\$224,843
		SFCWA	\$102,500		\$102,500
	In-Kind Service	RB5		\$211,320	\$211,320
FY 16/17 Total			\$853,715	\$211,320	\$1,065,035



Revenue FY15/16 versus FY16/17

Subcommittee Recommended Expenses



Note:
Recommended expenses exceed revenue!

Special Studies
\$906K

Revenue vs Recommended Expenses

- Total Revenue - \$1,065,036
 - Minimum revenue –\$962,536
- Total Recom'd Expense \$1,212,275
- Projected Deficit **-\$147,239**

- Projected Special Studies budget: \$906K; \$759K available

Cannot fund all recommended studies
Need to prioritize studies for FY16/17

Prioritizing Studies

Criteria for Prioritizing:

1. Level of priority given by subcommittees
2. Does the project address multiple Delta RMP priorities?
3. Stay the course on on-going multi-year studies (e.g. pesticides)

Based on above, ASC recommends:

Option A if all revenue received; Option B if there is a \$103K shortfall
(options presented on next slide with details in subsequent slides)

Recommended Options

Option A – No shortfall
(*\$759K available*)

CUP Monitoring - \$526K

- Year 2 Pest/Tox - \$491K
- Pest. Prioritization - \$15K
- Reporting -\$20K

Nutrients Synthesis - \$120K

Mercury - \$113K

Total = \$759K

Option B – 103K Shortfall
(*\$657K available*)

CUP Monitoring - \$526K

- Year 2 - \$491K
- Prioritization - \$15K
- Reporting -\$20K

Nutrients Synthesis - \$120K

Total = \$646K

Current Use Pesticides



A. Pesticides Year Two

Summary: CUP subcommittee recommended to stay the course (i.e. conduct YR 2 of monitoring design). Contractors: USGS & AHPL

Proposed Cost: \$526K

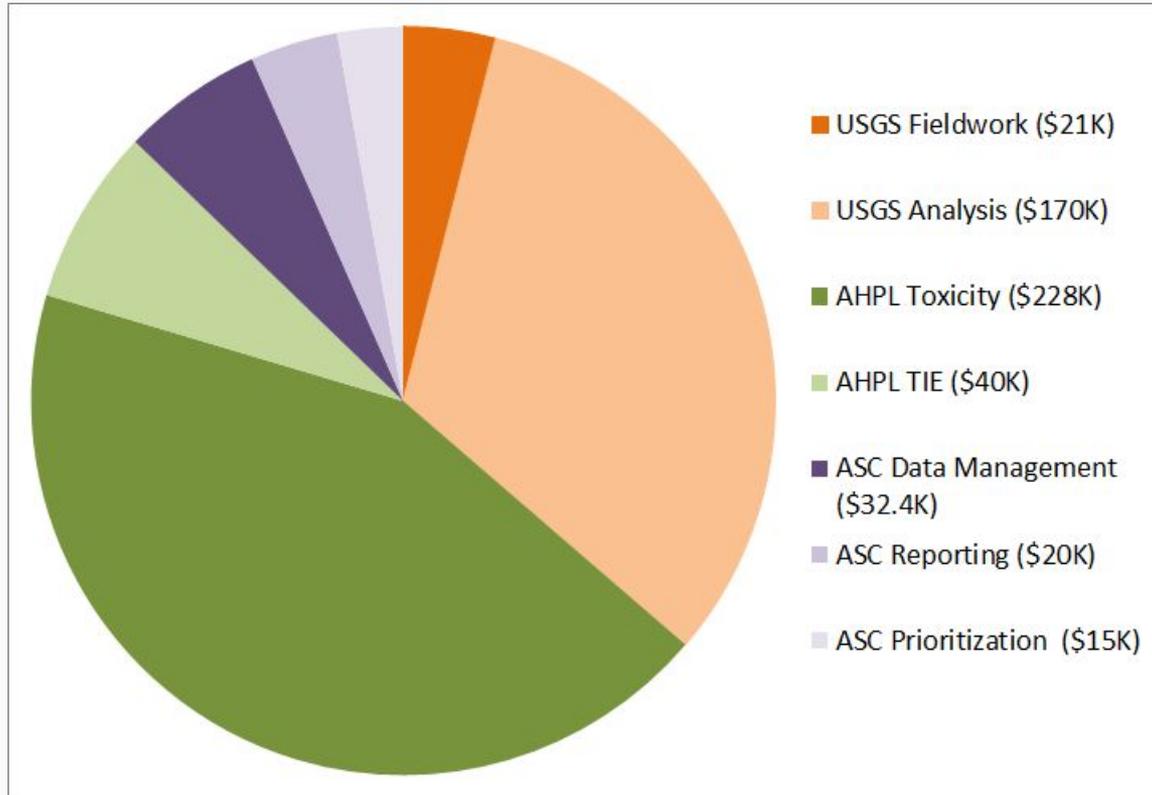
Assessment Questions: S&T 1 & 2– Spatial and temporal variability and the extent to which they contribute to toxicity; baseline conditions.

Pros/Cons: (+) Addresses need to key Delta RMP needs / (-) A significant portion of the RMP budget.

Outputs/Outcomes: Completion of 2-year monitoring study by July '17. Final data by March '18. Synthesis report in FY17/18 budget.

Source: Delta RMP Monitoring Design for CUPs

Current Use Pesticides (\$526K)



Current Use Pesticides



B. Develop prioritization process and evaluate list

Summary: Develop and implement a prioritization process for updating the list of pesticide target analytes. The proposed activity covers the technical work and convening the subcommittee for multiple meetings.

Proposed Cost: \$15K

Assessment Questions: S&T 2.1– Which pesticides have the highest risk potential (based on DPR's risk prioritization model) and should be included in chemical analyses?

Pros/Cons: (+) Changes might be premature and make it difficult to detect trends / (-) Not considered as part of study cost in the approved monitoring design.

Outputs/Outcomes: Prioritization process; updated list of target analytes.

Future Considerations - Pesticides/Toxicity

- Re-evaluate costs for FY17/18
 - Refine analyte list?
 - Consider alternative laboratories (e.g., pesticides, toxicity, WQ parameters), different subs for field sampling



Mercury



A. Implement updated design for mercury monitoring

Summary: 1) Annual fish sampling at 6 fixed sites (bass only); 2) quarterly water sampling at 5 fixed sites. Contractor: MLML

Proposed Cost: \$113K (includes data mgmt, summary memorandum with synthesis report in FY17/18)

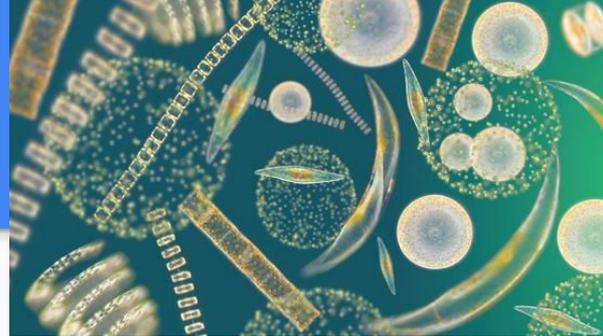
Assessment Questions: S&T 1. (A, B) - Trends over time in MeHg in sportfish and water

Pros/Cons: (+) Opportunity to begin implementation /(-) Requires 10-yr (fish sampling) and 5-yr (water sampling) commitments to data collection.

Outputs/Outcomes: Year 1 implementation of study design.

Source: Updated Monitoring Design for Mercury (Mercury Subcommittee, 03-14-16)

Nutrients



A. Synthesis of existing data and models

Summary: 1) Basic synthesis report (update IEP-EMP data synthesis with recent years and additional constituents); 2) additional more rigorous statistical analyses of the data (trends, monitoring network efficacy); 3) additional modeling tasks and synthesis of modeling results (residence times, biogeochemical and hydrological connectedness, monitoring network design). Proposed contractors: ASC, RMA.

Proposed Cost: \$120K

Assessment Questions: S&T 1 (A,B,C) – Spatial and temporal variability; SPLP1 - loads and transformations

Pros/Cons: (+) Synthesizing, assessing, and reporting on existing data that are currently underutilized is a valuable contribution; efficient use of RMP funds / (-) Does not acquire new field data filling critical gaps.

Outputs/Outcomes: Technical report evaluating data relative to DRMP S&T questions.

Nutrients

B. HF Mapping

Summary: 2 data collection cruises (~4 days each) in two different flow/export conditions (~4 days for each flow scenario), one in the fall, when river flows are at a minimum and when phytoplankton blooms historically occur, and one in spring, during higher flows and higher exports. Measurements include: NO_3 , NH_4 , PO_4 , DO, chl-a, SC, particle size, temperature, and BGA pigments. Locations for the HF mapping would be determined through modeling work done for the synthesis task. Subcontractor: USGS

Estimated cost: \$100K

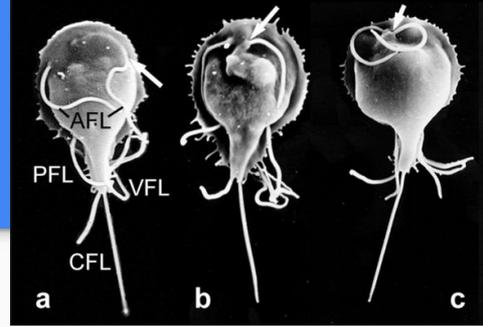
Assessment Questions: S&T 1 (A, B)

Pros/Cons: (+) Large spatial coverage, (-) Minimal temporal coverage

Outputs/Outcomes: (1) Data report (2) Filling critical data gaps for subregions and/or habitats that are currently under-monitored, and (3) Providing guidance for long-term DRMP nutrient monitoring design



Pathogens



A. “Trigger Study”

Summary: If Basin Plan trigger level thresholds are exceeded, perform follow-up monitoring to characterize source contributions for *Cryptosporidium* and *Giardia*

Cost: \$47,250. - These funds would be used only if necessary to perform trigger follow-up monitoring (details to be determined). It is recommended that Reserve funds could be accessed if necessary.

Assessment Questions: SPLP 2 - potential sources.

Pros/Cons: (+) Need to understand causes of possible future exceedances /(-) Specific trigger study activities are not immediately necessary.

Outputs/Outcomes: Source evaluation, if needed.

