



## AGENDA

### Delta RMP Steering Committee Meeting Friday, February 22, 2019 10:00 am – 4:00 pm

#### Location

Regional San, Sunset Maple Room,  
10060 Goethe Road, Sacramento, CA

#### Remote Access

Call-in: 415-594-5500, Access Code: 238-626-034#  
Online: <https://join.me/sfei-conf-cw2>

| # | Agenda item and desired outcomes   | Attachments   | Start & Lead                    |
|---|--|---|---------------------------------|
| 1 | <b>Introductions and Review Agenda</b><br>Introduce TAC and SC members, establish quorum, and explain goals of the meeting.  |   | 10:00<br>Adam Laputz            |
| 2 | <b>Decision:</b> Approve meeting summary from Oct 29, 2018 joint meeting and and confirm/set upcoming meeting dates.<br><br><b>Desired outcomes:</b> <ul style="list-style-type: none"> <li>Approve meeting summaries</li> <li>Set meeting dates for May 2019 and July/Aug 2019</li> </ul> <b>(Please bring your calendar to the meeting!)</b> | Draft Summary of Oct 29, 2018 Joint SC-TAC Meeting<br><br>Draft Summary of Dec 19, 2018 SC Teleconference | 10:05<br>Adam Laputz            |
| 3 | <b>Information: Technical Advisory Committee update</b><br>Update on TAC meeting held on January 17, 2019. Recap of Social Sciences Task Force kick-off meeting.<br><br><b>Desired outcome:</b> <ul style="list-style-type: none"> <li>Inform committee on monitoring activities and proposals for the upcoming fiscal year.</li> </ul>        | Draft Summary of Jan 17, 2019 TAC Meeting   | 10:15 – 10:30<br>Stephen McCord |

| #            | Agenda item and desired outcomes   | Attachments  | Start & Lead                                 |
|--------------|--|--|--|
| 4            | <p><b>Information: Delta RMP finances</b><br/>The Finance Update memo summarizes Delta RMP revenues, expenses, and the status of the reserve fund.</p> <p><b>Desired outcomes:</b></p> <ul style="list-style-type: none"> <li>Informed committee</li> </ul>  | Quarterly Finance Update Memo  | 10:30 – 11:00<br>Matt Heberger<br>Dalia Fadl |
| 5            | <p><b>Decision: Approve public release of FY16/17 Pesticides Data via CEDEN</b><br/>Pesticides chemistry data from Year 2 of Delta RMP monitoring has been made available online via the USGS' National Water Information Service (NWIS). In keeping with the Delta RMP Communications Plan, ASC will make program data publicly available after review by the TAC and approval by the SC. Note that in July 2017, the SC voted not to produce a Year 2 data report, but instead to support the creation of a web-based "data visualization" tool.</p> <p><b>Desired outcomes:</b></p> <ul style="list-style-type: none"> <li>SC decision to approve and publish the dataset.</li> </ul> | <p>*Spreadsheet of FY16/17 Pesticides Chemistry Data*</p> <p>*Memo from ASC QA Officer</p> <p>*Pesticides Dataviz<sup>1</sup></p>  | 11:00 – 11:30<br>Stephen McCord              |
| 6            | <p><b>Project Progress Update</b><br/>Report by ASC on the implementation of the workplan to date, including update monitoring Contaminants of Emerging Concern (CECs), progress on the Pesticides Interpretive Report by the contractor Deltares.</p> <p><b>Desired outcomes:</b></p> <ul style="list-style-type: none"> <li>Informed committee</li> <li>SC input on timing of milestones and key opportunities for input.</li> </ul>   | <p>Project Schedule (Gantt Chart) including milestones, deliverables (<a href="#">link</a>)</p> <p>Delta RMP Stoplight Reports</p> | 11:30 – 12:00<br>Matt Heberger               |
| <b>Lunch</b> |  |  | 12:00 – 1:00                                 |

<sup>1</sup> Matt H. sent a link to download the dataviz app via email to the SC, TAC, and Pesticides Subcommittee on July 14, 2018, and has given demos for the Pesticides Subcommittee and TAC. This dataviz has not been made publicly available or posted online—in order to view it you must download the files onto your computer and open it in a browser.

The purpose is to visualize the first 2 years of Delta RMP Pesticides data, and it is meant to be simple and easy to use. It shows results for the 152 synthetic organic pesticides analyzed by the USGS Organic Chemistry Research Laboratory (OCRL). The app lets you compare observations to EPA's Aquatic Life Benchmarks, or a custom threshold of your choice. Note that it does not show results for ancillary parameters, copper, or aquatic toxicity, nor does not show QA flags. These were considered beyond the scope of this simple tool which was created *pro bono*, at no expense to the program.

| #  | Agenda item and desired outcomes  | Attachments  | Start & Lead                             |
|----|---|--|--|
| 7  | <p><b>Multi-Year Planning Process</b><br/>Introduction and overview of the process. Prelude to a multi-year planning workshop in the fall of 2019. As a first step, TAC members have created a table of “management drivers” of important future water management that Delta RMP monitoring could help inform.</p> <p><b>Desired outcomes:</b></p> <ul style="list-style-type: none"> <li>• SC familiarity with and feedback on the Multi-Year planning process.</li> <li>• Review table of management drivers.</li> </ul>  | <p>Management Drivers Table<br/><a href="#">(link)</a></p>           | <p>1:00 – 2:00<br/>Matt Heberger</p>     |
| 8  | <p><b>Report by the ad hoc subcommittee on governance</b><br/>A group of volunteers met twice to discuss representation and the process for adding new participants and voting members to the SC.</p> <p><b>Desired Outcome:</b><br/>Inform committee on findings and recommendations</p>   | <p>Meeting Summaries, Memo on SC seats</p>                           | <p>2:00 – 2:30<br/>Matt Heberger</p>     |
| 9  | <p><b>Science Presentation:</b><br/>Scientists from the USGS Biogeochemical Research Group have completed 3 sets of 3-day cruises to create high-resolution measurements of nutrients and related water quality parameters. The objectives were to identify “hot spots” of nutrient transformation, and to locate internal sources and sinks for nutrients within the Delta. A member of the research team will share provisional results and discuss next steps.</p> <p><b>Desired Outcome:</b></p> <ul style="list-style-type: none"> <li>• Informed Committee</li> </ul> | <p>Project Description (extract from Delta RMP FY17-18 Workplan)</p> | <p>2:30 – 3:30<br/>Brian Bergamaschi</p> |
| 10 | <p><b>Wrap Up</b></p> <ul style="list-style-type: none"> <li>• Review Action Items</li> <li>• Suggest agenda items for next meeting</li> </ul>  |  | <p>3:30<br/>Adam Laputz</p>              |
|    | <b>Adjourn</b>  |  | <b>4:00</b>                              |

# Recent Publications

funded wholly or in part by the Delta RMP

## Pulse of the Delta

Aquatic Science Center. "The Pulse of the Delta: Monitoring and Managing Water Quality in the Sacramento - San Joaquin Delta." Oakland, California, 2011.

Aquatic Science Center. "The Pulse of the Delta: Linking Science & Management through Regional Monitoring." Richmond, California, 2012. <https://www.sfei.org/documents/pulse-delta-linking-science-management-through-regional-monitoring>.

## Nutrients reports by USGS

1. An introduction to high-frequency nutrient and biogeochemical monitoring for the Sacramento–San Joaquin Delta, northern California. 2017. <http://pubs.er.usgs.gov/publication/sir20175071>
2. Synthesis of data from high-frequency nutrient and associated biogeochemical monitoring for the Sacramento–San Joaquin Delta, northern California. 2017. <http://pubs.er.usgs.gov/publication/sir20175066>
3. Designing a high-frequency nutrient and biogeochemical monitoring network for the Sacramento–San Joaquin Delta, northern California. 2017. <http://pubs.er.usgs.gov/publication/sir20175058>

## Nutrients reports by ASC

1. Characterizing and quantifying nutrient sources, sinks and transformations in the Delta: synthesis, modeling, and recommendations for monitoring. 2015. <http://sfbaynutrients.sfei.org/books/dwr-contract-deliverable>
2. Nutrient Monitoring Planning Workshop - Summary of Existing Nutrient Monitoring Programs, Data Gaps, and Potential Delta RMP "No Regrets" Monitoring Activities. 2016. [http://www.waterboards.ca.gov/rwqcb5/water\\_issues/delta\\_water\\_quality/delta\\_regional\\_monitoring/studies\\_reports/dmp\\_workshop\\_rpt\\_20161017.pdf](http://www.waterboards.ca.gov/rwqcb5/water_issues/delta_water_quality/delta_regional_monitoring/studies_reports/dmp_workshop_rpt_20161017.pdf)
3. Assessment of Nutrient Status and Trends in the Delta in 2001–2016: Effects of drought on ambient concentrations and trends. 2018. <https://www.sfei.org/documents/delta-nutrient-status-2018>
4. Delta RMP Nutrients Synthesis: Modeling to Assist Identification of Temporal and Spatial Data Gaps for Nutrient Monitoring. 2018. <https://www.sfei.org/documents/delta-nutrients-modeling>

5. Beck, M. W., T. W. Jabusch, P. R. Trowbridge, and D. B. Senn. "Four Decades of Water Quality Change in the Upper San Francisco Estuary." *Estuarine, Coastal and Shelf Science* 212 (November 2018): 11–22. <https://doi.org/10.1016/j.ecss.2018.06.021>.

## Pathogens

1. Pathogen Study Final Report, by Larry Walker Associates. 2018. [https://www.waterboards.ca.gov/centralvalley/water\\_issues/delta\\_water\\_quality/delta\\_regional\\_monitoring/reports/pathogens/drmp\\_path\\_study\\_1517.pdf](https://www.waterboards.ca.gov/centralvalley/water_issues/delta_water_quality/delta_regional_monitoring/reports/pathogens/drmp_path_study_1517.pdf)

## Pesticides

1. Delta Regional Monitoring Program Annual Monitoring Report for Fiscal Year 2015–16: Pesticides and Toxicity. <http://www.sfei.org/documents/delta-pesticides-2016>
2. De Parsia, M., J.L. Orlando, M.M. McWayne, and M.L. Hladik. "Pesticide Inputs to the Sacramento-San Joaquin Delta, 2015-2016: Results from the Delta Regional Monitoring Program." Sacramento, California: U. S. Geological Survey, California Water Science Center, 2018. <https://pubs.er.usgs.gov/publication/ds1089>.

## Mercury

1. Mercury and Methylmercury in Fish and Water from the Sacramento-San Joaquin Delta: August 2016 – April 2017. <https://www.sfei.org/documents/delta-mercury-2016>

## Forthcoming Publications

- Spring 2019: Year 2 Pesticides Data Report, Matt DeParsia and Jim Orlando, USGS
- Spring 2019: Cross-Delta monitoring using high-frequency monitoring tools, USGS Biogeochemical Research Group.
- Spring 2019: Year 2 Mercury Monitoring Report, Jay Davis, ASC, and Wes Heim, Moss Landing Marine Laboratory
- June 2019: Pesticides and Toxicity Interpretive Report, Erwin Roex, Deltares
- June 2019: Chlorophyll sensor intercalibration study report
- Fall 2020: Pulse of the Delta, Vol. 3

# Materials for Agenda Item 4



DATE: February 8, 2019 (updated February 14, 2019)  
TO: Delta RMP Steering Committee  
THROUGH: Delta RMP Finance Committee  
FROM: Matthew Heberger, Program Manager, Aquatic Science Center  
RE: Summary of Delta RMP Financials for the period ending Dec 31, 2018

This memorandum provides an update of budgets and expenses for the Delta RMP and the balance of the Undesignated Reserve Fund. The figures in this memo are current through December 31, 2018, or the second quarter of fiscal year 2018-19 (FY18-19).

## Financial Snapshot

### Financial Assets

|                     |                    |
|---------------------|--------------------|
| Cash                | \$1,403,467        |
| Accounts Receivable | \$0                |
|                     | <hr/>              |
|                     | <b>\$1,403,467</b> |

### Liabilities

|                              |                    |
|------------------------------|--------------------|
| Subcontracts                 | \$758,506          |
| ASC Planned Labor & Expenses | \$449,931          |
|                              | <hr/>              |
|                              | <b>\$1,208,437</b> |

### Other

|                  |           |
|------------------|-----------|
| Reserve Fund     | \$171,322 |
| Expected Revenue | \$140,000 |

### Definitions:

**Financial Assets** – Includes cash and cash equivalents and accounts receivable. We refer here only to “financial” assets as the Delta RMP does not own any physical assets such as equipment or supplies.

**Reserve Fund** – A dedicated “set aside” fund maintained in ASC’s accounting system. If there are excess funds in the Program account at the end of a budget year, the funds can

be put into the Reserve Fund to be applied toward subsequent years of Program implementation with approval of the Steering Committee.

**Cash** – Money in the ASC checking account and savings account that belongs to the Delta RMP.

**Accounts Receivable** - “The balance of money due to a firm for goods or services delivered or used but not yet paid for by customers” (Investopedia). In our case, this represents invoices that we have sent to Delta RMP contributors but which have not yet been paid.

**Liabilities** – “A company’s legal financial debts or obligations that arise during the course of business operations” (Investopedia). These can be thought of as “encumbered funds” that are restricted for a given purpose, such as subcontracts or honoraria, or planned labor or direct expenses.

**Expected revenue** is revenue that we *expect* to receive, but we have *not yet invoiced*, therefore it is be counted under accounts receivable. At present, this consists of:

- (1) We expect to receive \$60,000 from the State Water Contractors, but cannot invoice them until we produce a certain deliverable, the draft pesticides interpretive report. This work is underway by our subcontractor Deltares.
- (2) We will invoice CalTrans for \$80,000 as soon as we have a signed contract with the agency. The draft contract is currently being reviewed by CalTrans’ contracting department, which we were told has a 6-month backlog. We hope to resolve this in February or March 2019.

## Revenue in FY18-19

In the FY18-19 workplan, we reported an expected revenue for the fiscal year of **\$900,256**. Since that time, we received word of three new participants joining the program. Two of these agencies are or will be contributing directly to the Delta RMP:

- \$200,000 California Department of Water Resources
- \$80,000 California Department of Transportation (CalTrans)

The other new participant, the US Army Corps of Engineers, is contributing \$50,000 to the Delta RMP by directly paying the USGS for field work and lab analysis. This contribution is being tracked as an “in kind” contribution because this cash is not paid to ASC. A more detailed description of this arrangement was provided in the June 29, 2018 finance memo.

Based on the 2 new direct contributors to the program, we revised the revenue forecast for FY18-19 upward by \$280,000 to **\$1,180,256**.

To date, we have collected 93% of expected revenue. ASC sent invoices to Delta RMP participants in May 2018, with payments expected by July 30, 2018. To date, we have issued 50 invoices, and all 50 have been paid, for a total of \$1,100,256. As noted above, we have not yet invoiced CalTrans for their expected \$80,000 contribution, as we are waiting for Caltrans to sign a contract with ASC.

### **Changes to FY18-19 Workplan Expenses**

Since the workplan was approved in May 2018, we have made several changes to the budget based on updated plans and priorities. These changes are shown in Table 1 on the next page. The net result of these changes is a \$4,532 decrease in planned expenses:

|                       |                    |
|-----------------------|--------------------|
| Original Budget       | \$1,098,244        |
| Amendments            | -\$4,532           |
| <b>Revised Budget</b> | <b>\$1,093,712</b> |

**Table 1. Changes to the planned expenses from the original FY18-19 workplan**

| Task  | Subtask  | Expense Type          | Original Budget | Budget Amendment | Revised Budget | Rationale  |
|---|--|-----------------------|-----------------|------------------|----------------|--|
| 01. Core Functions  | A. Program Planning                                | Labor                 | \$68,250        | -\$3,120         | \$65,130       | Transferred \$3,120 from ASC labor to subcontracts. Contract with AMS for Dr. Aroon Melwani to perform power analysis and statistical analysis for the pesticides monitoring design.   |
|   |  | Subcontracts          | \$0             | +\$3,120         | \$3,120        | Transferred from labor to subcontracts, per note in row above.   |
|   | C. Proposal Writing                                | Labor                 | \$0             | +\$8,306         | \$8,306        | <b>New subtask</b> added in Oct 2018, with authorization of the Finance Committee. Provides for ASC staff time to write and submit a Prop 1 grant proposal for CEC monitoring.   |
| 04. Nutrients Special Studies FY18-19                         | A. Nutrients Modeling Study                        | Subcontracts          | \$85,000        | -\$35,000        | \$50,000       | Cancelled the planned subcontract with Deltares when they changed their mind about writing hydrodynamic model converter code. Transferred to ASC labor. This work is being done by Dr. Allie King, new hire in the nutrients group.  |
|   |  | Labor                 | \$101,000       | +\$35,000        | \$136,000      | Transferred from subcontracts to ASC labor. See note above.  |
| 05. Mercury Monitoring FY18-19                                | A Data Collection and Analysis                     | Subcontracts          | \$242,130       | +\$46,581        | \$288,711      | Budget amended by Steering Committee on Oct 29, 2018. We decided to increase the number of mercury water sampling events from 8 to 10 per year.  |
| 06. Pesticides Monitoring FY18-19                             | A. Field sample collection and laboratory analysis | Subcontracts          | \$199,873       | -\$44,356        | \$155,517      | Budget decreased by \$44,356, as the US Army Corps of Engineers made a direct cash contribution to the subcontractor USGS that will cover a portion of the planned work. This in-kind contribution to the program is in lieu of making a cash contribution to ASC to pay for their Delta RMP dues. |
|   |  | B. Toxicity reporting | Subcontracts    | \$15,063         | -\$15,063      | \$0  |
| <b>Net change to planned expenses in the FY18-19 workplan</b> |  |                       |                 | <b>-\$4,532</b>  |                |  |

## Expenses

Job-to-date (JTD) expenses through the second quarter of the fiscal year are tracking roughly in line with expectations. A summary of expenses by task is shown in Table 2. Additional details are shown in Table 5 at the end of this memo.