Source: Delta RMP Monitoring Design for Pathogens, Pathogen Study Year 2 Recommendations (Pathogen Subcommittee)

Recommended Options

Option A – No shortfall
(*\$759K available*)

CUP Monitoring - \$526K

- Year 2 Pest/Tox - \$491K
- Pest. Prioritization - \$15K
- Reporting -\$20K

Nutrients Synthesis - \$120K

Mercury - \$113K

Total = \$759K

Option B – 103K Shortfall
(*\$657K available*)

CUP Monitoring - \$526K

- Year 2 - \$491K
- Prioritization - \$15K
- Reporting -\$20K

Nutrients Synthesis - \$120K

Total = \$646K

Monitoring Design Summary – Mercury

1.1.1 Initial Assessment Questions

- S&T 1. What are the status and trends in ambient concentrations of total mercury and methylmercury in fish, water, and sediment, particularly in subareas likely to be affected by major existing or new sources (e.g., large-scale restoration projects)?
- A. Are trends over time in methylmercury in **sport fish** similar or different among Delta subareas?
 - B. Are trends over time in methylmercury in **water** similar or different among Delta subareas?

The monitoring design focuses on the two bolded elements.

Fish Sampling

- ⇒ Indicator of primary interest is methylmercury in muscle fillet of 350 mm largemouth bass (or similar predator species), derived through analysis of 11 individual bass or predator fish at each location. Methylmercury in muscle fillets of other TL3 and TL4 species are Indicators of secondary interest.
- ⇒ An interpretive report on the fish and water mercury monitoring will be prepared after three years of data collection.

Design	<i>6 fixed sites, bass only</i>
Frequency	Annual
Schedule	Monitor for 10 years and then re-evaluate. Sample in summer or early fall.
Co-location	<ul style="list-style-type: none"> – Water Hg (selected sites) – Other water parameters (selected sites)
Coordination	DWR, USGS (sampling of flow monitoring stations)
Annual Cost	\$45,344
In Kind Funds	\$8,262
Annual Cost to DRMP	\$37,082

Water Sampling

- ⇒ Indicator of primary interest is total (unfiltered) methylmercury (based on the TMDL).
- ⇒ Other analytes included in this scope: filtered methylmercury, filtered total mercury, unfiltered total mercury, suspended solids, chlorophyll a, dissolved organic carbon (field filtered), volatile suspended solids. Field measurements will include dissolved oxygen, pH, and specific conductance.
- ⇒ Other important ancillary parameters: nutrients (ALK, NH3, CL, DOC, HARD, NO3/NO2, N (total), OPO4, TPPOS, SiO2, SO4, SSC, TDS, TOC), grain size. Budget assumes these are covered by other funds.
- ⇒ An interpretive report on the fish and water mercury monitoring will be prepared after three years of data collection.

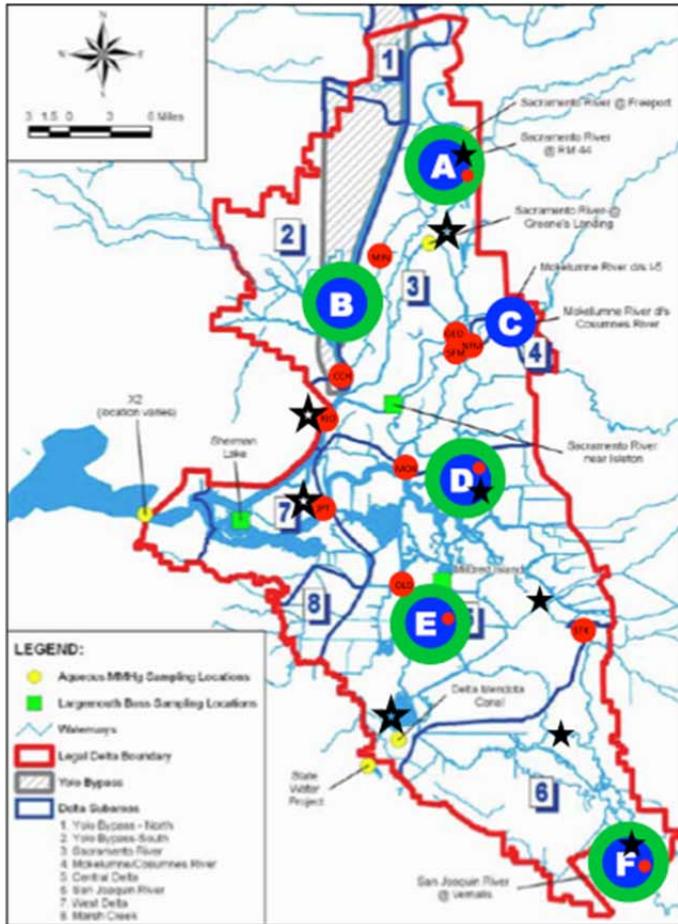
Design	<i>5 fixed sites</i>
Frequency	Quarterly
Schedule	Monitor for 5 years and then re-evaluate
Co-location	<ul style="list-style-type: none"> – Sport fish sampling – Other water parameters
Coordination	DWR, USGS (sampling of flow monitoring stations)
Annual Cost	\$65,310
In Kind Funds	\$12,392
Annual Cost to DRMP	\$52,918

Costs for SFEI tasks

- Data management, QA review: \$15,000
- Oversight and coordination: \$3,000

TOTAL ANNUAL COST TO DRMP OF 2016 MERCURY MONITORING: \$108,000

Monitoring Sites



Proposed Sites for Mercury Sampling

- Proposed Fish Sites J
- Proposed Water Sites ●
- DWR/USGS Flux Sites ● ●
- Permittee Proposed Sites ★ ★

A	Sacramento R @ RM44 (resolve RM44 vs Freeport vs Hood)
B	Liberty Island
C	Mokelumne R ds Cosumnes R
D	Little Potato Slough
E	MID flux station (close to Middle R at Hwy 4 fish station)
F	San Joaquin R @ Vernalis

Liberty Island: The site would be in the channel. In the winter, depending on the degree of flooding, either Prospect Slough or Ryer Island would be suggested sampling points



To: Delta RMP Nutrient Subcommittee

From: Philip Trowbridge, Thomas Jabusch, and Meg Sedlak

Re: Recommendations for highest priority nutrient monitoring tasks that could begin in FY16/17

Date: February 17th, 2016

Recommendation from February 3rd, 2016, Delta RMP Nutrient Subcommittee Meeting

The subcommittee recommended that a nutrient proposal for FY 2016/2017 that includes two elements: synthesis of existing data and models; and high frequency (HF) mapping. The synthesis work in conjunction with modeling was regarded as essential.

Synthesis of Existing Data and Models (\$120K)

Synthesis of existing data is a high priority as it is a core mission of the Delta RMP. A wealth of Delta monitoring data is being produced by many agencies (e.g., IEP- EMP, USGS, MWQ, etc.) yet there is a dearth of synthesis and evaluation. Data synthesis is an opportunity and no regrets opportunity to maximize what can be learned from existing data relative to Delta RMP assessment questions, and to inform future monitoring program design. The synthesis will be guided by the Delta RMP assessment questions and will identify monitoring data gaps relative to the Delta RMP assessment questions.

The recommended tasks are:

1. Basic synthesis report. This effort will consist of updating the DWR report with the more recent data (2011 onwards) for N species and will qualitatively discuss and compare recent data with those of prior years. The synthesis will be expanded to include important constituents such as phosphorus, chlorophyll, and dissolved oxygen that were not examined in detail in the prior DWR report.
2. Additional more rigorous statistical analyses of the data (such as weighted regression approaches and general additive models) to:
 - a. Better characterize spatial, seasonal, and long-term trends within a holistic statistical modeling framework, and, to the extent possible, resolve the effects of natural and anthropogenic drivers on ecosystem response, and

- b. Evaluate the efficacy of current long-term water quality monitoring networks in providing the data necessary to understand water quality conditions and dynamics in the Delta relative to the RMP assessment questions.
3. Additional modeling tasks and synthesis of modeling results. DMS2-based modeling (used in the recent DWR report) will be augmented with simulated particle tracking or tracer studies. The objectives will be to:
 - a. Provide information on residence times (or water “age”) and biogeochemical and hydrological connectedness of Delta subregions and/or habitat types,
 - b. Make recommendations for monitoring station placement and frequency to fill critical gaps in current monitoring system, and
 - c. Use modeling observations to inform HF mapping locations, if funded.

The total proposed cost for these activities is \$120K, with an approximate cost breakdown as follows: Task 1 ~\$30K; Task 3 ~\$30K; Task 2 ~60K, although the actual cost of Task 2 will depend on what is learned through Task 1.

The nutrient subcommittee noted the strong interrelationship between modeling and monitoring and the importance of both activities to inform an optimum monitoring design to answer nutrient management questions. The subcommittee endorsed the particle tracking modeling work by Marianne Guerin at RMA that identifies resident times. Resident times can be a proxy for water quality and can be used to quantify transformation rates occurring in the Delta. In addition, modeling may help identify the need for new fixed stations and the redundancy of others.

High Frequency (HF) Mapping (\$100K)

HF mapping is also very valuable for modeling and monitoring. The detailed temporal and spatial data acquired from HF mapping is at a time scale that is critical for model calibration and validation. It also may characterize areas that are currently not represented in the design (e.g., back sloughs) as well as capture short term events that are missed with longer-term fixed monitoring. HF mapping can assist in the optimization of the design of fixed monitoring station locations.

HF mapping was suggested to document the variability of nutrients and related water quality parameters at high spatial resolution in the North Delta, Central Delta, and the Western Delta out to Suisun Bay. Measurements will include nitrate, ammonium, phosphate, temperature, conductivity, dissolved oxygen, chlorophyll, blue-green algal pigments, particle size and others. Data-collection cruises will be conducted in two different flow/export conditions (~4 days for each flow scenario), one in the fall, when river flows are at a minimum and when phytoplankton blooms historically occur, and one in spring, during higher flows and higher exports.

The total estimated cost for this task is \$125K. The total cost to the Delta RMP will be \$100K. USGS will provide \$25K in matching funds.

Additional proposals were discussed but not ranked as highly. These included:

- Cyanotoxin measurements
- Phytoplankton pigment analysis
- NH₄ sensor development
- Improved HAB sensors
- Isotope analyses
- Aerial mapping of macrophytes

Optional Add On Task: Cyanotoxin Analysis

Cyanotoxin monitoring received more support as a possible add-on task in comparison to other proposals that were not prioritized. The proposed approach would be to analyze cyanotoxins in clam samples. The 2016 Generalized Random Tessellation Stratified (GRTS) benthic survey would provide a unique piggybacking opportunity. The subcommittee also suggested waiting until an on-going USGS study of cyanotoxins in clams in the northern portion of San Francisco Bay is completed. An additional factor affecting the decision not to prioritize cyanotoxin analyses in FY16/17 was the assumption that clam samples would be archived for later analysis. However, post-meeting follow-up revealed that the benthic samples collected in 2016 would not be archived, unless this is specifically requested of DWR and they agree. *Question to Nutrient Subcommittee: does that circumstance change your decision?*

Comments on Deferment of Cyanotoxin, Pigments, and Mapping of Macrophytes

While the subcommittee found the options present on these topics relevant and important, they felt that they were not “no regret” options at this time for the Delta RMP.

Some subcommittee members raised concern that the nexus between nutrient management and algal pigments, cyanotoxin, and macrophytes has not been firmly established. That is, it is not clear that nutrient management will appreciably change the occurrence of cyanobacteria, macrophyte blooms, or changes in phytoplankton community composition. The committee noted however, that nutrient cycling is impacted by macrophyte growth and that HF mapping may be appropriate at some future date to assess changes in nutrient concentrations during the growth period. It was also noted that there are no comprehensive monitoring surveys of macrophytes.

Sensor Development

There was no consensus that the RMP should have a role in sensor development. However, an improved NH₄ sensor could be of value to the Delta RMP by filling in critical data gaps concerning the temporal variability of NH₄ concentrations.

Pathogen Study Year No. 2 Recommendations¹

The Monitoring Design Summary² describes the two year pathogen monitoring study developed by the Central Valley Drinking Water Policy Workgroup (Workgroup) in coordination with the Delta RMP. The study coordinates water agency intake sample collection for the Long Term 2 Enhanced Surface Water Treatment Rule (LT2) between April 2015 and April 2017 with ambient sample collection. The Delta RMP collects the ambient samples at twelve locations by the Municipal Water Quality Investigations (MWQI) section of the Department of Water Resources (DWR), with funding from the Delta RMP for analytical services and in-kind contributions from Workgroup members to oversee sample collection and data assessment. All monitoring sites are shown in Figure 1. The Workgroup performed an assessment of the data to-date, and prepared recommendations for Year No. 2.³

REVIEW OF YEAR NO. 1 (APRIL 2015 – MARCH 2016) DATA

The Workgroup reviewed the Year No. 1 data to-date (10 months, from April 2015 through January 2016), including all available LT2 Delta water intake data and ambient data collected by the Delta RMP for *Cryptosporidium* and *Giardia*, which are summarized in Table 1 through Table 4 as provisional data for Delta RMP use only. These data confirm that Basin Plan trigger values for *Cryptosporidium* have not been exceeded at the drinking water intakes during the first part of the study, which included several widespread storm events. The ambient data collected by the Delta RMP supports this finding, though the trigger values are only applicable at the water intake locations.

While some matrix spike levels reported were lower than is typical for analytical chemistry (see Table 5), the analytical laboratory ongoing precision recovery (OPR) values are within acceptable ranges, and the data are considered usable based on LT2 evaluation criteria. The Workgroup, following a review period by the Delta RMP Technical Advisory Committee (TAC), modified quality control sample collection and sample collection during July 2015 and August 2015 because of a known nationwide analytical method reagent supply quality issue that was subsequently resolved.⁴ The evaluation determined that both the primary and secondary analytical labs performed similarly

¹ Prepared by Hope Taylor and Brian Laurensen, Larry Walker Associates on behalf of the Central Valley Drinking Water Policy Workgroup.

² Delta Regional Monitoring Program. *Monitoring Design Summary*. Prepared for Delta RMP Steering Committee. November 3, 2014. Revised June 16, 2015

³ February 23, 2016 meeting of Workgroup

⁴ Brian Laurensen and Hope Taylor, Larry Walker Associates. *Temporary Variance to Delta Regional Monitoring Program Pathogen Monitoring Schedule to Evaluate Reagent Supply and Method Performance*. August 4, 2015 email to Phil Trowbridge, Aquatic Science Center

for matrix spike recoveries and that LT2-allowed method modifications intended to improve *Cryptosporidium* matrix recovery did not improve performance.

RECOMMENDATIONS FOR YEAR NO. 2 (APRIL 2016 - MARCH 2017) SAMPLE COLLECTION

Because no trigger values were identified in Year No. 1 to date and there were no consistent detections of *Cryptosporidium*, the Workgroup determined that specific trigger study activities were not immediately necessary. However, future data may trigger additional study to characterize potential sources if a Basin Plan trigger value is observed.

Based on the Monitoring Design Summary and the findings from Year No. 1, the Workgroup recommends that the Delta RMP proceed as follows to satisfy the intent of the Basin Plan Monitoring and Surveillance program:

1. Continue monthly monitoring at the twelve ambient locations according to the Monitoring and Design Summary mid-range level-of-effort (\$72,000). MWQI received DWR approval of the ongoing additional effort to collect the samples for Year No. 2. Any additional increase in level-of-effort would require additional approval.
2. Request \$47,250 for the Year No. 2 “trigger study” according to the Monitoring and Design Summary. These funds would be used only if necessary to perform trigger follow-up monitoring in coordination with the monthly monitoring. The Monitoring Design Summary specified several possible tools that could be used. These tools and updated unit costs are provided below.

Trigger Follow-up Tool	Description	Quantified Value	Unit Cost
Source monitoring	Collected by sources (e.g., stormwater, POTWs)	<i>Cryptosporidium</i> and <i>Giardia</i> concentration to characterize source contributions	\$340/sample
Microbial source tracking (MST)	Polymerase chain reaction (PCR) to detect and quantify specific nucleic acid sequences from intestinal bacteria (<i>Bacteroidales</i>)	Origin of the bacteria as percentage in sample (e.g., gull, cow/horse, dog, human sources) and associated pathogenic organisms concentrations	\$1075/sample with four strains
Infectivity	A <i>Cryptosporidium</i> cell culture method is used to determine the viability (ability to infect) of the cysts present in the sample. If no cysts are present, the assessment is not possible.	Infectivity (growth) rate differences between samples	\$475/sample
Hydrodynamic fingerprinting	Determine the contributing sources of flow volume to the point of sample collection as in-kind contribution. No additional sample collection necessary.	Monthly time-step fingerprinting (volumetric percent contributions from upstream tributaries) at key locations and compilation of flow information at time of sample	Not Applicable. In-kind task

collection. Estimate fraction of flow from controllable sources.

It is expected that any study, if necessary, would be performed at four to six sites for four to six events. The trigger study would be designed to follow-up on an expected or observed trigger value. While trigger studies could be performed after Year No. 2, the “lost opportunity” cost would likely include the extension of project administration costs and additional sample collection at four to six ambient locations and intakes (approximately \$20,000 to \$25,000).

3. Request the ability for the Workgroup to make as-needed modifications to the quality control and environmental sample collection schedules to perform the trigger studies or to address matrix recovery issues, other data quality or logistical issues that are identified during Year No. 2 of the study. Proposed changes would first be discussed with Aquatic Science Center staff who would make a determination of whether the change was significant enough to require supplemental documentation prepared by the Workgroup and notification and/or review by the Technical Advisory Committee and the Steering Committee. Any modifications would be funded by “not-to-exceed” trigger study funding or through modification of the monthly monitoring schedule of activities. This process would be followed for any special study work recommended by the Workgroup.

REPORTING APPROACH

The Basin Plan specifies that a final study report should be prepared. The Workgroup recommends that a data report be prepared through in-kind contributions from Workgroup participants, likely at the end of FY1617 or during FY1718. The data report would generally report the results, assess the trigger values, and prepare data visualizations as indicated in the Monitoring Design Summary to best address the Delta RMP assessment questions ST1 and SPLP1. The remaining assessment questions may only be addressed if a trigger study is implemented.

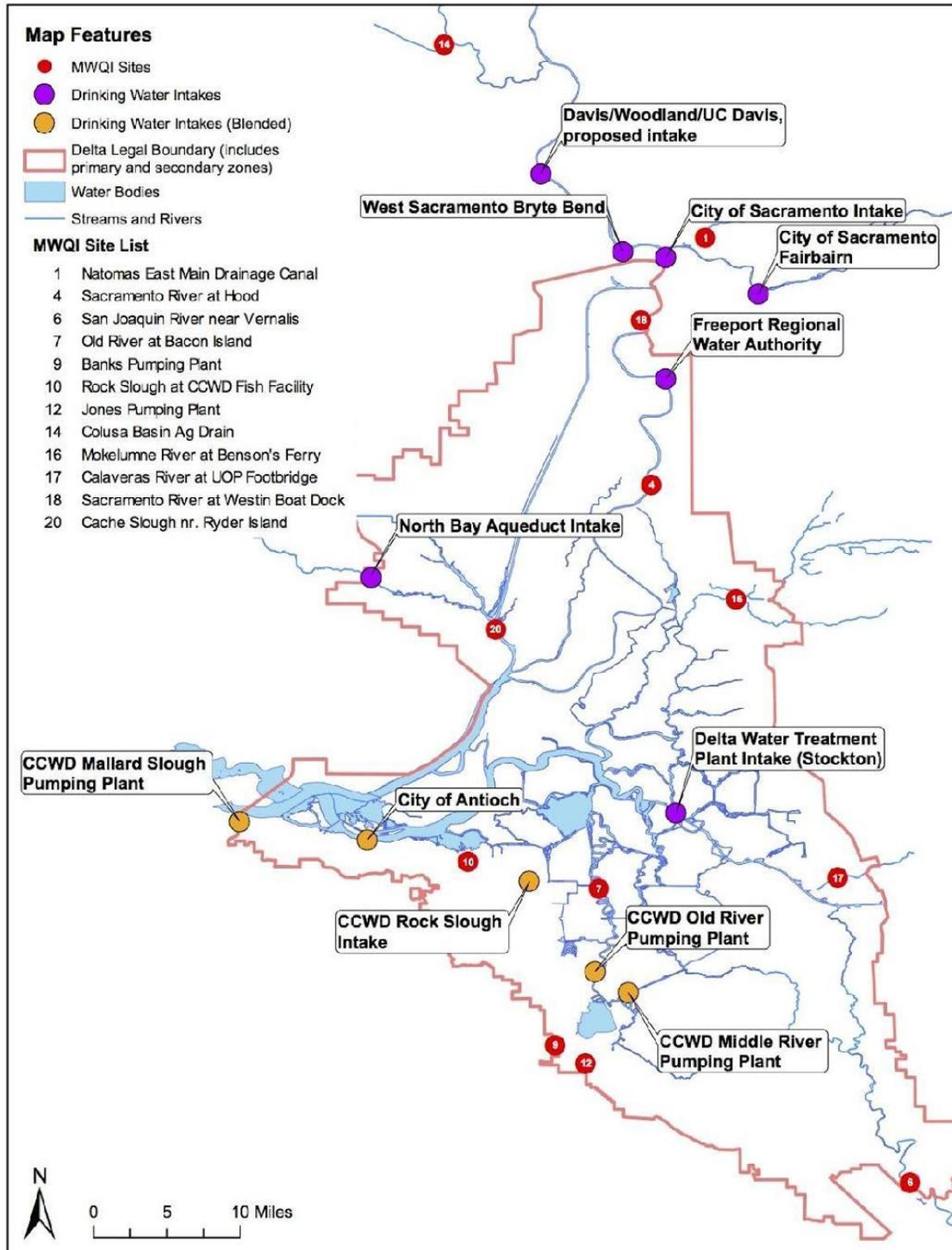


Figure 1. Water Intake, Raw Source, and Ambient (MWQI) Sampling Sites

Table 1. Preliminary Drinking Water Intake Monitoring Results for *Cryptosporidium* (oocysts/L) [Preliminary data for internal distribution - do not cite]