We expect burn rates on several tasks to be higher in the next quarter as we begin receiving monitoring data from labs and cooperators.

**Table 2. Planned and actual expenses by task, through Dec 31, 2018.**

| Task   | Planned expense    | Actual JTD Expense | Percent spent |
|--|--------------------|--------------------|---------------|
| <b>Tasks Authorized in the FY17-18 Workplan*</b> |                    |                    |               |
| 02.D Science Advisors Honoraria                  | \$10,000           | \$9                | 0%            |
| 04.B Pulse of the Delta draft                    | \$40,000           | \$1,178            | 3%            |
| 08. Pesticides Interpretive Report               | \$88,000           | \$10,774           | 12%           |
| 09. A. High Frequency Nutrients Monitoring       | \$195,000          | \$195,000          | 100%          |
| 10. Mercury Monitoring FY17-18                   | \$233,561          | \$146,546          | 63%           |
| 176.B. Pesticides laboratory analysis            | \$154,029          | \$111,663          | 72%           |
| <b>Total</b>                                     | <b>\$720,590</b>   | <b>\$465,170</b>   | <b>65%</b>    |
| <b>Tasks Authorized in the FY18-19 Workplan</b>  |                    |                    |               |
| 01. Core Functions*                              | \$124,400          | \$63,587           | 48%           |
| 02. Governance                                   | \$134,800          | \$38,937           | 29%           |
| 03. Quality Assurance                            | \$32,500           | \$20,271           | 62%           |
| 04. Nutrients Special Studies FY18-19            | \$228,400          | \$19,157           | 8%            |
| 05. Mercury Monitoring FY18-19                   | \$323,791          | \$2,692            | 1%            |
| 06. Pesticides Monitoring FY18-19                | \$196,515          |                    | 0%            |
| 07. CEC Monitoring Plan FY18-19                  | \$45,000           | \$2,596            | 6%            |
| <b>Total</b>                                     | <b>\$1,093,712</b> | <b>\$147,239</b>   | <b>13%</b>    |

\*Only showing FY17-18 open tasks and subtasks. Completed tasks have been closed and the surplus was transferred to the Undesignated Reserve Fund on Oct 29, 2018.

Table 3 shows expense by category (ASC labor, subcontracts, and direct expenses). The subcontractor expenses are low in particular, as we do not log the expense until invoices are received and paid out.

**Table 3. Budget and job-to-date expense for FY18-19 by category of expense.**

|                | Budget                | Expense JTD      | Percent spent |
|----------------|-----------------------|------------------|---------------|
| Labor          | \$532,314.00          | \$137,228        | 26%           |
| Subcontracts   | \$557,398.00          | \$9,720          | 2%            |
| Direct Expense | \$4,000.00            | \$291            | 7%            |
| <b>Total</b>   | <b>\$1,093,712.00</b> | <b>\$147,239</b> | <b>13%</b>    |

### **Undesignated Reserve Fund**

The current balance of undesignated funds is \$171,322. Table 4 shows a running list of deposits and withdrawals into the Undesignated Reserve Fund.

**Table 4 Delta RMP Undesignated Reserve Fund ledger.**

| Budget Year | Deposit or Withdrawal | Authorized By      | Date         | Amount           | Comment  |
|-------------|-----------------------|--------------------|--------------|------------------|--|
| FY14-15     | Deposit               | Steering Committee | 2015-06-16   | \$41,000         | Released funds allocated for CUP monitoring in FY14-15 budget in order to re-allocate these funds into the FY15-16 budget for CUP monitoring.                              |
| FY14-15     | Deposit               | Staff              | 2015-07-21   | \$51,903         | Extra revenue received in FY14-15. Actual revenue minus budgeted expenses for FY14-15 (number is updated whenever budget is changed, date reflects most recent update)     |
| FY15-16     | Withdrawal            | Steering Committee | 2015-06-16   | -\$41,000        | Released funds allocated for CUP monitoring in FY14-15 budget in order to re-allocate these funds into the FY15-16 budget for CUP monitoring.                              |
| FY15-16     | Withdrawal            | Steering Committee | 2016-04-25   | -\$20,000        | Released funds for Pathogen Trigger study (TBD) not to exceed \$20K; see description in FY16-17 workplan   |
| FY15-16     | Deposit               | Steering Committee | 2016-04-25   | \$100,000        | SC directed that SFCWA funding of \$100K (contribution for FY15-16) be transferred to reserve.   |
| FY16-17     | Withdrawal            | Steering Committee | 2016-04-25   | -\$100,000       | SC directed that \$100K be withdrawn from the reserve to be reallocated as revenue for FY16-17. SFCWA contribution in Spring 2017 will be allocated to the FY17-18 budget. |
| FY15-16     | Deposit               | Steering Committee | 2016-07-20   | \$84,444         | SC approved that \$84,444 be transferred from FY15-16 revenue to the reserve as undesignated funds.  |
| FY16-17     | Withdrawal            | Steering Committee | 2016-10-18   | -\$10,000        | SC approved up to \$10,000 for coordinating and drafting a response to the External Panel Review. Funds were allocated to FY16-17 Task 1.C.                                |
| FY16-17     | Withdrawal            | Finance Committee  | 2017-05-23   | -\$7,500         | Finance Subcommittee approved transfer of funds to cover final phase of External Review.   |
| FY14-15     | Deposit               | Steering Committee | 2017-07-28   | \$725            | Transferred unused FY14-15 to the Reserve Fund.  |
| FY17-18     | Deposit               | Steering Committee | 2018-03-02   | \$25,910         | SC voted to unencumber the \$25,910 FY15-16 surplus transfer the amount to the Reserve Fund  |
| FY16-17     | Deposit               | Steering Committee | 2018-03-02   | \$8,097          | SC voted to unencumber the \$8,097 FY16-17 surplus and transfer the amount to the Reserve Fund   |
| FY17-18     | Deposit               | Steering Committee | 2018-10-29   | \$37,743         | SC voted to unencumber \$37,743, the surplus from completed tasks in the FY17-18 workplan and transfer these funds to the Reserve Fund.                                    |
|             |                       |                    | <b>Total</b> | <b>\$171,322</b> |  |

## Invoices

Please follow this link to download the invoices covered by this memo:

<https://drive.google.com/drive/folders/108tIjZrjgeU8iIuzNH7QhruwCnfYfG0?usp=sharing>

## **Attachments – Detailed Expense Tables**

See the following pages for detailed tables of expenses by task:

**Table 5. Planned and actual expenses for *uncompleted* tasks authorized in the Delta RMP FY17-18 Workplan, by task and subtask, with details on expenses in the last quarter.**

**Table 6. Planned and actual expenses for tasks authorized in the Delta RMP FY18-19 Workplan, by task and subtask, with details on expenses in the last quarter.**

Table 5. Planned and actual expenses for uncompleted tasks authorized in the Delta RMP FY17-18 Workplan, by task and subtask, with details on expenses in the last quarter.

| Task                                 | Subtask  | Budget    | Total Expense JTD | Budgeted funds remaining | Projected end date for task | Percent of duration elapsed | Percent of budget spent | Expenses in previous quarter | Staff and subcontractors billing  | Description and Notes   |
|--------------------------------------|--|-----------|-------------------|--------------------------|-----------------------------|-----------------------------|-------------------------|------------------------------|---|---|
| 02. Governance                       | D. Science Advisors                                  | \$10,000  | \$9               | \$9,991                  | 2019-06-30                  | 75%                         | 0%                      | \$125                        | Billing in this quarter is to correct a previous incorrect timesheet entry.   | Earmarked for paying honoraria to our science advisors. Delayed in FY17-18 due to the lengthy nomination and selection process.   |
| 04. Communications                   | B. Pulse of the Delta Draft                          | \$40,000  | \$1,178           | \$38,822                 | 2020-10-31                  | 45%                         | 3%                      | \$0                          |   | Most labor deferred; originally planned for FY17-18; SC chose to postpone publication until Fall 2020.  |
| 08. Year 1-2 CUP Interpretive Report | A. Report (subcontract)                              | \$80,000  | \$3,045           | \$76,955                 | 2019-06-30                  | 75%                         | 4%                      | \$0                          |   | Earmarked to pay the consultant Deltares for the Pesticides Interpretive Report. Subcontract in the amount of \$77,450. To date, we have not received any invoices from Deltares. Some spending on ASC labor (\$3,045) occurred before SC made decision to outsource this task. Labor hours were for compiling data and planning the study, including a detailed presentation on proposed analysis methods.<br><br><b>Outputs:</b> Project meeting #3 held with TAC and Pesticides Subcommittee (by internet) on Dec 10, 2018.<br><br><b>Deliverables completed:</b> Presentation at meeting #3, meeting summary. |
|                                      | B. Contract Management (Pesticides Report)           | \$8,000   | \$7,729           | \$271                    | 2019-06-30                  | 75%                         | 97%                     | \$1,685                      | Heberger, Matthew (13.5 hrs)  | <b>Outputs:</b> Following up on action items from meeting on Sept 25, 2018. Answered contractor questions about toxicity data via email. Facilitated communication between Deltares and TAC members.  |
| 09. Nutrients                        | A. Cross-Delta Monitoring Using High Frequency Tools | \$195,000 | \$195,000         | \$0                      | 2019-03-31                  | 86%                         | 100%                    | \$45,928                     | USGS Invoice for \$45,928.  | <b>Outputs:</b> USGS has completed all 3 of the 3 planned high-frequency cruises on May 15-17, 2018, July 24-26, 2018, and October 16-18, 2018. Communication with contractor regarding deadlines and deliverables.<br><br><b>Deliverables completed:</b> None to date. Expected deliverables include (1) draft report, (2) electronic maps, and (3) data files containing results of monitoring cruises.   |
| 10. Mercury Monitoring FY17-18       | A Data Collection and Analysis                       | \$209,016 | \$131,209         | \$77,807                 | 2019-03-31                  | 86%                         | 63%                     | (\$422)                      | Negative entry in this quarter is to correct incorrect billing by staff in the preceding quarter.<br><br>We did not receive any invoices from Moss Landing Marine Laboratory in this quarter. | Earmarked for paying subcontract with Moss Landing Marine Laboratory (MLML).<br><br><b>Outputs:</b> All of the planned sampling events have been completed. Fish data has been submitted by the lab to ASC, and we are still waiting for the water data. ASC pays final invoices once all data has been submitted and passed QA.  |

| Task  | Subtask                      | Budget    | Total Expense JTD | Budgeted funds remaining | Projected end date for task | Percent of duration elapsed | Percent of budget spent | Expenses in previous quarter | Staff and subcontractors billing                    | Description and Notes  |
|---|------------------------------|-----------|-------------------|--------------------------|-----------------------------|-----------------------------|-------------------------|------------------------------|---|--|
|   | B. RMP Data Management       | \$19,545  | \$12,724          | \$6,821                  | 2019-03-31                  | 86%                         | 65%                     | \$1,792                      | Franz, Amy (2.5 hrs)<br>Weaver, Michael (15.25 hrs) | <p><b>Outputs:</b> Checked in, formatted, and QA'ed fish mercury data. Communicated with Moss Landing Marine Laboratory staff regarding issues with TOC measurements.</p> <p><b>Deliverables:</b> None this reporting period. Plan to complete data management and QA of mercury data by Mar 2019. (Deadline extended by 3 months due to delay in receiving data from the lab.)</p>  |
|   | C. Technical Oversight       | \$5,000   | \$2,613           | \$2,387                  | 2019-03-31                  | 86%                         | 52%                     | \$1,180                      | Davis, Jay (5 hrs)<br>Heberger, Matthew (1 hr)      | <p><b>Outputs:</b> Lead scientist reviewed data, corresponded with lab director. Troubleshooting and communications regarding the missing TOC in water data.</p> <p><b>Deliverables:</b> None. Planned deliverable is a draft mercury data report due in Dec 2018, final in March 2019. Remaining hours for the principal investigator to help draft and oversee production of the data report.</p>  |
| 176. CUP Monitoring (authorized in FY16/17) | B. Pesticide Laboratory Work | \$154,029 | \$111,663         | \$42,366                 | 2017-12-31                  | 299%                        | 72%                     | \$0                          |   | <p>Earmarked for paying subcontractor (USGS). <b>Still awaiting final invoices.</b> Lab Director Jim Orlando explained to us that the delay is due to the need to spend down federal funds first, in order to make full use of the 10% cost share on labor and materials that is described in our Joint Funding Agreement.</p> <p><b>Outputs:</b> All planned and contracted lab work has been completed. Still expecting invoices; expect subcontractor to bill for 100% of contract amount, expending this budget line 100%.</p> <p><b>Deliverables:</b> All data has been published in NWIS. Publication in CEDEN is pending SC approval.</p> |
|   |                              | \$720,590 | \$465,170         | \$255,420                |                             |                             | 65%                     | \$50,287                     |   |  |

Table 6. Planned and actual expenses for tasks authorized in the Delta RMP FY18-19 Workplan, by task and subtask, with details on expenses in the last quarter.

| Task               | Subtask                              | Budget   | Total Expense JTD | Budgeted funds remaining | Projected end date for task | Percent of budget spent | Percent of duration elapsed | Expenses in last quarter | Staff and subcontractors billing   | Description and Notes   |
|--------------------|--------------------------------------|----------|-------------------|--------------------------|-----------------------------|-------------------------|-----------------------------|--------------------------|--|---|
| 01. Core Functions | A. Program Planning                  | \$68,250 | \$32,087          | \$36,163                 | 2019-06-30                  | 47%                     | 50%                         | \$14,832                 | Expenses:<br>AMS Invoice, 10/18/2018, \$1,365<br>AMS Invoice, 12/31/2018, \$975<br><br>ASC Labor:<br>Buzby, Nina (5 hrs)<br>Hale, Anthony (1 hrs)<br>Heberger, Matthew (79.75 hrs)<br>Sedlak, Margaret (1.5 hrs)<br>Sutton, Rebecca (10 hrs) | Outputs: Internal coordination, staff meetings, labor planning, oversight and project management. Tracking and updating stoplight reports of action items and deliverables. Pesticides project planning. Invoices paid to consulting statistician for input to pesticides monitoring design.<br><br>Deliverables completed: Updated workplan following SC meeting and addition of pesticides/ planning budgeting for FY18-19. Updated roster in the Charter. Updated Decision Record. |
|                    | B. Contract and Financial Management | \$56,150 | \$24,215          | \$31,935                 | 2019-06-30                  | 43%                     | 50%                         | \$11,983                 | Heberger, Matthew (36 hrs)<br>Hunt, Jennifer (4.5 hrs)<br>Lofthouse, Meredith (72 hrs)   | <b>Outputs:</b> Internal accounting; subcontract management; checked and approved internal and external invoices; tracked expenses by task. Preparation for finance subcommittee on Oct 10, 2018. Continued contract negotiations with Caltrans and DWR.<br><br><b>Deliverables completed:</b> Quarterly finance memo and Finance Committee meeting on Oct 10, 2018.  |
|                    | C. Proposal Writing (Added Oct 2018) | \$8,306  | \$7,285           | \$1,021                  | 2018-10-31                  | 88%                     | done                        | \$7,285                  | Buzby, Nina (24.5 hrs)<br>Gilbreath, Alicia (2.5 hrs)<br>Heberger, Matthew (30 hrs)<br>Hunt, Jennifer (5 hrs)<br>Sutton, Rebecca (3.5 hrs)   | <b>Deliverables completed:</b> Prop 1 grant proposal submitted to Delta Stewardship Council in October 2018. Expect to receive notification in March 2019.  |
| 02. Governance     | A. SC meetings                       | \$38,400 | \$12,781          | \$25,619                 | 2019-06-30                  | 33%                     | 50%                         | \$7,693                  | Expenses:<br>Equipment purchase (HDMI projector cable): \$20.51<br><br>ASC Labor:<br>Davis, Jay (2.5 hrs)<br>Heberger, Matthew (57.25 hrs)   | <b>Outputs:</b> Planned and coordinated 10/29 Joint Meeting. Held two coordinating Committee meetings. Updated decision record and action items tracking sheets. Followup on SC meeting action items. Communications with SC members.<br><br><b>Deliverables completed:</b> Agenda package and meeting summary for SC meeting held on Oct 29, 2018.   |
|                    | B. TAC meetings                      | \$59,400 | \$12,557          | \$46,843                 | 2019-06-30                  | 21%                     | 50%                         | \$5,414                  | Expenses:<br>McCord Environmental<br>Invoices: 10/18/2018, \$1,560<br>11/16/2018, \$1,680<br>11/16/2018, \$960<br><br>ASC Labor:<br>Davis, Jay (2.5 hrs)<br>Heberger, Matthew (5.5 hrs)  | Outputs: Planning for 1/17/2019 TAC meeting. Met with TAC chair and facilitator and Regional Board staff. Prepared materials for agenda package.<br><br>Deliverables completed: Agenda package and summary for joint meeting on Oct 29, 2018.   |