Location ID	Description	Source(s) Represented	Rationale for Inclusion	2015										2016	Average
				April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.		
West Sacramento - Bryte Bend WTP	Sacramento River	Drinking water intake	Upstream of Sacramento urban area	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.1	0
Sacramento – Fairbairn WTP	American River	Drinking water intake	In Sacramento urban area	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0
Sacramento – Sacramento WTP	Sacramento River	Drinking water intake	In Sacramento urban area	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	0.02
EBMUD – Freeport Intake	Sacramento River	Drinking water intake	Downstream of Sacramento urban area	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	NA	0.022
Solano Irrigation District – North Bay Aqueduct	Barker Slough	Drinking water intake	North Delta water with some local watershed runoff in wet season	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.14	0.02
Stockton – Delta WTP	San Joaquin River	Drinking water intake	In eastern Delta	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CCWD – Randall Bold WTP	Western Delta/Los Vaqueros Reservoir	Drinking water intake	In western Delta	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0
Zone 7 Water Agency – Patterson Pass WTP	South Bay Aqueduct	Drinking water intake	100% Delta water in South Bay Aqueduct	Lab failed QC. Resampled in May	<0.08	<0.08	<0.07	<0.07	<0.07	<0.08	Not sampled	Not sampled	Not sampled	Not sampled	0

SCVWD – Penitencia WTP	South Bay Aqueduct	Drinking water intake	Blend of South Bay Aqueduct and Lake Del Valle	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0
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Notes: NS = not sampled; NA = not available

Table 2. Preliminary Drinking Water Intake Monitoring Results for *Giardia* (cysts/L) [Preliminary data for internal distribution - do not cite]

Location ID	Description	Source(s) Represented	Rationale for Inclusion	2015										2016	Average
				April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.		
West Sacramento - Bryte Bend WTP	Sacramento River	Drinking water intake	Upstream of Sacramento urban area	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<0.1	0
Sacramento – Fairbairn WTP	American River	Drinking water intake	In Sacramento urban area	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	NA	NA	NA	NA	NA	0.017
Sacramento – Sacramento WTP	Sacramento River	Drinking water intake	In Sacramento urban area	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	NA	NA	NA	NA	NA	0.017
EBMUD – Freeport Intake	Sacramento River	Drinking water intake	Downstream of Sacramento urban area	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	NA	NA	NA	NA	0
Solano Irrigation District – North Bay Aqueduct	Barker Slough	Drinking water intake	North Delta water with some local watershed runoff in wet season	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA
Stockton – Delta WTP	San Joaquin River	Drinking water intake	In eastern Delta	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CCWD – Randall Bold	Western Delta/Los Vaqueros	Drinking water intake	In western Delta	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

WTP	Reservoir													
Zone 7 Water Agency – Patterson Pass WTP	South Bay Aqueduct	Drinking water intake	100% Delta water in South Bay Aqueduct	NA	NA									
SCVWD – Penitencia WTP	South Bay Aqueduct	Drinking water intake	Blend of South Bay Aqueduct and Lake Del Valle	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0

Notes: NS = not sampled; NA = not available

Table 3. Preliminary Ambient monitoring Results for *Cryptosporidium* (oocysts/L) [Preliminary data for internal distribution - do not cite]

Location ID	Description	Source(s) Represented	Rationale for Inclusion	2015												2016	Average
				April		May		June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.		
MWQI #14	Colusa Basin Ag Drain	Agriculture	Source representation	<0.1	<0.1	<0.1	<0.1	NS	NS	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0	
MWQI #1	Natomas East Main Drainage Canal	Stormwater, Agriculture	Source representation	<0.1	<0.1	<0.1	<0.1	NS	NS	0.1	<0.1	0.1	<0.1	<0.1	<0.1	0.025	
MWQI #18	Sacramento River at Westin Boat Dock	Stormwater, Combined Sewer System	Proximity to intakes	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0	
MWQI #4	Sacramento River at Hood	Stormwater, Wastewater	General characterization	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.01	
MWQI #20	Cache Slough near Ryder Island	Wetlands	Source Representation	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NS	<0.1	<0.1	<0.1	0	
MWQI #16	Mokelumne River at Benson's Ferry		Input to Delta	<0.1	<0.1	<0.1	NS	NS	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0	
MWQI #17	Calaveras River at UOP Footbridge	Stormwater	Source representation	<0.1	<0.1	<0.1	NS	NS	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	0.0125	
MWQI #10	Rock Slough at CCWD Fish Facility		General characterization	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0	
MWQI #7	Old River at Bacon Island		General characterization	<0.1	<0.1	<0.1	NS	NS	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0	
MWQI #9	Banks Pumping Plant		Export from Delta	<0.1	<0.1	<0.1	NS	NS	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0	
MWQI #12	Jones Pumping		Export from	<0.1	<0.1	<0.1	NS	NS	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0	

	Plant		Delta												
MWQI #6	San Joaquin River near Vernalis		Input to Delta	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.01

Notes: NS = not sampled; NA = not available

Table 4. Preliminary Ambient Monitoring Results for *Giardia* (cysts/L) [Preliminary data for internal distribution - do not cite]

Location ID	Description	Source(s) Represented	Rationale for Inclusion	2015												2016	Average
				April		May		June		July	Aug.	Sept.		Oct.	Nov.	Dec.	
MWQI #14	Colusa Basin Ag Drain	Agriculture	Source representation	<0.1	<0.1	<0.1	<0.1	NS	NS	<0.1	<0.1	0.1	0.9	1.2	0.15		
MWQI #1	Natomas East Main Drainage Canal	Stormwater, Agriculture	Source representation	<0.1	0.4	0.3	0.3	NS	NS	21.5	5.8	7.9	5.9	0.4	5.27		
MWQI #18	Sacramento River at Westin Boat Dock	Stormwater, Combined Sewer System	Proximity to intakes	0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	20.3	2.05		
MWQI #4	Sacramento River at Hood	Stormwater, Wastewater	General characterization	<0.1	0.6	<0.1	<0.1	0.2	0.1	<0.1	<0.1	<0.1	0.8	0.4	0.2		
MWQI #20	Cache Slough near Ryder Island	Wetlands	Source Representation	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NS	<0.1	<0.1	0		
MWQI #16	Mokelumne River at Benson's Ferry		Input to Delta	<0.1	<0.1	<0.1	NS	NS	0.3	0.3	<0.1	0.1	0.6	<0.1	0.11		
MWQI #17	Calaveras River at UOP Footbridge	Stormwater	Source representation	0.4	<0.1	<0.1	NS	NS	<0.1	<0.1	<0.1	<0.1	0.1	0.1	0.075		

MWQI #10	Rock Slough at CCWD Fish Facility		General characterization	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0
MWQI #7	Old River at Bacon Island		General characterization	0.1	<0.1	<0.1	NS	NS	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	0.025
MWQI #9	Banks Pumping Plant		Export from Delta	<0.1	<0.1	<0.1	NS	NS	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0
MWQI #12	Jones Pumping Plant		Export from Delta	<0.1	<0.1	<0.1	NS	NS	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	0.013
MWQI #6	San Joaquin River near Vernalis		Input to Delta	0.2	<0.1	0.5	0.1	0.9	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	0.18

Notes: NS = not sampled; NA = not available

Table 5. Ambient Monitoring - Matrix Spike Recovery and Laboratory Ongoing Precision and Recovery (OPR) Percentages [Preliminary data for internal distribution - do not cite]

Year	Month	Method	MS Sample Location	MS Recovery		OPR Recovery	
				<i>Cryptosporidium</i>	<i>Giardia</i>	<i>Cryptosporidium</i>	<i>Giardia</i>
2015	April	1623	Colusa Basin Ag Drain	1%	1%	69%	62%
	May	1623	Natomas East Main Drainage Canal	0%	3%	22%	66%
	June	1623	Sacramento River at Westin Boat Dock	27%	1%	54%	84%
	July	1623	Sacramento River at Westin Boat Dock	0%	11%	53%	69%
		1623	Sacramento River at Hood	1%	15%	53%	69%
		1623.1	Sacramento River at Hood	0%	11%	68%	55%
	August	1623	Sacramento River at Hood	11%	74%	79%	90%
		1623	San Joaquin River near Vernalis	17%	72%	79%	90%
		1623.1	San Joaquin River near Vernalis	21%	64%	72%	81%
		1623 by Eurofins	San Joaquin River near Vernalis	32%	71%	57%	47%
	September	1623	Mokelumne River at Benson's Ferry	32%	87%	82%	80%
	October	1623	Calaveras River at UOP Footbridge	41%	70%	77%	81%
November	1623	Rock Slough @ CCWD Fish Facility	76%	83%	71%	86%	
December	1623	Old River at Bacon Island	76%	81%	74%	85%	
2016	January	1623	Banks Pumping Plant	1%	20%	75%	71%

How is the definition of “Risk potential” relevant to Delta RMP decisions

Two Different Issues

- a. How to prioritize pesticides for monitoring?
- b. How to evaluate results?

“Risk potential” Definition from the Approved Monitoring Design

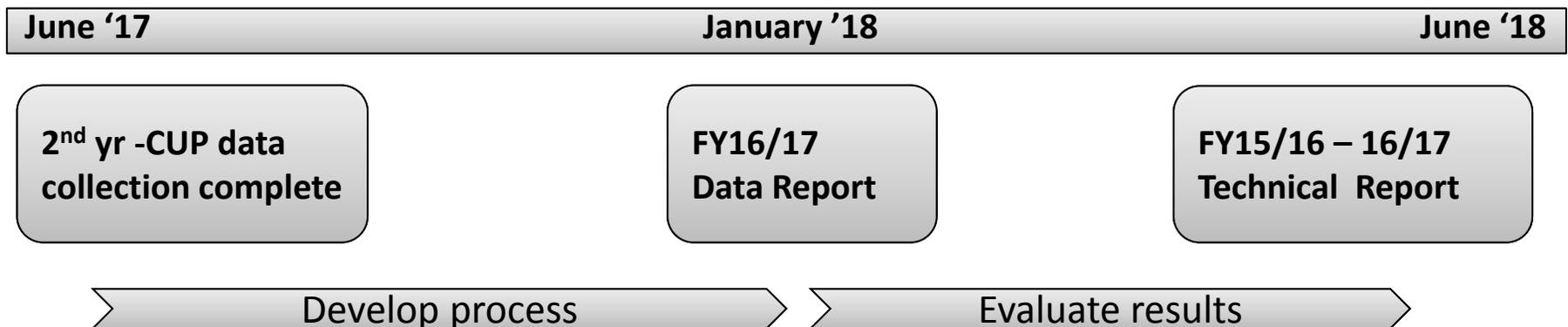
⇒ already have an *existing* definition in monitoring design, need to communicate to SC :

“S&T 2.1. Which pesticides have the highest risk potential (based on DPR’s risk prioritization model) and should be included in chemical analyses?”

Proposed Process for Evaluating Delta RMP Results

How to evaluate results?

Developing this process is not urgent. It will not be implemented until after FY16/17 when the first two years of pesticide monitoring are synthesized.



Delta Science Program – Project Plan

Project Title: Review of the Delta Regional Monitoring Program (Delta RMP) Monitoring Design

Background and Purpose

The Delta RMP was initiated by the Central Valley Regional Water Quality Control Board (Regional Water Board) with the primary goal of tracking and documenting the effectiveness of beneficial use protection and restoration efforts through comprehensive monitoring of water quality constituents and their effects in the Delta. The Delta RMP is an identified priority in the State Water Resource Control Board's and Central Valley Water Board's Delta Strategic Plan, and in USEPA's 2012 San Francisco Bay Delta Action Plan. In addition, the Delta RMP is recommended in the Delta Plan adopted by the Delta Stewardship Council. The development of the Delta RMP was initially prompted by the collapse of the populations of several species of fish in the early 2000s, an event that triggered new inquiries into the potential role of contaminants in what is now termed the Pelagic Organism Decline (POD). However, these inquiries more broadly highlighted shortcomings of existing monitoring efforts to address questions at the scale of the Delta.

In addition, the Delta RMP reflects an increasing desire among water quality and resource managers throughout the state for more integrated information about patterns and trends in ambient conditions across watersheds and regions. Moreover, many stressors on beneficial uses are interrelated and must be addressed more holistically (see <http://deltacouncil.ca.gov/docs/delta-challenges>). The Delta RMP can be seen as a complement to existing larger-scale collaborative monitoring efforts throughout the state that attempt to address questions and concerns about regional conditions and trends (e.g., San Francisco Bay RMP, Southern California Bight Monitoring Program, Surface Water Ambient Monitoring Program).

A stakeholder process resulted in agreements on the goals and objectives of the Delta RMP and a Management Questions Framework to guide monitoring and assessment at the regional scale. Work to date has also helped to identify the initial program priorities (current use pesticides, mercury, nutrients, and a pathogens special study). A Monitoring Design for the Program was approved in June 2015 and monitoring for 2 of the 4 priority areas began that same year.

The purpose of this review is to provide an independent and objective assessment of the current Monitoring Design.

Statement of Work

The Delta Science Program, following its "Policy and Procedures for Independent Scientific Review" will work with a subcommittee of Delta RMP Steering Committee and Technical Advisory Committee representatives (the Review Planning Workgroup) to plan and implement an independent science review to provide comment and advice on the scientific quality of the Delta RMP Monitoring Design. The DSP will lead one or more planning meetings to:

1. Develop a charge to the panel that will provide the structure for its review. This charge will define the scope of the review and will include the specific questions for the panel.
2. Identify appropriate independent science experts to conduct the review.
3. Identify compile, and provide materials to the panel.
4. Plan for communications about the review process and results

The independent science experts will be asked to:

1. Read and review the Monitoring Design.
2. Participate in a panel meeting via a teleconference with the Delta Science Program to initiate the review and clarify any questions, which will include a presentation by Delta RMP staff to provide context for the current Monitoring Design and stakeholder expectations.
3. Prepare an initial review report with findings and recommendations.
4. After the Delta RMP Steering Committee has prepared a response to the initial review within 6 months, the panel will review and respond to the Steering Committee's comments and issue a final review report.

Each panelist will assist in conceptualizing, writing and editing the review reports by responding to questions identified in the charge. In addition, one panelist will be appointed by the DSP as the Chair/Lead Author. The Chair/Lead Author's role is to develop the structure of the review report, assemble individual panelist's contributions and format and edit the initial and final review report.

Upon completion, the review report will be provided to the Delta RMP and will be posted on the Delta Science Program website.

Materials for Review

1. Delta RMP Monitoring Design and appendices (approved 6/16/15)

Supplemental Documents

1. Delta RMP Guiding Principles
2. Delta RMP Committee Roles

Scope of Review (These questions establish the boundaries for the scope of the review. The actual review questions will be developed by the Delta Science Program in consultation with the Review Planning Workgroup)

1. The Delta RMP's management questions and assessment questions reflect the information needs of the Program. The Monitoring Design contains plans for data collection and studies to address these questions. Are the target parameters and monitoring design (for lower, recommended, and higher levels of effort) adequate to answer the questions in a time frame appropriate for the management questions?

2. The Delta RMP is completing its first year of monitoring. There is not enough revenue to fully implement the Monitoring Design. With limited funding, what scientific criteria (e.g., the effect of the frequency of monitoring on statistical power, etc.) should the Program consider when deciding how to distribute limited resources?

Review Panel Membership

Desired Expertise:

- Monitoring design, statistical methods, power analysis
- Sacramento-San Joaquin Delta science/system
- Complex, large-scale water quality contaminant monitoring (especially for pesticides, toxicity, nutrients, pathogens, and mercury)

Proposed Schedule

Start: April 2016

Initial Report: September 2016

Final Report: December 2016

Deliverables

1. List of panelists and expertise
2. Charge to the panel
3. Teleconference meeting between panelists and the Delta Science Program
4. Initial and final reports addressing charge questions

Delta Science Program Staff Lead

Estimated Budget

<u>Independent Science Review</u>	<u>Hours</u>	<u>Rate</u>	<u>Number of Reviewers</u>	<u>Amount (\$)</u>

Funding Source

Delta Science Program

DRAFT

Delta RMP Deliverables Scorecard Report

Key to Status Colors:

Green indicates greater than 90 days until the deliverable is due.

Yellow indicates a deliverable due within 90 days.

Red indicates a deliverable that is overdue.

Project	Primary	Deliverable	Assigned To	Due Date	Status	Comments
Delta RMP (FY14/15)	Pathogens Monitoring	Set up contracts with BioVir and Eurofins	Thomas Jabusch	04/06/15	Complete	
Delta RMP (FY14/15)	Data Management	Prepare QAPP for FY14/15	Thomas Jabusch	04/15/15	Complete	QAPP completed and sent to SWAMP QAO for review.
Delta RMP (FY14/15)	Pesticide/Toxicity Monitoring	Set up contract with USGS for pesticide analyses	Thomas Jabusch	04/30/15	Complete	
Delta RMP (FY14/15)	Pesticide/Toxicity Monitoring	Arrange for UCD/ATL to participate in SCCWRP Interlaboratory Calibration Study	Thomas Jabusch	04/30/15	Complete	APHL will participate in the study without funding from the Delta RMP.
Delta RMP (FY14/15)	Nutrient Synthesis	Set up contract with USGS for synthesis of high-frequency sensor data	Thomas Jabusch	05/15/15	Complete	
Delta RMP (FY14/15)	Program Management	Revised Monitoring Design	Thomas Jabusch	05/22/15	Complete	The Monitoring Design has been revised and was sent to the TAC and SC on 6/8/15 for review.
Delta RMP (FY14/15)	Program Management	FY15-16 Annual Program Workplan	Philip Trowbridge	05/22/15	Complete	FY15/16 Budget and Workplan sent to SC on 6/9/15.
Delta RMP (FY14/15)	Program Management	Framework for Interpretation of Monitoring Results	Thomas Jabusch	05/22/15	Complete	An outline for the Communications Plan was included in the revised Monitoring Design sent on 6/8/15 and will be discussed at the 6/16/15 SC meeting.
Delta RMP (FY14/15)	Program Management	FY15/16 Revenue Projections and Plan for Efficiently Invoicing Participants	Philip Trowbridge	05/22/15	Complete	
Delta RMP (FY14/15)	Program Management	Quarterly financial reports	Lawrence Leung	05/31/15	Complete	
Delta RMP (FY14/15)	Program Management	System for tracking deliverables and action items	Philip Trowbridge	05/31/15	Complete	For June SC meeting
Delta RMP (FY14/15)	Data Management	Set up templates and EDD reports for the pesticide/toxicity and pathogen laboratories	Amy Franz	05/31/15	Complete	EDDs for pathogens labs have been created. EDDs for pesticide/toxicity labs has been deferred to FY15/16.
Delta RMP (FY14/15)	Pesticide/Toxicity Monitoring	Collect two rounds of samples and analyze the samples for pesticides and toxicity	Contractors	06/30/15	Complete	This task has been deferred to FY15/16 workplan.
Delta RMP (FY14/15)	Nutrient Synthesis	Final report on high-frequency sensor data nutrient synthesis	Brian Bergamashi	12/31/15		
Delta RMP (FY14/15)	Pathogens Monitoring	Pathogens Year 1 Final report	Contractors	06/30/16		
Delta RMP (FY15/16)	Program Management	Supplemental Budget Request to analyze split samples for CUPs	Thomas Jabusch	08/31/15	Complete	
Delta RMP (FY15/16)	Program Management	Prop 1 Application	Jennifer Sun	09/16/15	Complete	An application for 2 years of mercury monitoring (\$640k) was submitted in response to the DFW solicitation.