| Task                                  | Subtask                                 | Budget    | Total Expense JTD | Budgeted funds remaining | Projected end date for task | Percent of budget spent | Percent of duration elapsed | Expenses in last quarter | Staff and subcontractors billing   | Description and Notes  |
|---------------------------------------|---|-----------|-------------------|--------------------------|-----------------------------|-------------------------|-----------------------------|--------------------------|--|--|
|                                       | C. Technical Subcommittees              | \$37,000  | \$13,599          | \$23,401                 | 2019-06-30                  | 37%                     | 50%                         | \$5,804                  | ASC Labor:<br>Davis, Jay (6 hrs)<br>Franz, Amy (1.5 hrs)<br>Heberger, Matthew (32.5 hrs)<br>Trowbridge, Philip (1.25 hrs)<br><br>Expenses:<br>Transportation (Amtrak): \$81.00 | <b>Outputs:</b> Planning of and participation in technical subcommittee meetings for:<br>CEC: 10/10/2018, 12/11/2018<br>Mercury: 10/3/2018<br>Nutrients: 11/26/2018<br>Pesticides: 12/10/2018<br><br><b>Deliverables completed:</b> Agendas and Meeting Summaries for 5 meetings noted above.  |
| 03. Quality Assurance                 | A. Quality Assurance                    | \$17,500  | \$11,810          | \$5,690                  | 2019-06-30                  | 67%                     | 50%                         | \$6,480                  | Franz, Amy (4 hrs)<br>Heberger, Matthew (37 hrs)<br>Yee, Donald (8 hrs)  | <b>Outputs:</b> Revised the Delta RMP Quality Assurance Program Plan. Reviewed SWAMP QA Officer comments on the Data Management and Quality Assurance SOP.<br><br><b>Deliverables completed:</b> QAPP version 4.3 finalized and published.   |
|                                       | B. Technical Oversight and Coordination | \$15,000  | \$8,461           | \$6,540                  | 2019-06-30                  | 56%                     | 50%                         | \$2,630                  | Heberger, Matthew (14 hrs)<br>Yee, Donald (5 hrs)  | <b>Outputs:</b> Variety of miscellaneous items related to running a multifaceted monitoring program: Met with staff of State Board Office of Information Management and Analysis to discuss Quality Assurance standards and SWAMP compatibility. Correspondence with Brian Ogg about revisions to toxicity data; Response to QA questions from the Data Management Subcommittee. Coordinated mercury data QA and report writing. Coordinating with field crews and labs re: pesticides sampling.   |
| 04. Nutrients Special Studies FY18-19 | A. Nutrients Modeling Study             | \$186,000 | \$18,283          | \$167,717                | 2020-06-30                  | 10%                     | 25%                         | \$17,123                 | Heberger, Matthew (4.5 hrs)<br>King, Alexandra (138.5 hrs)<br>Trowbridge, Philip (1 hrs)<br>Zhang, Zhenlin (2 hrs)   | <b>Outputs:</b> Lead modeler Allie King:<br>(1) Obtained and compiled the latest version of Delft3D-FM software.<br>(2) Identified the real-life observation stations correspond to the various discharge and withdrawal input files in the USGS's WY2011 in collaboration with staff at USGS Menlo Park. Found and corrected an error in the WY2011 setup. Generated the inflow/withdrawal input files for WY2016.<br>(3) Obtained gate operation info for WY2016 from DWR and input this information into the model<br>(4) Set up the wind model working at SFEI so we can create wind boundary conditions for WY2016. |
|                                       | B. Chlorophyll Inter-calibration Study  | \$42,400  | \$874             | \$41,526                 | 2019-06-30                  | 2%                      | 50%                         | \$0                      |  | No billing in Q2.  |
| 05. Mercury Monitoring FY18-19        | A Data Collection and Analysis          | \$288,711 | \$1,372           | \$287,339                | 2019-06-30                  | 0%                      | 50%                         | \$1,372                  | Bezalel, Shira (1.5 hrs)<br>Ross, John (10 hrs)  | <b>Outputs:</b> Created length-averages of fish mercury data, generated report tables and map.   |

| Task                              | Subtask   | Budget             | Total Expense JTD | Budgeted funds remaining | Projected end date for task | Percent of budget spent | Percent of duration elapsed | Expenses in last quarter | Staff and subcontractors billing  | Description and Notes   |
|-----------------------------------|---|--------------------|-------------------|--------------------------|-----------------------------|-------------------------|-----------------------------|--------------------------|---|---|
|                                   | B. Mercury Data Management and Quality Assurance    | \$29,930           | \$1,321           | \$28,609                 | 2020-03-31                  | 4%                      | 29%                         | \$534                    | Franz, Amy (4.75 hrs)   | <b>Outputs:</b> Processed and uploaded field data for fish and water sampling. Followed up with lab regarding data submittal.<br><br><b>Deliverables completed:</b> None to date.   |
|                                   | C. Technical Oversight and Coordination             | \$5,150            | \$0               | \$5,150                  | 2020-03-31                  | 0%                      | 29%                         | \$0                      |   | <b>Outputs:</b> Created length-averages of fish mercury data, generated report tables and map.  |
| 06. Pesticides Monitoring FY18-19 | A. Field sample collection and laboratory analysis  | \$155,517          | \$0               | \$155,517                | 2019-09-30                  | 0%                      | 40%                         | \$0                      |   | <b>Outputs:</b> First sampling event in Dec 2019. All samples were extracted but chemical analysis was not completed until after the federal government shutdown ended in Jan 2019.   |
|                                   | B. Toxicity reporting                               |                    |                   |                          |                             |                         |                             | \$0                      |   | <b>Subtask cancelled:</b> This subtask was included in the workplan, to provide stakeholders with additional documentation related to toxicity testing, but subsequently cancelled following input by the State Water Board, which manages the contract with the UC Davis toxicity lab. |
|                                   | C. Pesticides Data Management and Quality Assurance | \$40,998           | \$0               | \$40,998                 | 2020-03-31                  | 0%                      | 29%                         | \$0                      |   | <b>Outputs:</b> None. We have not yet received the first batch of data.<br><br><b>Deliverable completed:</b> None to date. ASC will provide provisional data and brief QA summary quarterly.  |
| 07. CEC Monitoring Plan FY18-19   | A. Coordination and planning                        | \$22,000           | \$2,122           | \$19,878                 | 2019-06-30                  | 10%                     | 50%                         | \$1,872                  | Heberger, Matthew (15 hrs)  | <b>Outputs:</b> Project planning and coordination. Phone call with consultants and Regional Board staff. Began contacting agencies regarding opportunities for collaboration or cost sharing. Began contacting labs for quotes.<br><br><b>Deliverables completed:</b> None to date.     |
|                                   | B. QAPP Amendments                                  | \$23,000           | \$474             | \$22,526                 | 2019-06-30                  | 2%                      | 50%                         | \$474                    | Heberger, Matthew (2 hrs)<br>Weaver, Michael (1.25 hrs)<br>Wong, Adam (1 hrs) | <b>Outputs:</b> Labor planning and internal project meeting to discuss expectations, deadlines, etc.<br><br><b>Deliverable completed:</b> None to date.   |
| <b>Total</b>                      |   | <b>\$1,093,712</b> | <b>\$147,239</b>  | <b>\$946,473</b>         | <b>2020-06-30</b>           | <b>13%</b>              | <b>25%</b>                  | <b>\$83,496</b>          |   |   |

# Materials for Agenda Item 5

Date: July 11, 2018 (revised September 12, 2018)

From: Donald Yee, ASC QA Officer and Matthew Heberger, Delta RMP Program Manager

To: Delta RMP Technical Advisory Committee

Re: Review of 2016-2017 Current Use Pesticide QA/QC Data

### **General summary**

This memo summarizes the quality assurance (QA) review of the Delta Regional Monitoring Program (Delta RMP) Fiscal Year 2016–2017 (FY16/17) data for laboratory analyses of pesticides, copper, and ancillary measurements in water. This review was conducted by ASC scientists and technical staff under the supervision of QA Officer Dr. Donald Yee.

All samples were collected and analyzed by scientists and technicians at the U.S. Geological Survey (USGS). Staff of the USGS Pesticide Fate Research Group (PFRG), Organic Chemistry Research Laboratory (OCRL) in Sacramento, CA conducted both the field sampling and lab analyses for pesticides and conventional water quality parameters, under the supervision of Chief Chemist (CC) James Orlando. Samples were analyzed for a suite of Current Use Pesticides (CUP) at OCRL in Sacramento. Sample water was divided and subsamples were shipped to the USGS National Water Quality Laboratory (NWQL) in Denver, CO for analysis of dissolved organic carbon (DOC), particulate organic carbon (POC), and copper. More information about how samples were collected and analyzed can be found in the program's 2016 pesticides data report.<sup>1</sup>

There were 2 DOC field samples not reported. Aside from that, we found that 100% of the lab results for field samples were reportable (not rejected), although most of the pesticides were not detected in most samples.

Copper showed variable recoveries in matrix spikes, deviating more than the QAPP-specified average  $\pm 25\%$  from target values, despite good recovery in lab control samples (a clean matrix).

<sup>1</sup> Jabusch, T., P. Trowbridge, M. Heberger, J. Orlando, M. De Parsia, and M. Stillway. "Delta Regional Monitoring Program Annual Monitoring Report for Fiscal Year 2015–16: Pesticides and Toxicity." Richmond, CA: San Francisco Estuary Institute – Aquatic Science Center, 2018.  
<http://www.sfei.org/documents/delta-pesticides-2016>.

This suggests possible interferences with the copper analysis in natural matrix samples, so field sample results for copper were qualified.

At the end of this memo, Table 1 summarizes the results of the QA review.

## **Approach**

About 20% of all reported records were for quality assurance and quality control purposes.

For this review, we, the project data management team (DMT) and project QA Officer (QAO), used the data electronically submitted by the laboratories and compiled it into a local database to first verify that the correct number of field samples and required number of QC samples are reported for the requested analyses.

We then compared the results for QC samples to the acceptance criteria, or measurement quality objectives (MQOs) listed in the program's Quality Assurance Program Plan (QAPP).<sup>2</sup> We did this by independently recalculating precision (as relative percent difference, RPD, or relative standard deviation, RSD) for lab replicates, and percent recovery for samples with known expected concentrations<sup>3</sup>. In order to verify that contamination of samples had not occurred in sampling or lab analysis, we compared the results for blank samples (both field and lab blanks) to method detection limits. In cases where an analyte is detected in a blank, we compared the measured concentration in the blank sample to concentrations measured in in field samples to determine the proportion of the signal that originates from lab contamination.

Where deviations from the project MQOs were found, we attached a flag or qualifier to the record. In some cases, records may have already been flagged by the reporting lab. Qualifiers added by ASC or the lab indicate that there has been a deviation from the project's quality criteria, and are meant to warn data users that certain records may be inaccurate or imprecise, or otherwise may need to be interpreted with caution. When the code is added by ASC rather than by the lab, it is preceded by a 'V'.

If data not meeting MQOs were not flagged by the laboratory, the DMT and QAO communicate with the laboratory to verify the reported data contain no transcription errors, missed

<sup>2</sup> Jabusch, Thomas, Don Yee, and Amy Franz. "Delta Regional Monitoring Program Quality Assurance Program Plan, Version 2.2." San Francisco Estuary Institute – Aquatic Science Center, September 30, 2016.

[https://www.waterboards.ca.gov/centralvalley/water\\_issues/delta\\_water\\_quality/delta\\_regional\\_monitoring/wq\\_monitoring\\_plans/2016\\_0930\\_drmp\\_qapp.pdf](https://www.waterboards.ca.gov/centralvalley/water_issues/delta_water_quality/delta_regional_monitoring/wq_monitoring_plans/2016_0930_drmp_qapp.pdf).

<sup>3</sup> Most labs calculate these metrics as a part of their internal QA, to identify lab performance outside of their usual controls. We request labs submit these metrics along with the data, however, we independently recalculate them to identify issues such as miscoded samples or transcription errors.

conversions or similar errors. If necessary, corrections are made to the data during this process. Otherwise, the data are flagged by the QAO (QA codes in the database that start with letter "V" are applied by QAO rather than the lab). Systematic problems with the analysis or reporting of data are discussed with the lab to identify appropriate corrective actions for either re-reporting the samples or for future analyses. In the most severe cases, data may be rejected and not reported. However, for this project, all data were reportable, as we did not find serious violations of the quality objectives that would lead to rejection of data.

A more detailed narrative of the review of QC data submitted by the labs is presented below.

## **USGS OCRL – Current Use Pesticides**

The section below describes the QA of current use pesticide data analyzed at the USGS Organic Chemistry Research Laboratory (OCRL). See Table 1 at the end of this memo for a summary of the QA review.

### **General findings and *recommended actions***

All of the laboratory data were reportable (not rejected) for the target analytes.

There was initially low precision (RPD > 70%) for two pesticides, due to the mistaken reporting by the lab of field blanks as being field replicates. There were also results sporadically omitted from submissions requiring followup to determine the reasons for omission. Recoding and resubmission of the data fixed these errors, but created extra work, first in finding the seemingly low precision, then in reanalyzing the QC after the resubmission. *The lab should work on internal procedures to better ensure that the submitted data is both complete and matches what they have recorded internally.*

### **Completeness**

All of the expected results were reported by the lab. Results were reported for 152 compounds in dissolved phase and 130 in particulate phase. The lab reported all expected results from regular field samples (for each analyte: n = 60, 12 monthly samples at 5 stations) plus field replicates (minimum 5% frequency or n = 3 samples for each analyte).

Blanks and matrix spikes/duplicates (MS/MSDs) were also reported at a minimum 5% frequency (3 or more of each). For MS/MSDs this is in accordance with the DRMP QAPP, but for blanks this may be less than 1 per 20 "or batch". Batches without blanks were therefore flagged in BatchVerificationCode "VQI" for incomplete QC. All pesticides were non-detect in all blanks, so the impact of fewer blanks may not be severe.

### **Hold times**

All of the samples were prepared/preserved within less than 24 hours, well within the 48 hour hold time limit. Samples were analyzed within the QAPP required 30 days after preparation so no results were flagged for hold time.

## **Sensitivity**

About 80% of the target analytes were non-detect in all the dissolved or particulate samples. About 18% of pesticides were detected in less than half the samples, with only 2% of the analytes detected in half or more of the samples. This is expected, as most pesticides, if used properly, should only be found at low concentrations in the environment. Records in the database with results below their respective MDLs (reported in the same record) should not be regarded as fully quantitative as explained in the following paragraph.

The OCRL computes method detection limits (MDLs) for pesticide compounds it analyzes following standard analytical chemistry methods as outlined in two publications.<sup>4</sup> Chemists at the OCRL follow best practice in reporting results when they can be reasonably certain the compound is present in the sample, even when the concentration of a chemical is below the calculated and published MDL. These results have a greater uncertainty, and data users are cautioned that the result should be considered an estimate. This communication is done via the database in two ways. First, the database field ResultQualCode is assigned the value "ND" for non-detect. Second, the field QACode is assigned the value JA (Analyte positively identified but quantitation is an estimate) or JDL (Estimated result lower than detection limit). In total, 86 results were reported but flagged because the result was lower than the MDL. These results accounted for less than 0.5% of the 18,754 chemistry results.

## **Blank contamination**

Accurate measurement of analytes at low concentrations sometimes requires correcting for background sources of contamination, such as traces in reagents, solvents, glassware, or other sample processing hardware used in the analysis. Analyzing "method blanks" or "lab blanks" lets us demonstrate that these materials are free from contamination that would interfere with analysis of the sample. No pesticides were found in any of the lab blank or field blank samples. Therefore, no blank qualifiers were needed. All pesticides results are reported without blank correction.

Results less than three times the computed concentration in a blank have a high probability of not being quantitative, as the measured blank(s) can account for a third or possibly more of the

<sup>4</sup> Hladik, Michelle, Kelly L. Smalling, and Kathryn Kuivila. "Methods of Analysis-Determination of Pyrethroid Insecticides in Water and Sediment Using Gas Chromatography/Mass Spectrometry." Techniques and Methods 5 – C2. US Geological Survey, 2009. <https://pubs.usgs.gov/tm/tm5c2/tm5c2.pdf>.

Hladik, Michelle, and Daniel L. Calhoun. "Analysis of the Herbicide Diuron, Three Diuron Degradates, and Six Neonicotinoid Insecticides in Water-Method Details and Application to Two Georgia Streams." Scientific Investigations Report 2012–5206. US Geological Survey, 2012. <https://pubs.usgs.gov/sir/2012/5206/pdf/sir20125206.pdf>.

total signal. Table 1 shows that no results were  $<3x$  the blank, so it is unlikely that a majority of the total signal in any sample is from blank contamination.

### **Precision**

The precision of analysis methods (ability to consistently obtain the same result) is determined by analyzing replicate samples. The lab analyzed “laboratory replicates” (where the field sample is split in the laboratory and each subsample is analyzed separately) to assess the repeatability of measurements. Further, field crews collected “field replicates” (two or more samples collected in the same place at the same time) to demonstrate lack of contamination in the field. For most analytes, we would like replicate samples to be within 25% (RPD or RSD) of one another; the acceptance ranges are specified as the MQOs in the QAPP Table 4.3. However, most analytes were never detected in any sample, so we could not estimate precision for those in unspiked field samples.

Because of this, we evaluated precision primarily based on the results of matrix spike duplicates (MSDs), where two samples are each spiked with a known amount of a contaminant. In general, we found that there was a good agreement between these paired samples, with an average RPD of 15% or less for all analytes, well within the target 25%.

Azoxystrobin and boscalid initially had RPDs over 100%, due to samples with switched IDs. This was corrected on a later resubmission.

Table 1 reports the range of precision estimates for the various analyte groups. Rather than reporting the QA measurement for all 152 pesticide analytes, we have reported the average and the range for the compounds in the particulate phase, and in the dissolved phase measured with different instruments and methods (LC/MS vs. GC/MS). We estimated precision using the relative percent difference (RPD) when only a pair of replicates for a given sample. However, when there are 3 or more replicates, there are multiple pairwise comparisons possible, so we report relative standard deviation (RSD) instead as an indicator of the spread of the distribution in measurements. (The use of both RPD and RSD to measure precision follows SWAMP protocols.)

### **Accuracy**

We estimate the lab’s accuracy, or the closeness of a measured result to an accepted reference value by measuring the percent recovery of a compound in a sample that is “spiked” with a known quantity of a chemical. Recoveries were evaluated from matrix spike samples, with average deviation less than the 25% target limit in the QAPP. Therefore, we did not flag any results for recovery problems. This provides evidence that the results of the lab analysis are reasonably accurate.

### **Comparison to previous data**

As a final check on the data, we compare the results to those from similar studies, or to results from previous years. This is a qualitative check that lets us see whether results are out of the ordinary and may require some followup investigation. In general, the lab results for pesticide measurements were consistent with those found in year 1. Of the 10 analytes that were detected in more than half the samples in the first year, 6 were also found in more than half the samples in Year 2, and the remaining 4 were detected in between 25 to 50% of samples.

### **Other Analytes – DOC, POC, Copper, and TSS**

The following section gives a summary of the QA for analytes other than pesticides. These include analyses performed by the USGS National Water Quality Laboratory (NWQL) in Denver, Colorado for dissolved organic carbon (DOC), particulate organic carbon (POC), and copper. This section also describes the QA for total suspended solids (TSS) analyzed by the Organic Chemistry Research Laboratory (OCRL) in Sacramento.

#### **General findings and *recommended actions***

Nearly all of the field data were reportable for the target analytes. We did not reject or censor any data because of quality concerns, but two expected records were lost in processing and not reported by the lab, with insufficient material for reanalysis. Both missing records were for DOC. According to the lab manager, these samples were lost during sample processing at the NWQL. Reruns of the samples were requested but there was not enough sample material remaining. *To diagnose and help prevent future occurrences, reports should be sent to the PM after each sampling round with counts of all field samples and field QC provided to analytical labs. The data manager should also check preliminary submissions for counts (as well as other QC sample types) and confirm with submitting lab, to minimize piecemeal additions of missing data and reformatting/re-evaluation.* Matrix spike recoveries for copper were variable, despite good recoveries on lab control (blank) spikes, suggesting possible interference in analysis of natural matrix samples.

#### **Hold time**

Hold time was met for all analyses so no added flags were needed.

#### **Completeness**

The dataset includes 60 site event combinations (12 months, 5 sites) for 2016–2017, reported for POC, copper, and TSS. The lab failed to report two expected results for DOC (~3% of the expected total). Missing samples were:

- At Ulatis Creek at Brown Road (site code 511ULCABR) on 2016-07-13
- At Mokelumne River at New Hope Road (site code 544SAC002) on 2016-08-17

The lab reported three or more filter blanks and laboratory control samples (LCSs), with the number of filter blanks varying by analyte, meeting or exceeding the required 1 per 20 (5%) frequency in the QAPP, but not necessarily the “or batch” condition. Thus batches without blanks or recovery samples were therefore flagged in BatchVerificationCode “VQI” for incomplete QC. Blanks were nearly all non-detects, and recovery for most analytes met QAPP targets, so the impact of fewer QC samples may not be severe.

The lab only submitted only 2 MS/MSD pairs for copper. This is one less of each type of QA sample than specified in the QAPP. We have communicated this with the lab. There may have been confusion resulting from initial submission of the first 3 months of Year 2 data with Year 1, and erroneously counting of some of those samples as applying to Year 2.

Feld replicates were reported (at 5% frequency,  $n = 3$ ) for DOC, POC, and copper, and TSS, and 3 or more lab replicates (of field grab samples) were reported for copper and DOC. *The project manager should monitor the minimum number of field replicates noted by field crews, and the data manager should check preliminary submissions for counts (as well as other QC sample types) and confirm with submitting lab.*

### **Sensitivity**

Methods were generally sufficient to quantify the target conventional and metal analytes in nearly all the samples; only total nitrogen, a non-target analyte was ND in 3% of samples.

### **Blank contamination**

A trace amount of copper was detected in one of the filter blanks at 0.32  $\mu\text{g/L}$ , just above the MDL of 0.2  $\mu\text{g/L}$ . Since all field sample copper concentrations were at least 3x higher than the blank result in that batch (which contained the Dec 2016 and Jan 2017 samples), those results were flagged for blank contamination (VIP flag) but not censored.

### **Precision**

Variation among TSS field replicates was greater than sought in the QAPP, averaging RPD ~31%, over the 25% target. The project manager should continue to work in conjunction with field crews and labs to discuss alternative sampling and subsampling methods and strategies to minimize variation in TSS. Otherwise, the variation in TSS may make it of limited use for interpreting site characteristics and processes. RPDs on replicates averaged less than 10% for DOC and copper, and less than 25% for POC, meeting the QAPP requirements. Precision on MS and laboratory control samples (LCS) replicates was similar or even better, averaging <10% RPD for both DOC and copper.

### **Accuracy**

LCS recoveries were generally good for DOC, with average errors <10%, well within the targets specified in the QAPP. There were no LCS or other recovery samples for POC, but TPC (total particulate carbon) recoveries would be most analogous, and also averaged <10% error.

However, although average copper recovery in MS/MSD samples was 122%, it was variable, with average deviation of 32%, greater than the 25% target in the QAPP. Copper LCS samples had much better recovery, averaging 3% error, suggesting the problem is an interference found only in natural matrix samples. All copper results were therefore flagged but not censored for recovery deviations.

### **Dissolved and particulate phases**

Of the conventional analytes, only organic carbon was analyzed in more than one fraction (dissolved and particulate). DOC was generally > POC, with median and mean ratios of around 5:1. However, a few samples had POC > DOC, which might be needed to interpret if anomalies are found in field data for pesticides and other pollutant chemicals at those sites.

### **Comparison to previous data**

Average results for DOC and copper are consistent with those found in year 1, but POC and TSS averaged about 40% lower than prior results; since the latter are both particulate phase, similar/proportional differences would be expected.

**Table 1. Summary of QA data**

| Method   | Fraction    | Analyte                                 |                      | % Exceeding hold time | % Non-detects | % Results <3x Blank | Average % Recovery for Matrix Spike Samples <sup>1</sup> | Acceptable range for recovery (MQO in QAPP) | Precision: Average RPD or RSD for Duplicate Samples <sup>9</sup> | Acceptable range for precision (MQO in QAPP) |
|--|-------------|---|----------------------|-----------------------|---------------|---------------------|--|---|--|--|
| Hladik and Calhoun, 2012<br>(analyzed by LC/MS/MS) | Dissolved   | Pesticides                              | minimum <sup>2</sup> | 0%                    | 22%           | 0%                  | 77%  | 70% - 130%                                  | 2.6%   | < 25%  |
|  |             |   | average <sup>3</sup> | 0%                    | 85%           | 0%                  | 90%  |   | 5.4%   |  |
|  |             |   | maximum <sup>2</sup> | 0%                    | 100%          | 0%                  | 105%   |   | 8.3%   |  |
| Hladik, et. al., 2008<br>(analyzed by GC/MS)       | Dissolved   | Pesticides                              | minimum              | 0%                    | 24%           | 0%                  | 77%  | 70% - 130%                                  | 1.0%   | <25%   |
|  |             |   | average              | 0%                    | 96%           | 0%                  | 97%  |   | 4.2%   |  |
|  |             |   | maximum              | 0%                    | 100%          | 0%                  | 109%   |   | 9.9%   |  |
| Hladik, et. al., 2008<br>(analyzed by GC/MS)       | Particulate | Pesticides                              | minimum              | 0%                    | 90.5%         | 0%                  | 79%  | 70% - 130%                                  | 0.7%   | <25%   |
|  |             |   | average              | 0%                    | 99.88%        | 0%                  | 93%  |   | 4.1%   |  |
|  |             |   | maximum              | 0%                    | 100%          | 0%                  | 104%   |   | 12%  |  |
| USGS I-2020-05                                     | Dissolved   | Copper                                  |                      | 0%                    | 0%            | 0%                  | 122%   | 75% - 125%                                  | 7.4%   | < 25%  |
| METH011.00   | Dissolved   | Dissolved Organic Carbon <sup>4</sup>   |                      | 0%                    | 0%            | 0%                  | 103%   | 80% - 120%                                  | 10%  | < 25%  |
| EPA 440  | Particulate | Carbon, Total                           |                      | na <sup>6</sup>       | 0%            | 0%                  | 99%  | not stated <sup>8</sup>                     | 21%  | not stated <sup>8</sup>                      |
| EPA 440  | Particulate | Nitrogen, Total                         |                      | na <sup>6</sup>       | 3%            | 0%                  | 99%  | not stated <sup>8</sup>                     | 1.5%   | not stated <sup>8</sup>                      |
| EPA 440  | Particulate | Particulate Organic Carbon <sup>5</sup> |                      | 0%                    | 0%            | 0%                  | na <sup>7</sup>  | na <sup>7</sup>                             | 21%  | < 25%  |
| EPA 440  | Particulate | Total Inorganic Carbon                  |                      | na <sup>6</sup>       | 94%           | 0%                  | na <sup>7</sup>  | na <sup>7</sup>                             | na <sup>10</sup>   | not stated <sup>8</sup>                      |
| EPA 160.2M/Calculated                              | Particulate | Total Suspended Solids                  |                      | 2%                    | 0%            | 0%                  | na <sup>7</sup>  | na <sup>7</sup>                             | 31%  | < 25%  |

<sup>1</sup>Average % recovery across all batches, calculated by averaging the average recoveries from all individual batches.  
Minimum and maximum % average recoveries represent the analytes with the lowest and highest average of averages.

<sup>2</sup>"Average" pesticide results for all analytes within the method considered collectively.

<sup>3</sup>"Min" and "Max" results for individual compounds, e.g., the fewest NDs for any one compound by LC/MS/MS was 25.4%, while the most was 100%ND (this occurred for many individual compounds, given that the average is 85.07%ND).

<sup>4</sup>DOC samples were used to represent lab recovery and precision for all dissolved carbon species.

<sup>5</sup>Total particulate carbon samples were used to represent lab recovery and precision for particulate carbon species.

<sup>6</sup>No hold time requirements listed for total carbon, total nitrogen, or total inorganic carbon.

<sup>7</sup>No spiked samples were analyzed for particulate organic carbon, total inorganic carbon, or total suspended solids, nor were any required by the QAPP. Although matrix samples can be spiked to measure recovery, it is not commonly done by analytical labs. Recovery of particulate total carbon provides some indication of measurement accuracy for the other carbon species.

<sup>8</sup>No MQO listed in the QAPP for total carbon or total nitrogen. These were not "target parameters" of our study, but are analyzed by the lab in the course of performing other analyses and reported at no cost to us, and are reported here for the sake of completeness.

<sup>9</sup>Lab replicates were used to calculate precision by preference; for some pesticide analytes, where lab replicates were all non-detects, precision was calculated using field replicates.

<sup>10</sup>No replicates were analyzed or usable. For total inorganic carbon only field replicates were analyzed and all results were non-detect, so RPD/RSD could not be calculated.

# Materials for Agenda Item 6

# Delta RMP Deliverables

## Key to Status Colors:

Checkmark indicates complete.

Green indicates that there are over 90 days until the deliverable is due.

Yellow indicates a deliverable is due in less than 90 days.

Red indicates a deliverable that is overdue.

| Task | Deliverable   | Assigned To  | Due Date         | Status   | Comments |  |
|------|---|--|------------------|----------|----------|--|
| 1    | <input type="checkbox"/> FY17/18 Delta RMP Workplan                         |  |                  |          |          |  |
| 2    | <input type="checkbox"/> 3. Quality Assurance                               |  |                  |          |          |  |
| 3    | 3.A. Quality Assurance  | Revised QAPP for FY18/19   | Matthew Heberger | 09/30/18 | ✓        | Distributed to signatories on Nov 21, 2018.  |
| 4    | 3.A. Data Management and QA Standard Operating Procedures                   | Submit Standard Operating Procedures (due to SWAMP QAO on July 1, 2018)  | Matthew Heberger | 06/30/18 | ✓        | Requested by Melissa Morris, SWAMP QA Officer, as a condition of approving QAPP.   |
| 5    | 4. Communications   | "Pulse of the Delta" Draft   | Matthew Heberger | 06/30/20 | ●        | As of Dec 2018, the SC has approved the main themes and an outline. SC decided to push back publication of report to 2020. Note that budget does not include layout or design. |
| 6    | <input type="checkbox"/> 8. Pesticides Interpretive Report                  |  |                  |          |          |  |
| 7    | 8.B. Contract Management  | RFP for Pesticides/Toxicity Interpretive Report  | Matthew Heberger | 11/15/17 | ✓        | RFP issued in in spring 2018, proposals due March 16.  |
| 8    | 8.B. Contract Management  | Signed contract and scope of work  | Matthew Heberger | 03/31/18 | ✓        |  |
| 9    | <input type="checkbox"/> 8.A. Interpretive Report (Deltares)                |  |                  |          |          |  |
| 10   | <input type="checkbox"/> 8.A.1. Stakeholder Engagement & Input              |  |                  |          |          |  |
| 11   | 8.A.1. Stakeholder Engagement & Input                                       | M1.1. Meeting #1: Kickoff meeting with contract manager (ASC)  | Erwin Roex       | 07/01/18 | ✓        | Kickoff meeting between Matt and Erwin held on July 12, 2018 via Skype.  |
| 12   | 8.A.1. Stakeholder Engagement & Input                                       | M1.2. Meeting #2, In-person with stakeholders to discuss overall approach and data compilation   | Erwin Roex       | 09/25/18 | ✓        | Meeting held on morning of Sept 25 at Regional San.  |
| 13   | 8.A.1. Stakeholder Engagement & Input                                       | D1.3. Presentation at stakeholder meeting #2   | Erwin Roex       | 09/25/18 | ✓        | Erwin's Powerpoint slide presentation was distributed to the Pesticides Subcommittee and TAC following the meeting.  |
| 14   | 8.A.1. Stakeholder Engagement & Input                                       | D1.4 Minutes of stakeholder meeting #2   | Erwin Roex       | 10/15/18 | ✓        | Matt H. wrote up a meeting summary, saving Deltares from having to complete this step.   |
| 15   | 8.A.1. Stakeholder Engagement & Input                                       | M1.3. Meeting #3, In-person meeting with Deltares to present data and methods to TAC   | Erwin Roex       | 12/10/18 | ✓        | Postponed to Dec 10, 2018.   |
| 16   | 8.A.1. Stakeholder Engagement & Input                                       | D1.5 Presentation at meeting #3  | Erwin Roex       | 12/10/18 | ✓        |  |
| 17   | 8.A.1. Stakeholder Engagement & Input                                       | D1.6 Minutes of meeting #3   | Erwin Roex       | 12/17/18 | ✓        |  |
| 18   | 8.A.1. Stakeholder Engagement & Input                                       | M1.4. Meeting #4: Teleconference to discuss Draft Report   | Erwin Roex       | 03/31/19 | ●        |  |
| 19   | 8.A.1. Stakeholder Engagement & Input                                       | D1.7 Presentation at Meeting #4  | Erwin Roex       | 03/31/19 | ●        |  |
| 20   | 8.A.1. Stakeholder Engagement & Input                                       | D1.8 Minutes of Meeting #4   | Erwin Roex       | 04/15/19 | ●        |  |
| 21   | <input type="checkbox"/> 8.A.2. Compilation of existing data and literature |  |                  |          |          |  |
| 22   | 8.A.2. Compilation of existing data and literature                          | D 2.1: Summary of the definitive data set.   | Erwin Roex       | 12/24/18 | ✓        | As of Oct 19, 2018, State Board staff are still making adjustments to the Delta RMP toxicity data, preventing Deltares from finalizing their analysis.                         |
| 23   | 8.A.2. Compilation of existing data and literature                          | D 2.2: Excel file containing the definitive database with both pesticide and toxicity results to be used in further analysis.                            | Erwin Roex       | 12/24/18 | ✓        |  |
| 24   | 8.A.2. Compilation of existing data and literature                          | D 2.3: Technical memo describing the principles, methodology and metadata used to construct the final database and displaying some basic visualizations. | Erwin Roex       | 12/24/18 | ✓        |  |
| 25   | <input type="checkbox"/> 8.A.3. Analysis Methods Report                     |  |                  |          |          |  |
| 26   | 8.A.3. Analysis Methods Report  | D 3.1. Updated list of water quality thresholds  | Erwin Roex       | 01/15/19 | ●        | Per Erwin Roex, expected to deliver by end of February 2019.   |
| 27   | 8.A.3. Analysis Methods Report  | D 3.2 Draft memorandum on analytical methods to be used  | Erwin Roex       | 01/15/19 | ●        |  |