Project	Primary	Deliverable	Assigned To	Due Date	Status	Comments
Delta RMP (FY15/16)	Governance	TAC Meeting #1 and Summary	Thomas Jabusch	09/30/15	Complete	
Delta RMP (FY15/16)	Communications	Communications Plan	Thomas Jabusch	09/30/15	Complete	The draft Communications Plan and Program Planning Outline were sent to the TAC on 9/17/15 and the Steering Committee on 10/15/15.
Delta RMP (FY15/16)	Governance	Steering Committee Meeting #1 and Summary	Philip Trowbridge	10/30/15	Complete	
Delta RMP (FY15/16)	Governance	TAC Meeting #2 and Summary	Thomas Jabusch	12/31/15	Complete	
Delta RMP (FY15/16)	Governance	Steering Committee Meeting #2 and Summary	Philip Trowbridge	01/31/16	Complete	
Delta RMP (FY15/16)	Communications	Communications Product	Meg Sedlak	01/31/16		Draft distributed at 12/18/15 SC meeting. Will be discussed at April SC meeting.
Delta RMP (FY15/16)	Program Management	MOU for financial management and invoicing	Philip Trowbridge	03/31/16		
Delta RMP (FY15/16)	Governance	TAC Meeting #3 and Summary	Thomas Jabusch	03/31/16		
Delta RMP (FY15/16)	Governance	Steering Committee Meeting #3 and Summary	Philip Trowbridge	04/29/16		
Delta RMP (FY15/16)	Nutrients Synthesis	Nutrient Monitoring Design Synthesis Report	Thomas Jabusch	04/30/16		A draft of the report will be prepared by April 30, 2016 so that the recommendations can be considered for funding in the FY16/17 Workplan. The final report will be completed by June 30, 2016.
Delta RMP (FY15/16)	Program Management	FY16/17 Annual Workplan and Budget	Philip Trowbridge	05/13/16		Draft in May 2016. Final by June 30, 2016.
Delta RMP (FY15/16)	Governance	Steering Committee Meeting #4 and Summary	Philip Trowbridge	06/30/16		
Delta RMP (FY15/16)	Governance	TAC Meeting #4 and Summary	Thomas Jabusch	06/30/16		
Delta RMP (FY15/16)	Quality Assurance	QAPP Update	Thomas Jabusch	06/30/16		Original QAPP still being reviewed by SWAMP and SB QAO. Updates to the QAPP will be added after FY16/17 work program is developed.
Delta RMP (FY15/16)	Pathogens Study	Data Management of Year 1 Pathogens Data	Amy Franz	07/31/16		Data from BioVir and Eurofins. Formatting, transcribing field collection information, performing QA/QC review, and uploading field and analytical results to SFEI's RDC database and replicating to CEDEN.
Delta RMP (FY15/16)	Pathogens Study	Quality Assurance Report on Year 1 Pathogens Data	Don Yee	09/30/16		QAO report. Funded from Data Management budget.
Delta RMP (FY15/16)	CUP Monitoring	Field Sampling Report for FY15/16 CUP Monitoring	Thomas Jabusch	09/30/16		
Delta RMP (FY15/16)	CUP Monitoring	Data Management of FY15/16 CUP Data	Amy Franz	12/31/16		Pesticide, toxicity, copper, carbon, SSC. Labs: USGS and UCD and a second pesticide lab to be named later.
Delta RMP (FY15/16)	CUP Monitoring	Quality Assurance Report for FY15/16 CUP Monitoring	Don Yee	12/31/16		QAO report. Funded from Data Management budget.
Delta RMP (FY15/16)	CUP Monitoring	Annual Monitoring Report for FY15/16 CUP Monitoring	Thomas Jabusch	02/28/17		
Delta RMP (FY15/16)	Pathogens Study	Data Management of Year 2 Pathogens Data	Amy Franz	07/31/17		Data from BioVir and Eurofins. Formatting, transcribing field collection information, performing QA/QC review, and uploading field and analytical results to SFEI's RDC database and replicating to CEDEN.
Delta RMP (FY15/16)	Pathogens Study	Quality Assurance Report on Year 2 Pathogens Data	Don Yee	07/31/17		QAO report. Funded from Data Management budget.

Delta RMP Action Items

Key to Status Colors:

Green indicates greater than 90 days until the deliverable is due.

Yellow indicates a deliverable is due within 90 days.

Red indicates a deliverable that is overdue.

	Primary	Meeting Date	Deliverable	Assigned To	Due Date	Status	Comments
1	SC Action Items from 12/18/15	12/18/15	Update table of upcoming management decisions and send back out to the SC →Delete Central Valley Diuron TMDL from table →Check status of State Water Board's proposed NNE policy for inland waters and updated as necessary →Change NNE-Delta to Delta Nutrient Research Plan	Meg Sedlak	04/25/16	Complete	
2	SC Action Items from 12/18/15	12/18/15	Respond to the SC's questions regarding how "risk potential" would be determined for prioritizing target current use pesticides for monitoring	TAC members	04/25/16		On March TAC agenda
3	SC Action Items from 12/18/15	12/18/15	Develop a Cost Allocation Schedule for SC approval that divides the \$948,000 revenue target for FY16/17 between the Participant Groups	Meg Sedlak	04/25/16	Complete	Prepared and discussed with SC co-chairs
4	SC Action Items from 12/18/15	12/18/15	Recruit an appropriate representative to fill the new stormwater seat on the SC	Stephanie Hiestand	04/25/16	Complete	Brendan Ferry has agreed to serve
5	SC Action Items from 12/18/15	12/18/15	Finalize meeting summary from December 18, 2015	Thomas Jabusch	04/25/16	Complete	
6	SC Action Items from 12/18/15	12/18/15	Arrange a call between Greg Gearheart and ASC data management staff regarding State Board data management policies, CD3, and the Estuaries Portal	Meg Sedlak	04/25/16	Complete	
7	SC Action Items from 12/18/15	12/18/15	Follow up with TMDL staff about federal requirements so that compliance data issues for Vernalis compliance point can be resolved	Adam Laputz	04/25/16		
8	SC Action Items from 12/18/15	12/18/15	Arrange a call between Adam Laputz, Greg Gearhart, and Tom Mumley to discuss coordination between the RMPs.	Meg Sedlak	04/25/16	Complete	
9	SC Action Items from 12/18/15	12/18/15	Discuss whether there is any value in testing bivalve samples collected by the Bay RMP for parameters of interest to the Delta RMP	TAC members	04/25/16	Complete	This task was deleted because it was not deemed relevant after a conference call between RB2 and RB5.
10	SC Action Items from 12/18/15	12/18/15	Schedule a call of the External Review Planning Subcommittee in January. Participants: Linda Dorn, Adam Laputz, Dave Tamayo, Val Connor, David Cory, Gregg Erickson, Sam Harader, Stephen McCord, and Joe Domagalski.	Philip Trowbridge	12/31/15	Complete	
11	SC Action Items from 12/18/15	12/18/15	Send doodle poll for an alternate date, set next meeting date, reserve room, and send invitations to the SC	Meg Sedlak	01/15/16	Complete	
12	TAC Action Items from 11/16/15	11/16/15	Draft strawman for the charge of the expert panel and distribute to the planning subcommittee	Philip Trowbridge	12/18/15	Complete	Charge drafted and distributed to planning committee.
13	TAC Action Items from 11/16/15	11/16/15	Convene planning subcommittee in the week after Thanksgiving	Philip Trowbridge	12/04/15	Complete	Meeting scheduled for 12/7/15.
14	TAC Action Items from 11/16/15	11/16/15	Present draft charge for the expert panel to the SC	Philip Trowbridge	12/18/15	Complete	Charge drafted and on SC agenda.
15	TAC Action Items from 11/16/15	11/16/15	Bring outline for the Nutrient Synthesis Workgroup to the SC and clarify that the proposed target date will be adjusted as needed to allow sufficient time for the development process	Philip Trowbridge	12/18/15	Complete	Workplan updated and on SC agenda.

	Primary	Meeting Date	Deliverable	Assigned To	Due Date	Status	Comments
16	TAC Action Items from 11/16/15	11/16/15	Plan a future discussion with the TAC to outline the process for updating the target analyte list and defining how risk should be considered	Thomas Jabusch	04/01/16	Complete	On March TAC meeting
17	TAC Action Items from 11/16/15	11/16/15	Distribute W. Fleenor's paper to the TAC	Stephen McCord	11/20/15	Complete	
18	SC Action Items from 10/23/15	10/23/15	Update SC roster	Thomas Jabusch	10/30/15	Complete	
19	SC Action Items from 10/23/15	10/23/15	Put an item on the next agenda to discuss the requests for additional Steering Committee seats for Phase I and Phase II stormwater and the State Board and the overall balance and composition of the committee	Philip Trowbridge	11/18/15	Complete	Recorded in list of potential agenda items
20	SC Action Items from 10/23/15	10/23/15	Provide a list of appropriate candidates from fisheries agencies for the vacant Resource Agencies seat	Tim Vendlinski	12/18/15	Complete	
21	SC Action Items from 10/23/15	10/23/15	Update minutes with edits requested by Val and post to Regional Board website	Thomas Jabusch	10/30/15	Complete	Updated summary sent to Regional Board staff to post
22	SC Action Items from 10/23/15	10/23/15	Update TAC summary with the correct station name for the Mokelumne on page 4 (New Hope Road)	Thomas Jabusch	10/30/15	Complete	
23	SC Action Items from 10/23/15	10/23/15	Get provisional pesticide data from USGS and post with the rest of the provisional data on the TAC website	Thomas Jabusch	10/30/15	Complete	
24	SC Action Items from 10/23/15	10/23/15	Get information on the DSP peer review process from Val Connor and share it with the Steering Committee.	Philip Trowbridge	10/30/15	Complete	
25	SC Action Items from 10/23/15	10/23/15	Talk to the Delta Science Program about getting an external review of the Monitoring Design. Coordinate with Val and Gregg on this item	Philip Trowbridge	12/18/15	Complete	
26	SC Action Items from 10/23/15	10/23/15	Convene the Finance and Revenue Subcommittees for kick-off meetings	Val Connor	12/18/15	Complete	
27	SC Action Items from 10/23/15	10/23/15	Put an item on the agenda for the fall 2016 SC meeting to review the Program expenses compared to other similar programs, the goals of the Program, and the multi-year trajectory of the Program	Philip Trowbridge	10/31/16		
28	SC Action Items from 10/23/15	10/23/15	Follow up with Val and Mike about the Finance Subcommittee to find out what assistance they need from ASC	Philip Trowbridge	10/30/15	Complete	
29	SC Action Items from 10/23/15	10/23/15	Develop a proposal for an interlaboratory comparison study for pesticides for the TAC to review	Josie Tellers	11/09/15	Complete	
30	SC Action Items from 10/23/15	10/23/15	Review and provide comments on the draft Communications Plan	Steering Committee	11/06/15	Complete	No additional comments were provided.
31	SC Action Items from 10/23/15	10/23/15	Develop ideas for a fact sheet to support fundraising efforts	Val Connor	12/18/15		Val Connor and Finance Committee
32	SC Action Items from 10/23/15	10/23/15	Review and provide comments on the draft Program Planning Overview	Steering Committee	11/06/15	Complete	No additional comments were provided.
33	SC Action Items from 10/23/15	10/23/15	Add the July 7, 2014, version of the RMP-RB Interaction Flow Chart to the RMP Foundations document with an introduction that explains that this flow chart was a foundational document and the basis for language that was added to permits. The introduction should also explain that the purpose of the flow chart is to show mutual expectations that the RMP will be used to collaboratively study issues as much as possible to avoid additional study requests from the Water Board on top of the RMP	Thomas Jabusch	12/18/15	Complete	
34	SC Action Items from 10/23/15	10/23/15	Revise adequate participation language and work with co-chairs on edits	Philip Trowbridge	12/18/15	Complete	
35	SC Action Items from 10/23/15	10/23/15	Set next meeting date for December 18, reserve room, and send invitations to the SC	Thomas Jabusch	10/30/15	Complete	