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| Task | Deliverable  | Assigned To   | Due Date          | Status   | Comments |   |
|------|--|---|-------------------|----------|----------|---|
| 28   | 8.A.3. Analysis Methods Report                               | D 3.3: Final memorandum on analytical methods to be used  | Erwin Roex        | 12/31/18 |          |   |
| 29   | <input type="checkbox"/> 8.A.4. Interpretive Report          |   |                   |          |          |   |
| 30   | 8.A.4. Interpretive Report                                   | D4.1 First Draft Report   | Erwin Roex        | 01/31/19 |          | Shown in their proposal as due in Nov, but changed to Jan. It doesn't make sense for them to issue a draft of the report until they have agreement on the analysis methods, to be discussed in Nov and finalized in Dec.  |
| 31   | 8.A.4. Interpretive Report                                   | D4.2 Final Draft Report   | Erwin Roex        | 03/31/19 |          |   |
| 32   | 8.A.4. Interpretive Report                                   | D4.3 Final Report   | Erwin Roex        | 05/31/19 |          |   |
| 33   | <input type="checkbox"/> 9. Nutrients Special Studies        |   |                   |          |          |   |
| 34   | 9.A. Cross-Delta Monitoring Using High-Frequency Tools       | Report from USGS on Cross-Delta High Frequency Monitoring Project                               | Brian Bergamaschi | 03/31/19 |          | The Nutrients Subcommittee decided to postpone the project so all 3 cruises will happen in Water Year 2018, commencing in spring, once flows recede. This delay sets the deadline for the final report as early 2019 as a draft. The final report will include a discussion of how the HF data should be used in the context of other monitoring data.  |
| 35   | 9.A. Cross-Delta Monitoring Using High-Frequency Tools       | Electronic versions of maps produced by the project   | Brian Bergamaschi | 03/31/19 |          |   |
| 36   | 9.A. Cross-Delta Monitoring Using High-Frequency Tools       | Data files containing constituent concentration data and location information                   | Brian Bergamaschi | 03/31/19 |          |   |
| 37   | 9.B. Continued Nutrient Data Analysis and Biennial Reporting | Prepare, coordinate, and provide technical support to up to 4 nutrient subcommittee meetings    | Philip Trowbridge | 06/30/18 |          | Meetings held on 9/29/17, 12/1/17, 1/18/18, 2/15/18. 4 project proposals for FY18/19 were developed.  |
| 38   | 9.B. Continued Nutrient Data Analysis and Biennial Reporting | Outline for biennial synthesis report to be completed in FY18/19                                | Philip Trowbridge | 06/30/18 |          | Proposal prepared for Nutrient Subcommittee. The Subcommittee set this project as a low priority for further action.  |
| 39   | 9.B. Continued Nutrient Data Analysis and Biennial Reporting | Design additional statistical analyses to be completed in FY17/18                               | Philip Trowbridge | 09/30/17 |          | This task was a placeholder for any follow-on analyses after the three synthesis reports were completed. The subcommittee did not authorize any additional statistical analyses so this task no longer relevant.  |
| 40   | 9.B. Continued Nutrient Data Analysis and Biennial Reporting | Complete additional statistical analyses and prepare technical report                           | Philip Trowbridge | 12/31/17 |          | This task was a placeholder for any follow-on analyses after the three synthesis reports were completed. The subcommittee did not authorize any additional statistical analyses so this task no longer relevant.  |
| 41   | 9.C. Chlorophyll Sensor Intercalibration                     | Prepare, coordinate, and facilitate Phase 1 Technical Team Meetings                             | Philip Trowbridge | 06/30/18 |          | 3 meetings held on 9/28/17 and 12/5/17 and 2/6/18.  |
| 42   | 9.C. Chlorophyll Sensor Intercalibration                     | Develop Phase 2 Project Plan, including study design, logistics, and institutional coordination | Philip Trowbridge | 06/30/18 |          | Proposal for Phase II study prepared and presented to the SC on 5/11/18.  |
| 43   | <input type="checkbox"/> 10. Mercury Monitoring              |   |                   |          |          |   |
| 44   | 10.B. Mercury Monitoring                                     | Mercury Data Uploaded to CEDEN  | Amy Franz         | 01/31/19 |          | As of Sept 2018, MOST FY17/18 data has been received from the lab. Data management will not marked as complete until QA is complete and data is uploaded to CEDEN.<br><br>Update Nov 2018: MLML reports that there were problems with the TOC data (broken/malfunctioning equipment). They sent samples to an external, commercial lab to analyze for TOC. These data are not expected to be reported to her until early December.<br><br>Matt (ASC project manager) instructed ASC data services team to delay doing the data management and QA of this dataset, so that it can all be done together, rather than processing two separate datasets, which would result in extra time and expense. (TOC is an important ancillary parameter for interpreting the mercury results, and I decided that even though we have 99% of the data, it did not make sense to move forward with an incomplete dataset.) New timeline to complete the QA is about mid-January taking into account planned time off for staff around the holidays.<br><br>Update 2/13/2019: Moss Landing delivered the data and ASC will fast track Data Management and Quality Assurance. |
| 45   | 10.B. Mercury Monitoring                                     | Mercury QA Memo   | Don Yee           | 01/31/19 |          | As of Jan 2019, QA is complete for the fish tissue data, but we are waiting for the complete results for water and sediment.  |
| 46   | 10.C. Technical Coordination                                 | Draft Mercury Data Report   | Jay Davis         | 01/31/19 |          | See note above about pushing back deadline by 2 months in order to wait for the full dataset and avoid going over budget.   |
| 47   | 10.C. Technical Coordination                                 | Final Mercury Data Report   | Jay Davis         | 03/31/19 |          |   |
| 48   |  |   |                   |          |          |   |
| 49   | <input type="checkbox"/> FY18/19 Delta RMP Workplan          |   |                   |          |          |   |
| 50   | <input type="checkbox"/> 1. Program management               |   |                   |          |          |   |
| 51   | A. Program planning  | Detailed Workplan and Budget for FY19/20  | Matthew Heberger  | 05/01/19 |          |   |
| 52   | A. Program planning  | Updated Communications Plan (if necessary)  | Matthew Heberger  | 06/30/19 |          |   |
| 53   | A. Program planning  | Updated Monitoring Design Summary (if necessary)  | Matthew Heberger  | 06/30/19 |          |   |
| 54   | A. Program planning  | Amended Charter (if necessary)  | Matthew Heberger  | 12/31/18 |          | Some charter amendments were made at the Oct 29, 2018 SC meeting. Charter was amended and posted on the website.  |
| 55   | A. Program planning  | Quarterly Report #1 on Deliverables and Action Items  | Matthew Heberger  | 09/30/18 |          |   |

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| Task | Deliverable   | Assigned To  | Due Date         | Status   | Comments |  |
|------|---|--|------------------|----------|----------|--|
| 56   | A. Program planning   | Quarterly Report #2 on Deliverables and Action Items   | Matthew Heberger | 12/31/18 | ✓        | This will accompany the SC meeting package and finance memo.   |
| 57   | A. Program planning   | Quarterly Report #3 on Deliverables and Action Items   | Matthew Heberger | 03/31/19 | ●        |  |
| 58   | A. Program planning   | Quarterly Report #4 on Deliverables and Action Items   | Matthew Heberger | 06/30/19 | ●        |  |
| 59   | <input type="checkbox"/> B. Contract and financial management     |  |                  |          |          |  |
| 60   | B. Contract and financial management                              | Quarterly finance update #1  | Matthew Heberger | 10/08/18 | ✓        |  |
| 61   | B. Contract and financial management                              | Quarterly finance update #2  | Matthew Heberger | 02/01/19 | ✓        |  |
| 62   | B. Contract and financial management                              | Quarterly finance update #3  | Matthew Heberger | 05/01/19 | ●        |  |
| 63   | B. Contract and financial management                              | Quarterly finance update #4  | Matthew Heberger | 06/30/19 | ●        |  |
| 64   | B. Contract and financial management                              | Invoices to Delta RMP participants/contributors  | Matthew Heberger | 05/15/19 | ●        | In addition, invoices will be sent as needed to any new Delta RMP participants that may join during the year.                                    |
| 65   | B. Contract and financial management                              | New or extended contracts for those Delta RMP participants that require a contract in order to pay ASC | Matthew Heberger | 06/30/19 | ●        | Participants requiring a contract include Regional San, Caltrans, State Water Contractors (formerly SFCWA)                                       |
| 66   | B. Contract and financial management                              | Contracts with subcontractors, labs  | Matthew Heberger | 06/30/19 | ●        | After the workplan has been approved by the SC, put in place contracts with any labs, contractors. USGS, MLML, McCord, Orzalli, AMS, and others. |
| 67   | <input type="checkbox"/> 2. Governance                            |  |                  |          |          |  |
| 68   | <input type="checkbox"/> A. Steering Committee meetings           |  |                  |          |          |  |
| 69   | Coordinating Committee Pre-Call #1                                | Agenda and informal summary  | Matthew Heberger | 06/15/18 | ✓        |  |
| 70   | Coordinating Committee Post-Call #1                               | Agenda and informal summary  | Matthew Heberger | 07/31/18 | ✓        |  |
| 71   | Coordinating Committee Pre-Call #2                                | Agenda and informal summary  | Matthew Heberger | 10/15/18 | ✓        |  |
| 72   | Coordinating Committee Post-Call #2                               | Agenda and informal summary  | Matthew Heberger | 11/15/18 | ✓        |  |
| 73   | Coordinating Committee Pre-Call #3                                | Agenda and informal summary  | Matthew Heberger | 01/15/19 | ✓        |  |
| 74   | Coordinating Committee Post-Call #3                               | Agenda and informal summary  | Matthew Heberger | 02/28/19 | ●        |  |
| 75   | Coordinating Committee Pre-Call #4                                | Agenda and informal summary  | Matthew Heberger | 05/15/19 | ●        |  |
| 76   | Coordinating Committee Post-Call #4                               | Agenda and informal summary  | Matthew Heberger | 06/15/19 | ●        |  |
| 77   | SC Meeting #1 (2018-07-17)  | Agenda Package   | Matthew Heberger | 07/07/19 | ✓        |  |
| 78   | SC Meeting #1 (2018-07-17)  | Meeting Summary  | Matthew Heberger | 09/28/18 | ✓        |  |
| 79   | SC Meeting #2 (2018-10-29)  | Agenda Package   | Matthew Heberger | 10/14/18 | ✓        |  |
| 80   | SC Meeting #2 (2018-10-29)  | Meeting Summary  | Matthew Heberger | 12/28/18 | ✓        |  |
| 81   | SC Meeting #3 (2019-02-22)  | Agenda Package   | Matthew Heberger | 01/15/19 | ●        |  |
| 82   | SC Meeting #3 (2019-02-22)  | Meeting Summary  | Matthew Heberger | 03/29/19 | ●        |  |
| 83   | SC Meeting #4 (May 2019)  | Agenda Package   | Matthew Heberger | 05/31/19 | ●        |  |
| 84   | SC Meeting #4 (May 2019)  | Meeting Summary  | Matthew Heberger | 06/28/19 | ●        |  |
| 85   | SC Teleconference (as necessary)                                  | Agenda Package   | Matthew Heberger | 06/28/19 | ●        |  |
| 86   | SC Teleconference (as necessary)                                  | Meeting Summary  | Matthew Heberger | 06/28/19 | ●        |  |
| 87   | <input type="checkbox"/> B. Technical Advisory Committee meetings |  |                  |          |          |  |
| 88   | TAC Meeting #1 (2018-09-21)                                       | Agenda Package   | Matthew Heberger | 09/14/18 | ✓        | Meeting held on Sept 21, 2018. Agenda package sent on Sept 17.   |
| 89   | TAC Meeting #1 (2018-09-21)                                       | Meeting Summary  | Matthew Heberger | 10/05/18 | ✓        | Draft distributed to TAC via email on Oct 3, 2018.   |
| 90   | TAC Meeting #2 (2019-01-17)                                       | Agenda Package   | Matthew Heberger | 12/31/18 | ✓        | Meeting held on Jan 17, 2019. Agenda package sent on Jan 9.  |
| 91   | TAC Meeting #2 (2019-01-17)                                       | Meeting Summary  | Matthew Heberger | 01/15/19 | ✓        | Draft distributed to TAC via email on Jan 28, 2019   |
| 92   | TAC Meeting #3 (Spring 2019)                                      | Agenda Package   | Matthew Heberger | 02/28/19 | ●        |  |
| 93   | TAC Meeting #3 (Spring 2019)                                      | Meeting Summary  | Matthew Heberger | 03/15/19 | ●        |  |
| 94   | TAC Meeting #4 (Summer 2019)                                      | Agenda Package   | Matthew Heberger | 06/30/19 | ●        |  |
| 95   | TAC Meeting #4 (Summer 2019)                                      | Meeting Summary  | Matthew Heberger | 07/15/19 | ●        |  |
| 96   | TAC Teleconference (as necessary)                                 | Agenda Package   | Matthew Heberger | 06/30/19 | ✓        | An 3-hour teleconferences was held on June 29, 2018 to discuss Monitoring proposals for FY 2018-19, pesticides and CECs.                         |
| 97   | TAC Teleconference (as necessary)                                 | Meeting Summary  | Matthew Heberger | 06/30/19 | ✓        |  |

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| Task | Deliverable   | Assigned To  | Due Date          | Status   | Comments |   |
|------|---|--|-------------------|----------|----------|---|
| 98   | <input type="checkbox"/> C. Technical Subcommittees                     |  |                   |          |          |   |
| 99   | <input type="checkbox"/> Pesticides subcommittee meetings               |  |                   |          |          |   |
| 100  | Pesticides Subcommittee Meeting #1                                      | Meeting agenda package; meeting summary                                | Matthew Heberger  | 08/01/18 | ✓        |   |
| 101  | Pesticides Subcommittee Meeting #2                                      | Meeting agenda package; meeting summary                                | Matthew Heberger  | 08/28/18 | ✓        |   |
| 102  | Pesticides Subcommittee Meeting #3                                      | Meeting agenda package; meeting summary                                | Matthew Heberger  | 09/13/18 | ✓        |   |
| 103  | Pesticides Subcommittee Meeting #4                                      | Meeting agenda package; meeting summary                                | Matthew Heberger  | 12/31/18 | ✓        |   |
| 104  | Pesticides Subcommittee Meeting #5                                      | Meeting agenda package; meeting summary                                | Matthew Heberger  | 03/31/19 | ✓        |   |
| 105  | Pesticides Subcommittee Meeting #6                                      | Meeting agenda package; meeting summary                                | Matthew Heberger  | 06/30/19 | ✓        |   |
| 106  | <input type="checkbox"/> Nutrients subcommittee meetings                |  |                   |          |          |   |
| 107  | Nutrients Subcommittee Meeting #1                                       | Meeting agenda package; meeting summary                                | Philip Trowbridge | 09/30/18 | ✓        |   |
| 108  | Nutrients Subcommittee Meeting #2                                       | Meeting agenda package; meeting summary                                | Philip Trowbridge | 12/31/18 | ✓        |   |
| 109  | Nutrients Subcommittee Meeting #3                                       | Meeting agenda package; meeting summary                                | Philip Trowbridge | 03/31/19 | ✓        |   |
| 110  | Nutrients Subcommittee Meeting #4                                       | Meeting agenda package; meeting summary                                | Philip Trowbridge | 06/30/19 | ✓        |   |
| 111  | <input type="checkbox"/> Mercury subcommittee meetings                  |  |                   |          |          |   |
| 112  | Mercury Subcommittee Meeting #1   | Meeting agenda package; meeting summary                                | Jay Davis         | 10/31/18 | ✓        |   |
| 113  | Mercury Subcommittee Meeting #2   | Meeting agenda package; meeting summary                                | Jay Davis         | 03/31/19 | ●        |   |
| 114  | <input type="checkbox"/> CEC Subcommittee meetings                      |  |                   |          |          |   |
| 115  | CEC Subcommittee Meeting #1   | Meeting agenda package; meeting summary                                | Matthew Heberger  | 10/31/18 | ✓        |   |
| 116  | CEC Subcommittee Meeting #2   | Meeting agenda package; meeting summary                                | Matthew Heberger  | 03/31/19 | ✓        |   |
| 117  | <input type="checkbox"/> Toxicity work group meetings                   |  |                   |          |          |   |
| 118  | Toxicity Work Group Meeting #1  | Meeting agenda package; meeting summary                                | Matthew Heberger  | 09/13/18 | ✓        |   |
| 119  | Toxicity Work Group Meeting #2  | Meeting agenda package; meeting summary                                | Matthew Heberger  | 03/31/19 | ●        | Tox WG members invited to Feb 26 meeting of Pesticides Subcommittee.  |
| 120  | <input type="checkbox"/> 3. Quality Assurance                           |  |                   |          |          |   |
| 121  | A. QAPP Revision  | Draft revised QAPP to send to signatories                              | Don Yee           | 09/28/18 | ✓        | Revised QAPP required to kick off FY18/19 monitoring, adding new and revised elements for pesticides monitoring.  |
| 122  | A. QAPP Revision  | Spring 2019 QAPP Revisions to signatories                              | Don Yee           | 07/15/19 | ●        | Budgeted for a minor revision in the spring of 2019, following the approval of the FY19/20 workplan to account for any updated labs, protocols, etc.<br><br>Note that the creation of a separate QAPP to cover CEC monitoring is included under a separate budget line and is listed as a standalone deliverable. |
| 123  | <input type="checkbox"/> 4. Nutrients Special Studies                   |  |                   |          |          |   |
| 124  | <input type="checkbox"/> 4.B. Chlorophyll Sensor Intercalibration Study |  |                   |          |          |   |
| 125  | Chlorophyll Sensor Intercalibration Study                               | Assessment of Chlorophyll Sensor Methods In Use                        | Matthew Heberger  | 12/31/18 | ✓        | USGS will lead this task  |
| 126  | Chlorophyll Sensor Intercalibration Study                               | Presentation to WG on Field Intercalibration Exercises                 | Matthew Heberger  | 12/31/18 | ✓        |   |
| 127  | Chlorophyll Sensor Intercalibration Study                               | Report on Laboratory Intercalibration Study                            | Matthew Heberger  | 03/31/19 | ●        |   |
| 128  | Chlorophyll Sensor Intercalibration Study                               | Summary Report with Recommendations for Next Steps                     | Matthew Heberger  | 06/30/19 | ●        |   |
| 129  | Chlorophyll Sensor Intercalibration Study                               | Workgroup Meeting #1, Agenda and Summary                               | Matthew Heberger  | 09/30/18 | ✓        | WG Meeting #1 held Sept 28, 2018  |
| 130  | Chlorophyll Sensor Intercalibration Study                               | Workgroup Meeting #2, Agenda and Summary                               | Matthew Heberger  | 12/31/18 | ✓        | WG Meeting #2 held Dec 5, 2018  |
| 131  | Chlorophyll Sensor Intercalibration Study                               | Workgroup Meeting #3, Agenda and Summary                               | Matthew Heberger  | 03/31/19 | ●        | Meeting planned for March 2019  |
| 132  | Chlorophyll Sensor Intercalibration Study                               | Workgroup Meeting #4, Agenda and Summary                               | Matthew Heberger  | 06/30/19 | ●        |   |
| 133  | <input type="checkbox"/> 4.A. WY2016 Modeling and Monitoring Synthesis  |  |                   |          |          |   |
| 134  | WY2016 Modeling and Monitoring Synthesis                                | Progress Report to Nutrient Subcommittee or Delta-Suisun Modeling Team | Matthew Heberger  | 07/31/18 | ✓        | Provided progress report to RB5 to give to the STAG. Gave a presentation to the STAG on 9/18/18.  |
| 135  | WY2016 Modeling and Monitoring Synthesis                                | Progress Report to Nutrient Subcommittee or Delta-Suisun Modeling Team | Matthew Heberger  | 01/31/19 | ✓        | This update should be given at the Delta-Suisun Team Meeting  |
| 136  | WY2016 Modeling and Monitoring Synthesis                                | Progress Report to Nutrient Subcommittee or Delta-Suisun Modeling Team | Matthew Heberger  | 07/31/19 | ●        | This update should be given at the Delta-Suisun Team Meeting  |
| 137  | WY2016 Modeling and Monitoring Synthesis                                | Progress Report to Nutrient Subcommittee or Delta-Suisun Modeling Team | Matthew Heberger  | 01/31/20 | ●        | This update should be given at the Delta-Suisun Team Meeting  |

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| Task | Deliverable   | Assigned To   | Due Date         | Status   | Comments |   |
|------|---|---|------------------|----------|----------|---|
| 138  | WY2016 Modeling and Monitoring Synthesis              | Create WY2016 Hydrodynamics Model Output  | Matthew Heberger | 03/31/19 |          | WY2016 hydrodynamics will be developed in DFM by SFEI staff. The STAG/Nutrients Subcmte was briefed of this change on 9/18/18 and agreed.<br><br>Allie King, PhD, a new SFEI staff scientist, began working on this in Nov 2018.  |
| 139  | WY2016 Modeling and Monitoring Synthesis              | Develop Converter Code  | Matthew Heberger | 12/31/19 |          | Code will be developed during 2019. Code could not be developed in 2018 without delaying the project. The STAG/Nutrients Subcmte was briefed of this change on 9/18/18 and agreed.  |
| 140  | WY2016 Modeling and Monitoring Synthesis              | Draft Report for Delta RMP Committee Review   | Matthew Heberger | 03/31/20 |          |   |
| 141  | WY2016 Modeling and Monitoring Synthesis              | Final Report  | Matthew Heberger | 06/30/20 |          |   |
| 142  | 5. Mercury Monitoring FY18/19                         |   |                  |          |          |   |
| 143  | 5.A. Mercury Data collection and analysis             | Year 3 Mercury Data Report  | Jay Davis        | 12/31/19 |          |   |
| 144  | 5.B. Mercury Data Management and Quality Assurance    | Mercury Fish and Water QA Summary Technical Memo  | Don Yee          | 10/31/19 |          |   |
| 145  | 5.B. Mercury Data Management and Quality Assurance    | Formatted and QA'ed Mercury Data uploaded to CEDEN  | Amy Franz        | 10/31/19 |          |   |
| 146  | 6. Pesticide Monitoring Water Year 2019               |   |                  |          |          |   |
| 147  | 6.A. Field sample collection and laboratory analysis  | Amendments to QAPP describing sampling and analysis for pesticides chemistry and aquatic toxicity | Don Yee          | 09/30/18 |          |   |
| 148  | 6.A. Field sample collection and laboratory analysis  | Pesticides chemistry provisional data shared with TAC, Event #1                                   | Matthew Heberger | 12/31/18 |          | Updated 2/13/19: ASC has received from OCRL: (2) scanned field data sheets, and (3) Chain of Custody forms. Still expecting (1) Provisional results in a spreadsheet. Analysis of the samples was delayed because of the federal government shutdown.   |
| 149  | 6.A. Field sample collection and laboratory analysis  | Pesticides chemistry provisional data shared with TAC, Event #2                                   | Matthew Heberger | 02/28/19 |          | (1) Provisional results in a spreadsheet, (2) scanned field data sheets, and (3) Chain of Custody forms.  |
| 150  | 6.A. Field sample collection and laboratory analysis  | Pesticides chemistry provisional data shared with TAC, Event #3                                   | Matthew Heberger | 03/31/19 |          | (1) Provisional results in a spreadsheet, (2) scanned field data sheets, and (3) Chain of Custody forms.  |
| 151  | 6.A. Field sample collection and laboratory analysis  | Pesticides chemistry provisional data shared with TAC, Event #4                                   | Matthew Heberger | 05/31/19 |          | (1) Provisional results in a spreadsheet, (2) scanned field data sheets, and (3) Chain of Custody forms.  |
| 152  | 6.A. Field sample collection and laboratory analysis  | Pesticides chemistry provisional data shared with TAC, Event #5                                   | Matthew Heberger | 06/30/19 |          | (1) Provisional results in a spreadsheet, (2) scanned field data sheets, and (3) Chain of Custody forms.  |
| 153  | 6.A. Field sample collection and laboratory analysis  | Pesticides chemistry provisional data shared with TAC, Event #6                                   | Matthew Heberger | 07/31/19 |          | (1) Provisional results in a spreadsheet, (2) scanned field data sheets, and (3) Chain of Custody forms.  |
| 154  | 6.A. Field sample collection and laboratory analysis  | Pesticides Chemistry Lab Report   | Jim Orlando      | 12/31/19 |          | Report to the Delta RMP; not a formal USGS Data Series Report.  |
| 155  | 6.B. Toxicity reporting                               | Toxicity Lab Reporting, Sampling Event #1   | Marie Stillway   | 12/31/19 |          | ASC has contracted with AHPL to produce this reporting, as it is NOT covered under the contract with SWAMP. In lieu of a formal report, the lab manager will provide provisional data and information on the labs internal processes and controls, including: A) SWAMP Toxicity Transformers (no charge); B) Bench Sheet Copies; C) Reference Toxicant Control Charts; D) Corrective Actions Table. |
| 156  | 6.B. Toxicity reporting                               | Toxicity Lab Reporting, Sampling Event #2   | Marie Stillway   | 02/28/19 |          | Due dates are approximate, as sampling will be coordinated with storms and runoff conditions, not set in advance.   |
| 157  | 6.B. Toxicity reporting                               | Toxicity Lab Reporting, Sampling Event #3   | Marie Stillway   | 03/31/19 |          |   |
| 158  | 6.B. Toxicity reporting                               | Toxicity Lab Reporting, Sampling Event #4   | Marie Stillway   | 05/31/19 |          |   |
| 159  | 6.B. Toxicity reporting                               | Toxicity Lab Reporting, Sampling Event #5   | Marie Stillway   | 06/30/19 |          |   |
| 160  | 6.B. Toxicity reporting                               | Toxicity Lab Reporting, Sampling Event #6   | Marie Stillway   | 07/31/19 |          |   |
| 161  | 6.C. Pesticides Data Management and Quality Assurance | Pesticides chemistry QA Summary and Technical Memo  | Don Yee          | 12/31/19 |          |   |
| 162  | 6.C. Pesticides Data Management and Quality Assurance | Formatted pesticides data uploaded to CEDEN   | Amy Franz        | 12/31/19 |          |   |
| 163  | 7. CEC Monitoring Plan FY18/19                        |   |                  |          |          |   |
| 164  | 7.A. CEC Monitoring Coordination and planning         | Draft CEC Sampling and Analysis Plan  | Matthew Heberger | 03/04/19 |          |   |
| 165  | 7.A. CEC Monitoring Coordination and planning         | Final CEC Sampling and Analysis Plan  | Matthew Heberger | 04/30/19 |          |   |
| 166  | 7.B. QAPP Amendments to cover CEC Monitoring          | Draft QAPP for CEC monitoring   | Matthew Heberger | 03/25/19 |          |   |
| 167  | 7.B. QAPP Amendments to cover CEC Monitoring          | Final QAPP for CEC monitoring   | Matthew Heberger | 04/30/19 |          |   |

# 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.

| Task   | Date Created | Due Date | Assigned To          | Status | Comments   |
|--|--------------|----------|----------------------|--------|--|
| 1 <input type="checkbox"/> Steering Committee (SC) Action Items  |              |          |                      |        |  |
| 2 <input type="checkbox"/> SC Action Items 2/5/2018  | 02/05/18     |          |                      |        |  |
| 3 Circulate the revised RFP document to SC members and asked them to share it widely with their professional networks.   | 02/05/18     | 02/28/18 | Matthew Heberger     | ✓      |  |
| 4 <input type="checkbox"/> SC Action Items 3/2/2018  | 03/02/18     |          |                      |        |  |
| 5 Finalize the October 24, 2017 Joint Meeting Summary and post to the website.   | 03/02/18     | 03/31/18 | Matthew Heberger     | ✓      |  |
| 6 Schedule additional 1 to 1.5 hr. Steering Committee conference call as needed to cover agenda items that we did not have time to cover at the March SC meeting   | 03/02/18     | 04/30/18 | Matthew Heberger     | ✓      |  |
| 7 Form a data management subcommittee  | 03/02/18     | 04/30/18 | Matthew Heberger     | ✓      |  |
| 8 Adam Laputz, Greg Gearheart, Sam Safi, and Debbie Webster will meet and compile feedback from committee members on the draft Delta Science Plan and forward to Yumiko Henneberry.  | 03/02/18     | 04/30/18 | Adam Laputz          | ✓      |  |
| 9 Update the Monitoring Design to include recommended changes to the Nutrients Assessment Questions approved by the Steering Committee   | 03/02/18     | 05/30/18 | Matthew Heberger     | ✓      |  |
| 10 The SC requested that ASC and the Finance Subcommittee begin considering options for the upcoming fiscal year's work plan that are in line with possible funding scenarios  | 03/02/18     | 04/30/18 | Matthew Heberger     | ✓      | This is a regular part of our revenue forecasting and budgeting process.   |
| 11 The Finance Subcommittee was asked to develop some "out of the box" options for addressing the need to maintain purchasing power but the unwillingness of participants to vote for a fee increase at their next meeting     | 03/02/18     | 05/31/18 | Finance Subcommittee | ✓      | Discussed the week of April 23, 2018.  |
| 12 Schedule a conference call for committee discussion of the fee increase issue   | 03/02/18     | 04/30/18 | Matthew Heberger     | ✓      | To discuss during the next regularly scheduled Finance Subcommittee meeting.   |
| 13 RMP should look into whether SCCWRP model is feasible for the Delta RMP contracting process (e.g., requiring labs to conduct inter-laboratory comparison testing so that they can participate in sampling for the program). | 03/02/18     | 06/01/18 | Adam Laputz          | ✓      | Discussed at a meeting of the Toxicity Work Group on May 14, 2018. We concluded it is not feasible because (a) SCWRPP awards millions in contracts which gives them leverage that we do not have (b) at present we are locked into a single-source contract.   |
| 14 <input type="checkbox"/> SC Action Items 5/11/2018  | 05/11/18     |          |                      |        |  |
| 15 Finalize the February 5, 2018 & March 2, 2018 Meeting Summaries and post to the website.  | 05/11/18     | 05/30/18 | Matthew Heberger     | ✓      |  |
| 16 Circulate a Doodle Poll to select a date for the Fall Joint SC/TAC Meeting. (Matt Heberger)   | 05/11/18     | 05/30/18 | Matthew Heberger     | ✓      | Meeting scheduled for Oct 29, 2018 at the Cal/EPA building.  |
| 17 Distribute login information for the TAC web site to the committee. Utilize a push notification for updates going forward.  | 05/11/18     | 05/30/18 | Matthew Heberger     | ✓      | Detailed instructions sent on May 17 to TAC and SC members, subject line "How to Access Delta RMP Data." I have also put most of this information on a new page on our TAC workspace website for easy reference. Visit <a href="https://sites.google.com/a/sfei.org/delta-rmp/">https://sites.google.com/a/sfei.org/delta-rmp/</a> and click "Data Access."  |
| 18 Technical Committee should discuss co-chair/chair needs and bring recommendation to the next Steering Committee meeting   | 05/11/18     | 07/17/18 | Stephen McCord       | ✓      | Discussed by the TAC at its June 12 meeting. See meeting summary for details.  |
| 19 Consider submitting a Prop 1 funding for the CEC Study and Pesticides Monitoring. This item should be added to the next TAC meeting agenda.   | 05/11/18     | 06/04/18 | Matthew Heberger     | ✓      | We looked into the possibility and did not see it as a good fit. One challenge is that the program does not have in place an approved pesticides monitoring design which could be expanded through grant funding. Another challenge is that this grant program is for "studies" and not ongoing monitoring, and there needs to be a strong link to wildlife. |
| 20 Put in place subcontract with Deltares (for the Pesticides Interpretive Report)   | 05/11/18     | 06/15/18 | Matthew Heberger     | ✓      |  |
| 21 Finance Subcommittee will discuss the options/framework for an overall funding process and how to make the process more efficient and bring a proposal to the next Steering Committee meeting.                              | 05/11/18     | 06/30/18 | Dalia Fadl           | ✓      | The finance committee held a meeting to discuss financing options on June 19.  |
| 22 Technical Advisory Committee will develop a strategic plan for utilizing the Science Advisors   | 05/11/18     | 06/30/18 | TAC members          | ✓      |  |
| 23 <input type="checkbox"/> SC Action Items 7/17/2018  | 07/17/18     |          |                      |        |  |

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| Task | Date Created   | Due Date | Assigned To | Status                      | Comments |  |
|------|--|----------|-------------|-----------------------------|----------|--|
| 24   | Verify that the budget in the workplan is correct, and reflects the 50% funding approved for the chlorophyll-a sensor intercalibration study.  | 07/17/18 | 07/27/18    | Matthew Heberger            | ✓        | It was correct.  |
| 25   | Put Multi-Year Planning on the agenda for the Fall Joint Meeting.  | 07/17/18 | 09/28/18    | Matthew Heberger            | ✓        |  |
| 26   | As we are planning the pesticides study, make sure we take into consideration the ILRP monitoring that is occurring at Ulatis Creek, to make sure that we are not duplicating efforts.   | 07/17/18 | 09/28/18    | Matthew Heberger            | ✓        |  |
| 27   | Send suggested edits of the mercury data report to ASC.  | 07/17/18 | 07/27/18    | Steering Committee          | ✓        |  |
| 28   | At the next SC meeting, the data management subcommittee should give a report on its findings and recommendations. This update should include updated recommendations on last year's planned Data Assessment Framework Workshop.   | 07/17/18 | 09/28/18    | Matthew Heberger            | ✓        | I have included this on the agenda for the meeting, and the co-leaders of this subcommittee are preparing a report.  |
| 29   | <input type="checkbox"/> SC Action Items 10/29/2018  |          |             |                             |          |  |
| 30   | Create charter language guidelines for the creation and assignment of Steering Committee seats.  | 10/29/18 | 01/15/19    | Patrick Morris              | ✓        | Volunteers include Rebecca Franklin, Stephanie Hiestand, Patrick Morris, Dan Reardon, Greg Gearhart. The group has met once and will have a followup meeting in Jan 2019.  |
| 31   | Update charter following the revisions approved by the SC.   | 10/29/18 | 12/31/18    | Matthew Heberger            | ✓        |  |
| 32   | Distribute Draft QAPP to TAC for "red flag" review.  | 10/29/18 | 10/31/18    | Matthew Heberger            | ✓        |  |
| 33   | Adam Laputz will draft a memo with instructions and timeline for the TAC regarding how the program plans to resolve lack of consensus over toxicity testing methods. The memo will be reviewed by the coordinating committee, then distributed to the TAC.   | 10/29/18 | 11/15/18    | Adam Laputz, Patrick Morris | ✓        | These issues were (completely?) resolved at the Nov 9, 2018 Toxicity Work Group meeting.   |
| 34   | Stephen McCord will revise the Management Drivers table. Like items will be grouped in the table and an explanatory column will be added defining the relationship of the Delta RMP goals and projects with the individual drivers. Upon completion, the revised table will be reviewed by the Coordinating Committee. | 10/29/18 | 12/15/18    | Stephen McCord              | ✓        |  |
| 35   | Add a long-term planning workshop to the FY20/21 workplan and add the workshop to the summer 2019 meeting schedule.  | 10/29/18 | 04/15/19    | Matthew Heberger            | ●        |  |
| 36   | Develop a timeline for the overall long-term planning process, coordinating revision of the Drivers Table with the budget priorities developed by the subgroups and distribute to the SC/TAC members.  | 10/29/18 | 12/31/18    | Matthew Heberger            | ●        |  |
| 37   | Develop a cover sheet for future Delta RMP publications  | 10/29/18 | 12/31/18    | Matthew Heberger            | ✓        |  |
| 38   | Add a list of recent publications to the SC meeting agenda   |          | 02/10/19    | Matthew Heberger            | ✓        |  |
| 39   | Conduct a Doodle Poll to schedule a conference call in December for committee input on the desired format and key messages for the Pulse of the Delta.   | 10/29/18 | 11/15/18    | Matthew Heberger            | ✓        |  |
| 40   |  |          |             |                             |          |  |
| 41   | <input type="checkbox"/> Technical Advisory Committee (TAC) Action Items   |          |             |                             |          |  |
| 42   | <input type="checkbox"/> TAC Action Items 3/15/2018  | 03/05/18 |             |                             |          |  |
| 43   | Set April 23, 2018 and September 21, 2018 meeting locations and announce to TAC  | 03/15/18 | 04/15/18    | Matthew Heberger            | ✓        |  |
| 44   | Revise the December 12, 2017 TAC Summary to clarify the edit which was made to the Current Use Pesticides Data Report.   | 03/15/18 | 04/15/18    | Matthew Heberger            | ✓        |  |
| 45   | Revise the decision grid survey as appropriate for ranking monitoring proposals and forward a link for completing the surveys to TAC members for each proposal to be rated.  | 03/15/18 | 03/21/18    | Matthew Heberger            | ✓        |  |
| 46   | Develop the modified versions of the proposed pesticides monitoring designs and have them ready for review by the Pesticides Subcommittee  | 03/15/18 | 03/21/18    | Matthew Heberger            | ✓        |  |
| 47   | Set the next Pesticide Subcommittee meeting date based on the Doodle Poll, closing March 16, 2018, and notify committee members of the meeting date.   | 03/15/18 | 03/21/18    | Matthew Heberger            | ✓        |  |
| 48   | Reconfirm their interest and availability of our science advisor nominees, and determine whether an honorarium can be paid to each; federal employees are typically not eligible to receive honoraria  | 03/15/18 | 04/30/18    | Matthew Heberger            | ✓        | Emails sent the first week of May, awaiting confirmation from some.  |
| 49   | Look into revising the Draft Mercury Data Report to use Liberty Island (instead of Prospect Slough) data for reporting conditions at Cache Slough.   | 03/15/18 | 04/30/18    | Jay Davis                   | ✓        | Changes to the report were made by the Principal Investigators, Jay Davis at SFEI and Wes Heim at the Moss Landing Marine Laboratory. The changes only affect the historic data shown in Figure 4 of the report. |
| 50   | <input type="checkbox"/> TAC Action Items 4/23/2018  | 04/23/18 |             |                             |          |  |
| 51   | Correct attendance roster for past TAC meeting to add Steve Louie.   | 04/23/18 | 04/30/18    | Matthew Heberger            | ✓        |  |
| 52   | Request our consulting statistician to pass on pertinent files to contractor for pesticides interpretive report.   | 04/23/18 | 04/30/18    | Matthew Heberger            | ✓        |  |
| 53   | Move recommendation for the contractor forward to the steering committee.  | 04/23/18 | 05/05/18    | Matthew Heberger            | ✓        |  |
| 54   | Add "n/a" as a response option on future decision grid questionnaire surveys   | 04/23/18 | 05/15/18    | Matthew Heberger            | ✓        |  |