	Primary	Meeting Date	Deliverable	Assigned To	Due Date	Status	Comments
36	TAC Action Items from 9/24/15	09/24/15	Follow-up with Jamie Anderson at DWR regarding funding for mercury monitoring to calibrate the DWR mercury model	Philip Trowbridge	10/23/15	Complete	
37	TAC Action Items from 9/24/15	09/24/15	Research options for collecting samples at Buckley Cove in the middle of the channel and report back to the TAC	Joe Domagalski	11/01/15	Complete	On the agenda for the Nov 16 TAC mtg.
38	TAC Action Items from 9/24/15	09/24/15	Search for modeling information about lateral mixing at Buckley Cove	Stephen McCord	11/01/15	Complete	
39	TAC Action Items from 9/24/15	09/24/15	Organize a teleconference of the TIE subcommittee to discuss further edits to the TIE guidance, the TIE treatment list, an update on the Ceriodaphnia issue at AHPL, and the cost per treatment for TIEs so that the group can manage its budget of \$40,000 for the year	Thomas Jabusch	10/16/15	Complete	
40	TAC Action Items from 9/24/15	09/24/15	Modify the Supplemental Budget Request with a required matrix spike sample, the schedule, and locations of the sampling	Thomas Jabusch	10/09/15	Complete	
41	Steering Committee Action Items from 06/16/15	06/16/15	Post all final minutes to the Regional Board's Delta RMP website and add a note to the website saying "Draft meeting summaries are available upon request from the Regional Board"	Selina Cole	06/30/15	Complete	
42	Steering Committee Action Items from 06/16/15	06/16/15	Update the Monitoring Design with changes approved at the meeting and then post as final on the website.	Thomas Jabusch	06/30/15	Complete	
43	Steering Committee Action Items from 06/16/15	06/16/15	Put an agenda item on the next SC meeting agenda to discuss the conflict of interest policy and the guidelines for issuing RFPs.	Philip Trowbridge	10/23/15	Complete	On agenda for 10/23 SC meeting.
44	Steering Committee Action Items from 06/16/15	06/16/15	Schedule and hold a conference call between the Regional Board and MS4 Phase II communities regarding participation and fees for the Delta RMP.	Stephanie Hiestand	07/31/15		
45	Steering Committee Action Items from 06/16/15	06/16/15	Add Stephanie Hiestand to the QAPP as the representative for MS4 Phase II communities	Thomas Jabusch	06/30/15	Complete	
46	Steering Committee Action Items from 06/16/15	06/16/15	Use a doodle poll to schedule the next meeting in September or October.	Philip Trowbridge	06/30/15	Complete	
47	Steering Committee Action Items from 06/16/15	06/16/15	Schedule a discussion for the next meeting to identify the scope and panel for an external review of the Monitoring Design	Thomas Jabusch	10/23/15	Complete	Included on agenda for 9/24/15 TAC meeting.
48	Steering Committee Action Items from 06/16/15	06/16/15	Regional Board staff will set up an internal meeting with Diane Messina and Adam Laputz to discuss potential participation by Caltrans	Patrick Morris / Selina Cole	09/01/15		Regional Board staff will be contacting Caltrans to discuss potential participation
49	TAC Action Items from 5/27/15	05/27/15	Mike Johnson and Karen Ashby will provide comments on the Monitoring Design by June 1st. Debra Denton and Tessa will provide comments by June 4th.	TAC members	06/04/15	Complete	Debra Denton provided comments on June 1, 2015.
50	TAC Action Items from 5/27/15	05/27/15	ASC will revise the Design document and send it back out the TAC with 5 business days for review.	Thomas Jabusch	06/08/15	Complete	
51	TAC Action Items from 5/27/15	05/27/15	Stephen McCord will convene a conference call or online polling method before June 16th so that he can report to the SC whether the TAC recommends approval or provisional approval of the revised Monitoring Design.	Stephen McCord	06/15/15	Complete	
52	TAC Action Items from 5/27/15	05/27/15	Adam agreed to follow up with Rich Breuer to learn if the requirement for State Board approval of the QAPP only applied to SWAMP-funded part of the work or the full QAPP.	Adam Laputz	06/03/15	Complete	
53	TAC Action Items from 5/27/15	05/27/15	ASC should make sure the QAPP data management provisions are SWAMP compatible. Phil agreed to check with Cristina Grosso about this.	Philip Trowbridge	06/03/15	Complete	SFEI data management procedures are SWAMP compatible.

	Primary	Meeting Date	Deliverable	Assigned To	Due Date	Status	Comments
54	TAC Action Items from 5/27/15	05/27/15	After receiving comments from the laboratories by June 1st, ASC will revise the QAPP and send it back out to the TAC with 5 business days to review.	Thomas Jabusch	06/08/15	Complete	
55	TAC Action Items from 5/27/15	05/27/15	Stephen McCord will schedule a conference call or online polling tool before June 16th in order to determine whether the TAC recommends approval of the QAPP or provisional approval. Stephen McCord will provide a verbal report to the SC on June 16th.	Stephen McCord	06/15/15	Complete	
56	TAC Action Items from 5/27/15	05/27/15	Discuss with the SC co-chairs about having a joint meeting of the SC and TAC to decide about the funding allocations for FY15/16	Philip Trowbridge	06/03/15	Complete	Recommendation added the FY15/16 workplan report to the SC.
57	TAC Action Items from 5/27/15	05/27/15	Revise the budget for the SC to show the available funding relative to the "bare bones" Monitoring Design funding levels so the SC can make the trade-off decisions.	Philip Trowbridge	06/05/15	Complete	
58	TAC Action Items from 5/27/15	05/27/15	Stephen McCord will send an email to the TAC with the proposal to officially approve the TIE subcommittee members as discussed in the May 27 meeting	Stephen McCord	06/03/15	Complete	
59	TAC Action Items from 5/27/15	05/27/15	ASC will receive comments on the TIE process memo. When all the comments have been received, ASC will send them to the TIE subcommittee to review and incorporate into the memo, which will be shared with the whole TAC.	Thomas Jabusch	06/10/15	Complete	
60	TAC Action Items from 5/27/15	05/27/15	Mike Johnson agreed to send Stephen McCord his notes with questions about the Hyalella test.	Mike Johnson	06/03/15	Complete	
61	TAC Action Items from 5/27/15	05/27/15	Stephen Clark agreed to send Stephen McCord information about possible special studies that could be done to resolve questions about the Hyalella test.	Stephen Clark	06/03/15	Complete	
62	TAC Action Items from 5/27/15	05/27/15	Brian Laurenson agreed to send Stephen McCord his comments on the last set of slides for the SC which had information on possible special studies.	Brian Laurenson	06/03/15	Complete	
63	TAC Action Items from 5/27/15	05/27/15	Stephen McCord agreed to write a memo to the SC with options regarding the Hyalella test.	Stephen McCord	06/09/15	Complete	
64	TAC Action Items from 5/27/15	05/27/15	Provide an update on any nexus between Delta RMP and Central Valley Pyrethroids TMDL	Tessa Fojut	03/31/16		
65	TAC Action Items from 4/22	04/22/15	Thomas and Stephen will develop a develop a full chronology of TAC decisions, in a format similar to Delta RMP Record of Decisions (SC).	Thomas Jabusch	05/22/15	Complete	
66	TAC Action Items from 4/22	04/22/15	Thomas will distribute SCCWRP study objectives and protocol to the TAC, when available	Thomas Jabusch	05/22/15	Complete	On agenda for 5/27/15
67	TAC Action Items from 4/22	04/22/15	Thomas and Stephen will compare and contrast study objectives to Delta RMP's interests and concerns regarding Hyalella, especially regarding the issue of environmental relevance	Thomas Jabusch	05/22/15	Complete	To be completed with Stephen McCord
68	TAC Action Items from 4/22	04/22/15	Thomas: Consider adding phenotype testing and supplying Delta environmental samples for 2nd round of testing	Thomas Jabusch	05/22/15	Complete	Re phenotype testing: Can create a running wish list of special studies such as the phenotype testing.
69	TAC Action Items from 4/22	04/22/15	Coordinate the TIE subcommittee	Thomas Jabusch	05/22/15	Complete	
70	TAC Action Items from 4/22	04/22/15	Linda (AHPL) will generate a treatment template to clearly describe TIE treatments to be performed	Linda Deanovic	05/22/15	Complete	
71	TAC Action Items from 4/22	04/22/15	Stephen will articulate a question to SC asking whether TIE's should track down non-pesticide causes of toxicity, if funds allow	Stephen McCord	06/16/15	Complete	To be discussed at SC meeting on 6/16/15.