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| Task  | Date Created | Due Date | Assigned To           | Status | Comments   |
|---|--------------|----------|-----------------------|--------|--|
| 55 Follow up with SFEI staff to find out if we are calculating mercury loading at Mallard Island.   | 04/23/18     | 04/30/18 | Matthew Heberger      | ✓      |  |
| 56 Add a cover sheet to the monitoring proposals which shows the rankings and summarizes the process (explains how the numbers were derived/what they mean)   | 04/23/18     | 05/05/18 | Matthew Heberger      | ✓      | Drafted a 5-page memo which describes this year's proposal development, selection, and ranking process. Includes passages from the Decision Grid materials developed last year by a stakeholder-led working group. |
| 57 Schedule a meeting for mercury subcommittee to develop a more detailed plan about when to sample high flows/storms etc.  | 04/23/18     | 05/30/18 | Jay Davis             | ✓      |  |
| 58 Provide additional detail on what a scaled down Mercury proposal might look like (if only spending 250k)   | 04/23/18     | 04/30/18 | Jay Davis             | ✓      |  |
| 59 Pesticides project planning, Evaluate the costs of running fathead minnow, rainbow trout, and Chironomus. And confirm with AHPL and USGS on feasibility of running tests on both test species and collecting the large volumes of sample water required.   | 04/23/18     | 05/15/18 |                       | ✓      | Have confirmed with Jim Orlando and Marie Stillway that it is NOT feasible to run both fish species at once. Physical limitations based on the water volumes required, bench space, refrigeration, power load.     |
| 60 Extend deadline for submission of comments on the AHPL Toxicity Report beyond May 10th.  | 04/23/18     | 04/30/18 |                       | ✓      |  |
| 61 Schedule a meeting of an ad hoc toxicity working group to discuss issue regarding the toxicity data interpretation (high variability, low EC samples). Work with Cam and Debra to figure out materials for meeting.  | 04/23/18     | 05/15/18 | Matthew Heberger      | ✓      |  |
| 62 Provide update on status of selection of science advisors at next TAC mtg.   | 04/23/18     | 06/01/18 | Matthew Heberger      | ✓      | Placed on agenda for June meeting  |
| 63 <input type="checkbox"/> TAC Action Items 06/12/2018   | 06/12/18     |          |                       |        |  |
| 64 Set a meeting of the Pesticides Subcommittee Meeting, Friday, November 9, 2018, 3-4 hours, to meet with the team from Deltares   | 06/12/18     | 06/30/18 | Matthew Heberger      | ✓      |  |
| 65 Set a "supplemental" meeting of the TAC for June 29, phone and online only. Purpose is to review and make a recommendation on the pesticides monitoring proposals.   | 06/12/18     | 06/15/18 | Matthew Heberger      | ✓      |  |
| 66 Draft a scope of work for toxicity reporting that describes a smaller effort to bring the total estimated costs closer to the 250k proposed budget.  | 06/12/18     | 06/15/18 | Matthew Heberger      | ✓      | ASC staff worked with AHPL lab manager to develop a quote for supplemental information provided to us at a cost of \$15K, rather than the \$50K report.  |
| 67 Revise the ranking questionnaire (for the pesticides monitoring design) with suggested edits and distribute to the TAC. The TAC will then have a week to complete the rankings.  | 06/12/18     | 06/30/18 | Matthew Heberger      | ✓      |  |
| 68 Follow up with swamp on flagging of Chironomus toxicity data, specifically what is the meaning and implication of being flagged as "survey data."  | 06/12/18     | 06/30/18 | Beverly Anderson-Abbs | ✓      |  |
| 69 Clarify what action/feedback is being requested from the steering committee at July 17, 2018 meeting on the CEC monitoring proposal.   | 06/12/18     | 06/30/18 | Brian Laurenson       | ✓      |  |
| 70 Include an agenda item in the July 17, 2018 steering committee meeting agenda to evaluate compensation for the TAC chair   | 06/12/18     | 06/30/18 | Matthew Heberger      | ✓      | Following discussion with the Coordinating Committee, it was agreed to handle this as part of the FY19/20 budgeting process.   |
| 71 For the memo "Plan for Science Advisor Input in FY18/19," add the names of the list of science advisors with the overall calendar of milestones/due dates. Add the following phrase at the end of the second sentence in the science advisor job description: "...to better support the goals of the Delta RMP." | 06/12/18     | 08/31/18 | Matthew Heberger      | ✓      |  |
| 72 <input type="checkbox"/> TAC Action Items 06/29/2018   | 06/29/18     |          |                       |        |  |
| 73 Find out how Chironomus toxicity data will be flagged in CEDEN and what implications that has for use by regulators  | 06/29/18     | 07/12/18 | Beverly Anderson-Abbs | ✓      |  |
| 74 Schedule meetings of the Pesticides Subcommittees and Toxicity Workgroup for July and August   | 06/29/18     | 07/12/18 | Matthew Heberger      | ✓      |  |
| 75 Send a track changes version to TAC members to show exactly what changed   | 06/29/18     | 07/01/18 | Matthew Heberger      | ✓      |  |
| 76 TAC members with any additional comments, especially any dissenting opinions should send any additional comments or feedback   | 06/29/18     | 07/01/18 | TAC members           | ✓      |  |
| 77 Stephen McCord to send his "talking points" about the proposal to TAC members for review   | 06/29/18     | 07/10/18 | Stephen McCord        | ✓      |  |
| 78 Distribute slide presentation about the pesticides monitoring proposal to TAC members  | 06/29/18     | 07/12/18 | Matthew Heberger      | ✓      |  |
| 79 <input type="checkbox"/> TAC Action Items 09/21/2018   | 09/21/18     |          |                       |        |  |
| 80 Schedule doodle poll for next pesticides subcommittee meeting  | 09/21/18     | 10/07/18 | Matthew Heberger      | ✓      |  |
| 81 Revise the June 29 tac summary; in the paragraph beginning "one tac member noted..." to replace the "would not" with "may not be useful."  | 09/21/18     | 09/30/18 | Matthew Heberger      | ✓      |  |
| 82 Revise pathogens monitoring final report with committee comments. Committee members to submit final comments no later than Tuesday, 9/25.  | 09/21/18     | 10/15/18 | Brian Lauerson        | ✓      |  |
| 83 Request TAC approval of the FY16/17 Pesticides data at the joint meeting agenda, prior to an SC vote on whether to approve and publish. (TAC members wanted more time to review the data.)   | 09/21/18     | 10/15/18 | Matthew Heberger      | ✓      |  |

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| Task | Date Created   | Due Date | Assigned To | Status           | Comments |  |
|------|--|----------|-------------|------------------|----------|--|
| 84   | Jim Orlando requested Matt send him a copy of the appendix to the QAPP.  | 09/21/18 | 10/15/18    | Matthew Heberger | ✓        |  |
| 85   | Invite one or more science advisors to the November 9, 2018 pesticides subcommittee (with Delatares). Also, schedule a one hour meeting with the science advisors (without Delatares) after the subcommittee meeting.  | 09/21/18 | 10/15/18    | Matthew Heberger | ✓        | This meeting has been postponed until Dec 10 and changed to a teleconference. Invited our two pesticides advisors, Drs. Nowell and Cherr.  |
| 86   | Include a specific science advisor engagement plan in next year's work plan.   | 09/21/18 | 04/15/19    | Matthew Heberger | ●        |  |
| 87   | Work with Cam Irvine to revise tox testing information in presentation.  | 09/21/18 | 10/15/18    | Matthew Heberger | ✓        | Recorded by Daphne. Emailed Cam to disambiguate. Neither of us could understand what it meant.   |
| 88   | Matt will develop a timeline for completion of the QAPP and distribution to the TAC for review and approval. This will be added to the agenda of the next pesticides subcommittee (date TBD).  | 09/21/18 | 10/05/18    | Matthew Heberger | ✓        |  |
| 89   | Matt will begin the process of securing funding and assistance for writing a CEC-related prop 1 proposal. CEC subcommittee could also assist ASC in writing and review of the proposal.  | 09/21/18 | 10/05/18    | Matthew Heberger | ✓        |  |
| 90   | Matt will look into securing a guest speaker for October 29th joint meeting.   | 09/21/18 | 10/15/18    | Matthew Heberger | ✓        |  |
| 91   | Incorporate the following suggested items from the committee into the joint meeting agenda (see meeting summary for list)  | 09/21/18 | 10/15/18    | Matthew Heberger | ✓        |  |
| 92   | Ask Dave Mount from EPA his expert opinion on the use of an alternative mid-range conductivity control for toxicity testing with Ceriodaphnia dubia  | 09/21/18 | 10/03/18    | Matthew Heberger | ✓        | Received an email from Debra Denton with Dr. Mount's comments on Oct 3.  |
| 93   | Propose that OIMA revise the memo on the use of low-conductivity controls for toxicity testing with Ceriodaphnia dubia.  | 09/21/18 | 10/03/18    | Matthew Heberger | ✓        | Informed by Melissa Morris via email on Oct 2 that they are considering revising their guidance documents, but the timeline is uncertain.  |
| 94   | <input type="checkbox"/> TAC Action Items 2019-01-07   |          |             |                  |          |  |
| 95   | Update project management plan (Gantt chart) with correct dates for the Pulse publication timeline (Fall 2020)   | 01/17/19 | 01/25/19    | Matthew Heberger | ✓        |  |
| 96   | Contact Janis Cooke regarding bivalve sampling program she is managing and potential for coordinating/cost-sharing   | 01/17/19 | 01/25/19    | Matthew Heberger | ✓        | Matt spoke to Janis on Jan 25. She is contracting with the Fisheries Foundation, a nonprofit fish biology firm in Elk Grove. Only one of their planned monthly sampling sites is in the same location as the planned Delta RMP sampling sites, however other sites on the Sacramento River are somewhat close to ours. They field crew is planning on 3 days to monitor all 10 of their sites. We had presumed it would take 2 days to monitor our 5 sites for bivalves and sediment. So it appears economies of scale are likely to be minor. However, we will consider obtaining a bid from this firm. |
| 97   | Update monitoring event summary worksheet to correct typo (Mercury sampling planned in 2019).  | 01/17/19 | 01/25/19    | Matthew Heberger | ✓        |  |
| 98   | Add an errata sheet to the toxicity lab reports, to indicate to readers that the C. dubia data has been modified after the report was written, and that data users should obtain updated data from CEDEN, and be aware that tables and summaries may be inaccurate.                    | 01/17/19 | 01/31/19    | Matthew Heberger | ●        |  |
| 99   | Update and reconfirm members of our TIE Committee  | 01/17/19 | 01/31/19    | Matthew Heberger | ✓        |  |
| 100  | Add Ted Swift (DWR) to the chlorophyll intercalibration workgroup  | 01/17/19 | 01/31/19    | Matthew Heberger | ✓        |  |
| 101  | Add "science strategies" to our table of management drivers  | 01/17/19 | 01/31/19    | Matthew Heberger | ✓        |  |
| 102  | Distribute announcement on pesticides symposium to TAC members   | 01/17/19 | 01/31/19    | Matthew Heberger | ✓        |  |
| 103  | This spring, review the management and assessment questions for each focus area with the relevant technical subcommittee.  | 01/17/19 | 01/31/19    | Matthew Heberger | ●        | Planned to discuss at Pesticides Subcommittee meeting on Feb 26, 2019.   |
| 104  | Schedule a pesticides subcommittee meeting for this spring in order to review the wet weather/high flow monitoring triggers and potentially lower them.  | 01/17/19 | 01/31/19    | Matthew Heberger | ✓        |  |
| 105  |  |          |             |                  |          |  |
| 106  | <input type="checkbox"/> Coordinating Committee Action Items   |          |             |                  |          |  |
| 107  | <input type="checkbox"/> Coordinating Committee Meeting on 4/11/2018   |          |             |                  |          |  |
| 108  | Adam to contact Metropolitan Water District of Southern California (Met), the State Water Contractors (SWC) or the Association of California Water Agencies (ACWA) to inquire about their interest in joining the Delta RMP. Also possibly Sacramento Source Water Protection Program. | 04/11/18 | 05/30/18    | Adam Laputz      | ✓        | Email reminder sent 7/2/2018. SWC has said no, Adam to contact others.   |
| 109  | Adam to contact the Delta Science Program (DSP) to see if they are interested in a seat on the Steering Committee. If they are interested, he should introduce an agenda item at a future SC meeting about creating additional seats on the SC to represent... Science? Research?      | 04/11/18 | 05/30/18    | Adam Laputz      | ✓        | Email reminder sent 7/2/2018. Adam has tried contacting Reiner.  |
| 110  | Adam to request Gita Kapahi to continue working with us as a facilitator for the TAC into next year. If she is not available, to investigate other alternatives.   | 04/11/18 | 05/30/18    | Adam Laputz      | ✓        |  |
| 111  | <input type="checkbox"/> Coordinating Committee Meeting on June 7, 2018  |          |             |                  |          |  |
| 112  | Debbie agreed to talk to her technical advisors about the issues with the toxicity lab to ensure that we are adequately dealing with concerns about past data and are able to move forward with seeking approval of a plan for the upcoming year.                                      | 06/07/18 | 06/28/18    | Debbie Webster   | ✓        |  |

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| Task | Date Created  | Due Date | Assigned To | Status           | Comments |   |
|------|---|----------|-------------|------------------|----------|---|
| 113  | Send pesticides monitoring proposals to our expert advisors   | 06/07/18 | 06/28/18    | Matthew Heberger | ✓        |   |
| 114  | Confirm whether Melissa Turner is still willing and able to give a presentation about ILRP monitoring   | 06/07/18 | 06/28/18    | Matthew Heberger | ✓        |   |
| 115  | Add information on population to Matt's spreadsheet of Delta RMP contributors and their amounts.  | 06/07/18 | 06/28/18    | Selina Cole      | ✓        |   |
| 116  | Consider organizing special meeting of SC delegates to discuss pesticides proposals between June 25 and July 3  | 06/07/18 | 06/28/18    | Debbie Webster   | ✓        |   |
| 117  | Call the Army Corps today and remind them that they need to make their \$50K contribution promptly. They are under an MOU to pay within 15 days.  | 06/07/18 | 06/07/18    | Matthew Heberger | ✓        |   |
| 118  |  Coordinating Committee Meeting on Oct 6, 2018   | 10/06/18 |             |                  |          |   |
| 119  | Propose a deadline on our Data Management and Quality Assurance SOP, check with Melissa Morris that it's acceptable.  | 10/06/18 | 10/15/18    | Matthew Heberger | ✓        | Ms. Morris confirmed that "Yes, if the updates meet the requirements of a QAPP for the new sections, we can keep the conditional approval going as long as needed to complete the SOP. "  |
| 120  | Provide an update on the Data Management and Quality Assurance SOP document to the Steering Committee.  | 10/06/18 | 10/29/18    | Matthew Heberger | ✓        | Update scheduled for Joint Meeting on 10/29.  |
| 121  | Patrick to write a 1-2 page memo explaining why DWR is in the program; their participation is required in 3 different permits covering barriers, eco-restore, etc. Include in this memo the current participant categories, e.g. stormwater, wastewater, regulatory-state, etc.                           | 10/06/18 | 10/15/18    | Patrick Morris   | ✓        |   |
| 122  | Send a note to the Steering Committee: Ask members whether they have any changes to the Charter?  | 10/06/18 | 10/08/18    | Matthew Heberger | ✓        |   |
| 123  | Consider a change to the Charter so that the TAC does not require co-chairs.  | 10/06/18 | 10/15/18    | Matthew Heberger | ✓        | Agendized for 10/29 meeting.  |
| 124  | Consider allowing alternates for the Steering Committee chairs.   | 10/06/18 | 10/15/18    | Matthew Heberger | ✓        | Agendized for 10/29 meeting.  |
| 125  | Invite Mike Wackman and Stephen McCord to future Coordinating Committee Meetings.   | 10/06/18 | 10/29/18    | Matthew Heberger | ✓        |   |
| 126  | Send calendar invitations for planned meetings  | 10/06/18 | 10/15/18    | Matthew Heberger | ✓        |   |
| 127  |   |          |             |                  |          |   |
| 128  |  Informal Action Items   |          |             |                  |          |   |
| 129  | Add to the next finance memo: "bank account" style statement that shows at a glance how much money we have, how much we are expecting, and how much in savings.   |          | 04/15/18    | Matthew Heberger | ✓        | Added to the 2018 Q1 Finance Memo. Requesting feedback on the format.   |
| 130  | Send twice yearly roster updates to RB5 staff to update on the website. This is an appendix to the Charter  | 05/15/18 | 07/31/18    | Matthew Heberger | ✓        | Request by Selina Cole  |
| 131  | Send twice yearly roster updates to RB5 staff to update on the website. This is an appendix to the Charter  | 05/15/18 | 12/31/18    | Matthew Heberger | ✓        | Sent 2018-10-29   |
| 132  | Send twice yearly roster updates to RB5 staff to update on the website. This is an appendix to the Charter  | 05/15/18 | 07/31/19    | Matthew Heberger | ●        |   |
| 133  | Send twice yearly roster updates to RB5 staff to update on the website. This is an appendix to the Charter  | 05/15/18 | 12/31/19    | Matthew Heberger | ●        |   |
| 134  | Consider updates to 2 sections of the charter. How data is managed and when it is released, and Conflict of Interest.   | 06/18/18 | 10/01/18    | Matthew Heberger | ✓        | Request by Greg Gearheart. We have not received a specific proposal for what changes to make. Current understanding is that the Data Management Subcommittee is looking into these issues and will make recommendations.  |
| 135  | Ask subcommittees whether there are projects or reports that would benefit from feedback from our science advisors  | 07/19/18 | 08/31/18    | Matthew Heberger | ✓        | Placed on the agenda for the Pesticides Subcommittee  |
| 136  | Respond in writing to Melissa Turner's comments on the FY16/17 Pesticides data and QA memo  | 08/13/18 | 08/31/18    | Don Yee          | ✓        |   |
| 137  | Create a poster for the Bay Delta Science Conference and present it to the SC for approval at their July 2018 meeting   | 05/07/18 | 07/07/18    | Matthew Heberger | ✓        | Notification sent via email as it was not ready in time for the SC meeting in July. Poster presented at BDSC, Sept 10 -12.  |
| 138  | Put in place a contract between ASC and Caltrans so that they can contribute financially to the Delta RMP and fulfill their requirements to conduct Delta Mercury Control Program (Delta Mercury TMDL) monitoring and other monitoring in the Delta. Approval letter from RB5 dated 2018-05-16 (on file). | 05/16/18 | 10/15/18    | Patrick Walsh    | ●        | ASC staff have been working with Patrick Morris at the Regional Bard and Tom Rutsch at Caltrans since May 2019 to negotiate a contract. Patrick Walsh, ASC's Director of Finance & Contracts, sent the most recent version to Caltrans on 2018-09-20. Matt phoned Tom on 2018-10-02 to inquire on the status, and Tom promised to reply by the week of Oct 8. Update Oct 22: Tom Rutsch wrote: "Sorry this is taking so long. We are still reviewing/processing it. I can update you in mid November." Update Nov 16: "Contract is with our Contracts division and they estimate that based on their workload it will still be 1 to 2 months."<br><br>Update 2/13/19: ASC received contract and signed. Awaiting final signature from Caltrans. |