	Primary	Meeting Date	Deliverable	Assigned To	Due Date	Status	Comments
72	TAC Action Items from 4/22	04/22/15	Cam will draft a document to accompany the TIE decision flow chart	Cam Irvine	05/22/15	Complete	Include communications protocols and additional insight on decision process. To be completed with Thomas Jabusch
73	TAC Action Items from 4/22	04/22/15	Joe and Jim will clean up the USGS pesticide sampling triggers	Joe Domagalski	05/22/15	Complete	Edits were provided by Stephen McCord and discussed at the TAC meeting
74	TAC Action Items from 4/22	04/22/15	Jim will add "alert" levels for the USGS to use to alert AHPL of possible events	Jim Orlando	05/22/15	Complete	In QAPP.
75	TAC Action Items from 4/22	04/22/15	Jim and Joe will add a field to the field log to document sampling conditions	Jim Orlando	05/22/15	Complete	Part of USGS standard practice. The sampling conditions log will be used to improve event triggers based on experience.
76	TAC Action Items from 4/22	04/22/15	Thomas will provide a clean draft final monitoring design to the TAC for review	Thomas Jabusch	05/22/15	Complete	On agenda for 5/27/15
77	TAC Action Items from 4/22	04/22/15	Review the draft QAPP	TAC members	05/01/15	Complete	Notify Thomas Jabusch of any delays
78	TAC Action Items from 4/22	04/22/15	Identify points in data flow chart when TAC members can access data, and clarify frequency of QA review for monthly sampling events	Cristina Grosso	05/22/15	Complete	In QAPP.
79	TAC Action Items from 4/22	04/22/15	Set up a password-protected space for provisional data on the CA Estuaries Workgroup portal	Stephanie Fong	05/22/15	Complete	SFEI-ASC will make provisional data files available by posting them to the TAC website, from where they can be viewed and downloaded by TAC members and transferred to the worker bee space of the Estuaries portal.
80	Steering Committee Action Items from 03/27/15	03/27/15	ASC will revise the minutes from the 1/22/15 SC meeting. The paragraph on Hyalella on page 7 and the second action item underneath it should show that there were concerns about the lab methodologies and interlaboratory comparability for the Hyalella test procedure in water.	Thomas Jabusch	04/30/15	Complete	
81	Steering Committee Action Items from 03/27/15	03/27/15	Adam Laputz will share the decision-making flow chart with ASC.	Adam Laputz	04/30/15	Complete	Linda Dorn has shared the flow chart with Thomas Jabusch.
82	Steering Committee Action Items from 03/27/15	03/27/15	Patrick Morris will find out if the SWAMP contract with ATL can fund participation in the SCCWRP interlaboratory comparability study.	Patrick Morris	04/30/15	Complete	SWAMP contract manager confirmed that funds can be used to analyze samples for the study.
83	Steering Committee Action Items from 03/27/15	03/27/15	ASC and the TAC Co-Chairs will prepare a 1-hour agenda item for the next SC meeting on the interpretation and application of monitoring results, with a focus on pesticides monitoring. The TAC recommendations, the draft decision-making flow chart, and the TIE decision matrix will be included in the presentation.	Thomas Jabusch	05/31/15	Complete	On the agenda for the 6/16/15 meeting
84	Steering Committee Action Items from 03/27/15	03/27/15	Schedule agenda item to discuss and resolve any changes that were made by the TAC to the Management Questions on page 6 (Pesticide Table 1) of the revised Monitoring Design.	Thomas Jabusch	05/31/15	Complete	On the agenda for the 6/16/15 meeting
85	Steering Committee Action Items from 03/27/15	03/27/15	ASC will make sure the TAC website is up to date and ensure that the April 22 TAC meeting is publicly noticed.	Thomas Jabusch	04/08/15	Complete	
86	Steering Committee Action Items from 03/27/15	03/27/15	ASC will contact Val Connor at SFCWA to get documentation about previous work by SFCWA, USGS, and RB5 to develop target analyte lists for pesticides.	Thomas Jabusch	04/30/15	Complete	

	Primary	Meeting Date	Deliverable	Assigned To	Due Date	Status	Comments
87	Steering Committee Action Items from 03/27/15	03/27/15	ASC will work with the TAC, ILRP, and RB5 to come up with the recommended list of target pesticides for the FY15/16 workplan. The list will reside in the Monitoring Design.	Thomas Jabusch	05/15/15	Complete	ASC has compiled a master list that compares the target pesticides for ILRP and the different labs. RB5 and ILRP met to discuss the list.
88	Steering Committee Action Items from 03/27/15	03/27/15	ASC will develop a process for reviewing and updating the list of target pesticide analytes as part of the Communications Plan in FY15/16.	Thomas Jabusch	09/30/15	Complete	The process was included in the draft Communications Plan and Project Planning Cycle.
89	Steering Committee Action Items from 03/27/15	03/27/15	Joe Domagalski will send ASC the final report from a recent USGS study of pesticides.	Joe Domagalski	04/30/15	Complete	
90	Steering Committee Action Items from 03/27/15	03/27/15	ASC will revise the FY14/15 workplan as directed by the SC: (1) update Section 5 to be refer to the SCCWRP interlaboratory comparability study; (2) update the Vendor Selection Form for the USGS Pesticide Lab; and (3) update the Vendor Selection Form the USGS nutrient synthesis.	Philip Trowbridge	04/03/15	Complete	
91	Steering Committee Action Items from 03/27/15	03/27/15	ASC will revise the Financial Management Plan as directed by the SC: (1) attach the process for RFPs; (2) require SC approval for sole source contracts; and (3) refer to the Implementing Entity generically.	Philip Trowbridge	04/03/15	Complete	Items 2 and 3 are complete. The RFP process has been revised but needs SC review at the next meeting before being attached as guidance to the Financial Management Plan.
92	Steering Committee Action Items from 03/27/15	03/27/15	Linda Dorn and Patrick Morris will revise the Adequate Participation language and will bring it back to the SC at the next meeting.	Linda Dorn	05/31/15	Complete	
93	Steering Committee Action Items from 03/27/15	03/27/15	ASC will include an option for external science advisers or a program review in the FY15/16 workplan. ASC will research whether the Delta Science Program's science panel can serve this role.	Philip Trowbridge	05/31/15	Complete	There may be a way for the DSC to facilitate the review but (a) the SC will still need to budget some funds for it and (b) the review would most likely consider the Delta RMP within the broader context of all Delta monitoring programs.
94	Steering Committee Action Items from 03/27/15	03/27/15	Tim Vendlinski will attend the April 22, 2015 TAC meeting.	Tim Vendlinski	04/22/15	Complete	
95	Steering Committee Action Items from 03/27/15	03/27/15	Selina Cole will update the Delta RMP website and publicly notice the TAC meeting via the Delta Water Quality lyrics list	Selina Cole	04/10/15	Complete	
96	Steering Committee Action Items from 03/27/15	03/27/15	ASC will work with Stephen McCord and Joe Domagalski on options for TAC Co-Chairs in FY15/16. The three options are (1) to continue with Stephen and Joe as Co-Chairs providing coordination and leadership; (2) to have ASC provide coordination and Stephen and Joe provide leadership; and (3) to have ASC provide coordination with an unpaid Chair. The value of the in-kind service by the unpaid Chair should be part of the calculation.	Philip Trowbridge	05/31/15	Complete	
97	Steering Committee Action Items from 03/27/15	03/27/15	ASC will send out a list of Decisions and Action Items from the 3/27/15 meeting by 4/3/15.	Thomas Jabusch	04/03/15	Complete	
98	Steering Committee Action Items from 03/27/15	03/27/15	ASC will send a doodle poll for the next SC meeting. The meeting must be before 6/16/15 and may need to be even sooner depending the time needed for any RFPs that may be needed.	Thomas Jabusch	04/03/15	Complete	
99	Steering Committee Action Items from 01/22/15	01/22/15	ASC will provide draft SOTER indicator write-ups when they are ready to the TAC and SC for review and comment.	Jay Davis	03/27/15	Complete	
100	Steering Committee Action Items from 01/22/15	01/22/15	ASC will provide a pdf version of the Delta RMP poster to the SC	Thomas Jabusch	01/29/15	Complete	

	Primary	Meeting Date	Deliverable	Assigned To	Due Date	Status	Comments
101	Steering Committee Action Items from 01/22/15	01/22/15	ASC will revise the minutes of the last two SC meetings to correct inaccuracies.	Thomas Jabusch	03/27/15	Complete	
102	Steering Committee Action Items from 01/22/15	01/22/15	ASC will report back to the SC about whether the proposed contractors for the FY14/15 workplan would be in compliance with the State Contracting Manual and if there is any appearance of conflict of interest. In particular, ASC will check the legality of contracting USGS for the pesticide analyses, high-frequency data analysis, and potentially field sampling, with Joe Domagalski (USGS) as one of the co-chairs.	Philip Trowbridge	03/27/15	Complete	
103	Steering Committee Action Items from 01/22/15	01/22/15	ASC will sign up members of the TIE subcommittee	Thomas Jabusch	03/27/15	Complete	
104	Steering Committee Action Items from 01/22/15	01/22/15	The TAC will provide the SC with information about evaluating and interpreting Hyalella data, recommendations regarding the Hyalella strain to be used, and identify the scientific issues involved with interpreting and/or qualifying test results.	Stephen McCord	03/27/15	Complete	
105	Steering Committee Action Items from 01/22/15	01/22/15	ASC will revise the Monitoring Design document based on comments received from the SC.	Thomas Jabusch	05/31/15	Complete	
106	Steering Committee Action Items from 01/22/15	01/22/15	ASC will send the Monitoring Design document (11/3/14 draft) and the list of identified changes to the SC mailing list and ask participants to submit additional revisions by 1/30/15.	Thomas Jabusch	01/29/15	Complete	
107	Steering Committee Action Items from 01/22/15	01/22/15	ASC and Brock Bernstein will convene conference calls, if there are conflicting comments that get to the core of the design and are high priority to resolve.	Thomas Jabusch	03/27/15	Complete	
108	Steering Committee Action Items from 01/22/15	01/22/15	ASC will develop a new document that defines the Delta RMP's process for data analysis and interpretation, reporting, and application of results to address the management questions. This document should also contain an annual schedule for coordinating with deadlines of different organizations.	Thomas Jabusch	12/31/15	Complete	Communications Plan. Program Planning Overview.
109	Steering Committee Action Items from 01/22/15	01/22/15	ASC will add sole source justifications to the FY14/15 Annual Workplan	Philip Trowbridge	03/27/15	Complete	
110	Steering Committee Action Items from 01/22/15	01/22/15	ASC will follow up with Gregg Erickson to find out if there is an existing contract between ASC, DWR, and USGS.	Philip Trowbridge	03/27/15	Complete	
111	Steering Committee Action Items from 01/22/15	01/22/15	Since there will not be an RFP, ASC will subtract \$4,500 from the pesticide/toxicity budget.	Philip Trowbridge	03/27/15	Complete	
112	Steering Committee Action Items from 01/22/15	01/22/15	Patrick Morris will investigate whether FY15/16 onwards SWAMP funds can be used for other purposes, such as pesticides analyses.	Patrick Morris	03/27/15	Complete	Currently the only SWAMP contract that could be used for the Delta RMP is for toxicity analyses.
113	Steering Committee Action Items from 01/22/15	01/22/15	ASC will prepare a process for FY15/16 and onwards to ensure that selection of contractors complies with the public contracting code and avoids any actual or apparent conflict of interest.	Philip Trowbridge	03/27/15	Complete	
114	Steering Committee Action Items from 01/22/15	01/22/15	ASC shall implement appropriate funding mechanisms (e.g., invoice, contract) as needed to meet the needs of different Delta RMP members.	Philip Trowbridge	03/27/15	Complete	
115	Steering Committee Action Items from 01/22/15	01/22/15	ASC will assist the SC in developing a longer-term funding mechanism (e.g., MOU) that will lower administrative costs and provide a more formal basis for participation	Philip Trowbridge	03/31/16	Complete	The MOA was added as a deliverable for the FY15/16 workplan.
116	Steering Committee Action Items from 01/22/15	01/22/15	Val Connor will review the Financial Management Plan with SFCWA's attorney.	Val Connor	03/27/15	Complete	Action item deleted.
117	Steering Committee Action Items						