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| Task  | Date Created | Due Date | Assigned To   | Status | Comments  |
|---|--------------|----------|---|--------|---|
| 139 Adam to speak to Tom Mumley regarding Contra Costa County's contribution to the Delta RMP. The County has a Phase 1 MS4 permit for its unincorporated areas. It straddles both Region 2 (Bay) and Region 5 (Central Valley), however the majority of the population is in the Bay. In 2015, there was discussion of asking them to contribute to the Delta RMP. RB5 staff and leadership would like for the County to begin paying their fair share to the Delta RMP. | 07/20/18     | 08/31/18 | Adam Laputz   | ✓      | Adam informed Matt in Sept 2018 that this conversation took place. Central Valley Board staff should follow up with Contra Costa County if their stormwater discharge permit will be modified to require their participation in the Delta RMP.  |
| 140 Send twice yearly roster updates to RB5 staff to update on the website. This is an appendix to the Charter.   | 05/01/18     | 01/31/19 | Matthew Heberger  | ●      |   |
| 141 Consider an amendment to the Communication Plan (or next year's workplan?) that says we plan for 2 rounds of review for most reports. Any more than this would be considered an exception and would need certain approvals (?), timeline extension, and budget increase.  | 10/23/18     | 06/30/19 | Delta RMP SC  | ●      | See file Google Drive\Delta RMP\Delta RMP Documents\Foundational Documents\Communication Plan\Communications Plan Potential Update 2018-10-23.txt   |
| 142 Consider drafting a State Board resolution on guiding principles and minimum expectations for regional monitoring programs.   | 11/15/18     | 03/31/19 | Greg Gearheart  | ●      | From a meeting with Greg on Nov 15. He proposed this to help clarify common issues and pitfalls that crop up with collaborative monitoring projects around the state. The state allows dischargers to participate in these programs, and they are a form or regulatory relief. In return, there should be a set of minimum standards around quality assurance, timeliness of reporting, etc.  |
| 143 SFEI staff will meet with Melissa Morris for training/ discussion around SWAMP expectations for Quality Assurance Program Plans (QAPPs), Data Quality Assessment, and other Data Management and Quality Assurance issues.   | 11/15/18     | 02/28/19 | Matthew Heberger  | ✓      | Training held on Jan 7, 2019.   |
| 144 Update the Data Management and Quality Assurance SOP document, with a specific focus on how mercury data is managed.  | 11/15/18     | 03/31/19 | Amy Franz   | ●      | Unfunded task. Planning to include funding request into next fiscal year's workplan.  |
| 145 Write a memo on how stakeholders ought to communicate with labs through the contract manager, rather than calling or emailing them directly with questions, which it is felt is inefficient and inappropriate. (Melissa is the contract manager for toxicity testing at the Aquatic Health Program Laboratory at UC Davis (AHPL), and Matt is the contract manager for pesticides chemistry at USGS Organic Chemistry Research Laboratory (OCRL).                     | 11/15/18     | 12/31/18 | Matthew Heberger  | ✓      | To include in the agenda package for the next TAC meeting and/or SC meeting.  |
| 146 Invite the group of regulators and staff (State Board, Regional Board, and SFEI staff) to have a meeting 2-4 times per year to "caucus" as necessary in advance of Steering Committee meetings.   | 11/15/18     | 02/15/19 | Matthew Heberger  | ●      | Matt to send Doodle poll.   |
| 147 Consider putting in place policies around how long stakeholders have to review drafts, how many opportunities they will be given to review  | 11/15/18     | 03/31/19 | Matthew Heberger  | ✓      | Proposal: plan for 2 review periods for most documents, especially important ones. A single review period should suffice for things such as meeting summaries, memos, etc. There will be a draft > comments > final draft > comments > final. After each of the 2 rounds of review, a response to comments will be issued, compiling the major comments and suggested edits into one document, and with a brief explanation of how the authors responded to the comment. This document will exclude minor comments, comments about formatting, grammar, spelling, style, etc. |
| 148 Consider formalizing "Rules of Order" for meetings, as it is felt we would benefit from having more structure and formalized decision making  | 11/15/18     | 03/31/19 | Matthew Heberger  | ●      | To discuss at the next meeting of the ad hoc committee on governance.   |
| 149 Send Matt suggestions or proposed revisions to the Charter related to SC decision-making and governance, particularly as it relates to the creation of new seats on the Steering Committee.   | 12/19/18     | 01/15/19 | Dan Riordan, Dave Tamayo, Debbie Webster, Greg Gearheart, Patrick Morris, | ✓      | As a result of an ad hoc subcommittee on governance, charged with examining how votes are allocated and how new SC seats are created. To be discussed at a follow-up meeting on Jan 31.   |
| 150   |              |          |   |        |   |
| 151   |              |          |   |        |   |
| 152 <input type="checkbox"/> Pesticides Subcommittee Action Items   |              |          |   |        |   |
| 153 <input type="checkbox"/> Pesticides Subcommittee Meeting on 4/18/2018   |              |          |   |        |   |
| 154 Matt to work with Jim Orlando on budget and logistics for field sampling (by May 15).   | 04/18/18     | 05/15/18 | Matthew Heberger  | ✓      |   |
| 155 Matt to work with GIS specialists and statistician Aroon on developing the appropriate sample frame and then doing the GRTS draw (by May 7).  | 04/18/18     | 05/07/18 | Matthew Heberger  | ✓      |   |
| 156 ASC staff to finalize proposals (including costs). Matt to send draft proposals to the subcommittee (by May 18).  | 04/18/18     | 05/18/18 | Matthew Heberger  | ✓      |   |
| 157 Subcommittee members to send feedback to be sent via email unless something critical comes up and a member suggests a meeting is necessary (by May 25)  | 04/18/18     | 05/25/18 | Pesticides Subcommittee   | ✓      |   |
| 158 Revised proposal to be included in TAC agenda package for June 12 meeting (by June 4).  | 04/18/18     | 06/04/18 | Matthew Heberger  | ✓      |   |
| 159 TAC members to fill in the decision grid ranking questionnaires for the 2 proposals during the week before and after the TAC meeting. Matt will compile the results of the ranking and distribute to the TAC. An additional short followup phone meeting will be scheduled if necessary and requested by TAC members.   | 04/18/18     | 06/04/18 | TAC members   | ✓      |   |
| 160 Matt to schedule another subcommittee meeting for June to discuss issues related to the sampling program, toxicity testing with Ceriodaphnia, and any other items of interest. (by May 20)  | 04/18/18     | 05/20/18 | Matthew Heberger  | ✓      | Since most of the issues in play were related to toxicity, and fairly technical, we convened a meeting of an ad hoc toxicity working group. This group met on .   |
| 161 <input type="checkbox"/> Pesticides Subcommittee Meeting on 8/1/2018  | 08/01/18     |          |   |        |   |

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| Task | Date Created  | Due Date | Assigned To | Status           | Comments |  |
|------|---|----------|-------------|------------------|----------|--|
| 162  | Share Deltares contract with the Pesticides Subcommittee (so they can see timeline and deliverables)  | 08/01/18 | 08/03/18    | Matthew Heberger | ✓        |  |
| 163  | Consider putting a discussion of human health impacts of contaminants on the agenda for the Fall Joint Meeting  | 08/01/18 | 10/01/18    | Matthew Heberger | ✓        | This recommendation came out of a discussion at the Pesticides Subcommittee where we were reacting to a newspaper article on the use of glyphosate in the Delta. The TAC was decidedly less enthusiastic about this idea when we discussed it on 9/21. |
| 164  | Plan a presentation about GRTS for the next meeting of the Pesticides Subcommittee on 8/28.   | 08/01/18 | 08/22/18    | Aroon Melwani    | ✓        |  |
| 165  | Research the issue of GRTS sample draw along polylines vs. in polygons, perform a brief literature review, speak to experts and advisors, and come back to the group with options at our next meeting   | 08/01/18 | 08/15/18    | Matthew Heberger | ✓        |  |
| 166  | Share DPR's criteria for storm sampling with the group.   | 08/01/18 | 08/15/18    | Cam Irvine       | ✓        |  |
| 167  | Add Alisha Wenzel to the list of people to be informed regarding TIEs.  | 08/01/18 | 08/15/18    | Patrick Morris   | ✓        |  |
| 168  | A subset of subcommittee members agreed to help draft relevant sections of the QAPP related to toxicity   | 08/01/18 | 08/21/18    | Cam Irvine       | ✓        |  |
| 169  | <input type="checkbox"/> Pesticides Subcommittee Meeting on 8/28/2018   |          |             |                  |          |  |
| 170  | Create a series of maps for the subcommittee, showing channels classified by depth, e.g. 2m, 3m, 4m   | 08/28/18 | 09/05/18    | Matthew Heberger | ✓        |  |
| 171  | Create 2-3 different "GRTS draws" demonstrating the effect of unequal probabilities   | 08/28/18 | 09/05/18    | Aroon Melwani    | ✓        |  |
| 172  | Run queries against the DPR PUR database on common almond pesticides, to determine when they are applied in the Delta   | 08/28/18 | 09/08/18    | Scott Wagner     | ✓        |  |
| 173  | Ask SFEI QA officer about whether he would support forgoing field dupes for toxicity testing  | 08/28/18 | 09/08/18    | Matthew Heberger | ✓        |  |
| 174  | Clarify whether SWAMP will pay for field duplicates for water toxicity tests through its contract with AHPL, or whether funding for field dupes would have to come out of Delta RMP funds.  | 08/28/18 | 09/08/18    | Matthew Heberger | ✓        | Rate of field duplicates of 5%. Only results in 3 additional env. samples per year, not a large additional expense.  |
| 175  | <input type="checkbox"/> Pesticides Subcommittee Meeting on 9/13/2018   |          |             |                  |          |  |
| 176  | Revise the analyte list in the Quality Assurance Program Plan (QAPP) based on new information from Jim Orlando  | 09/13/18 | 09/25/18    | Matthew Heberger | ✓        |  |
| 177  | send committee members Google Earth (KML) files of the sample frame (waterways classified as deep/shallow), and the points generated by GRTS, so that each member can review in "high def" by zooming in.   | 09/13/18 | 09/18/18    | Matthew Heberger | ✓        |  |
| 178  | Include a brief writeup in our sampling plan explaining why we chose the 2.5 m depth cutoff (balance between deep/shallow, ecological significance, looked right based on members knowledge of the Delta).  | 09/13/18 | 09/28/18    | Matthew Heberger | ✓        |  |
| 179  | Toxicity Work Group Meeting on 9/13/2018  |          |             |                  |          |  |
| 180  | Marie to double check whether her lab can report biomass as an additional endpoint without incurring additional expense or running afoul of their contract with SWAMP.  | 09/13/18 | 10/01/18    | Marie Stillway   | ✓        | Marie confirmed that her lab can report biomass at no additional expense.  |
| 181  | Share working draft of the QAPP with subcommittee members   | 09/13/18 | 09/15/18    | Matthew Heberger | ✓        |  |
| 182  | Send a reminder of how to access files on the Technical Advisory Committee (TAC) workspace website.   | 09/13/18 | 09/30/18    | Matthew Heberger | ✓        | Detailed instructions for how to access Delta RMP data are here: <a href="https://sites.google.com/a/sfei.org/delta-rmp/data-access">https://sites.google.com/a/sfei.org/delta-rmp/data-access</a>   |
| 183  | AHPL to send revised data to SWAMP where C. dubia tests were terminated at the wrong time.  | 09/13/18 | 10/15/18    | Marie Stillway   | ✓        | Marie confirmed that she sent revised results to Brian Ogg at the State Water Board in the last week of Sept 2018.   |
| 184  | Get Melissa Morris' input on the mid-range EC control issue.  | 09/13/18 | 10/01/18    | Matthew Heberger | ✓        |  |
| 185  | Send the final sample frame shapefile to Joe D. and Jim O.  | 09/20/18 | 10/01/18    | Matthew Heberger | ✓        |  |
| 186  | <input type="checkbox"/> Pesticides Subcommittee Meeting on 9/25/2018   | 09/25/18 |             |                  |          |  |
| 187  | Regarding Deltares' literature search and "gray literature," be sure that it includes recent monitoring overviews, especially those by Delta RMP members Joe Domagalski and Debra Denton.   | 09/25/18 | 11/09/18    | Erwin Roex       | ✓        | Sent these documents to Erwin Roex, PI.  |
| 188  | Look into adding data from California Integrated Water Quality System (CIWQS, commonly pronounced "sea-wicks"), especially any ambient or receiving water samples. (This came with a reminder that we are analyzing water quality conditions in the Delta, not estimating loadings or investigating pollutant sources). | 09/25/18 | 11/09/18    | Erwin Roex       | ✓        | Erwin Roex has corresponded about this with Debra Denton and Joe Domagalski.   |
| 189  | Include the "Legal Delta" boundary on future maps. Matt to send the "legal Delta boundary" shape file to Erwin.   | 09/25/18 | 09/30/18    | Matthew Heberger | ✓        |  |

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| Task | Date Created   | Due Date | Assigned To | Status           | Comments |  |
|------|--|----------|-------------|------------------|----------|--|
| 190  | Erwin to contact Xuyang Zhang at DPR to resolve discrepancies in the SURF database. The SURF database may include information that are not included elsewhere and should be included. Xuyang will help resolve questions, e.g. clarify what fraction the results represent (suspended sediment, dissolved, or total)   | 09/25/18 | 10/15/18    | Erwin Roex       | ✓        |  |
| 191  | Matt to look into the data that was recently added to the Regional Data Center (and CEDEN) by SFEI, check whether there is data that should be included for this study, and verify that it is included in the Deltares database.   | 09/25/18 | 09/30/18    | Matthew Heberger | ✓        | Here is an article about the project where SFEI digitized and uploaded dozens of "legacy" datasets to the Regional Data Center and CEDEN. Since these data are all in CEDEN, they were included in the download by Deltares scientists.<br><a href="https://www.sfei.org/news/completed-deduce-delta-environmental-data-understanding-california-estuary#sthash.CHfgJwe8.dpbs">https://www.sfei.org/news/completed-deduce-delta-environmental-data-understanding-california-estuary#sthash.CHfgJwe8.dpbs</a> |
| 192  | Xuyang Zhang agreed to provide to Deltares a list of pesticides registered for use in California from 2011 to present.   | 09/25/18 | 10/07/18    | Xuyang Zhang     | ✓        | Emailed on Oct 5.  |
| 193  | Deltares hand selected compounds to remove from their database to exclude non-pesticides (pharmaceuticals, industrial chemicals) based on their expert judgment. Erwin agreed to share list of excluded parameters to confirm none are pesticides.   | 09/25/18 | 10/15/18    | Erwin Roex       | ✓        |  |
| 194  | Danny McClure agreed to send (via Matt at ASC) additional information about pyrethroids bioavailability.   | 09/25/18 | 10/07/18    | Danny McClure    | ✓        |  |
| 195  | Confirm that USGS data includes analyses from all 3 labs that have participated in Delta studies: KS, CO, CA.  | 09/25/18 | 10/15/18    | Erwin Roex       | ✓        | Shortly after the meeting, Joe Domagalski confirmed that all 3 were included.  |
| 196  | Joe Domagalski to provide a cross-walk table that relates USGS "parameter codes" to CAS Registry Numbers.  | 09/25/18 | 10/07/18    | Joe Domagalski   | ✓        |  |
| 197  | Where the pesticide data from CEDEN had FRACTION = "not recorded," it may be possible to determine this information based on the project. Danny McClure agreed to help research this.  | 09/25/18 | 10/15/18    | Danny McClure    | ✓        |  |
| 198  | Deltares team to confirm that they are dealing with QA samples appropriately. Some of the data in CEDEN represent samples that were collected for QA purposes, such as field blanks, field duplicates, matrix spikes, etc.   | 09/25/18 | 11/09/18    | Erwin Roex       | ✓        | Include description in next deliverable.   |
| 199  | In some occasions, toxicity identification evaluations (TIEs) were performed as a followup to positive toxicity tests. These data are not readily available via the public interface to CEDEN. Melissa Turner volunteered to help provide these data to Deltares.  | 09/25/18 | 10/15/18    | Melissa Turner   | ✓        | Email reminder sent in Oct 10, 2018  |
| 200  | Some of the values in the "Result" field were negative. Deltares assumed these were errors and deleted them. However, they may be meaningful. Consider investigating these to verify these do not contain some "coded" information. Matt to check with ASC's data management team.   | 09/25/18 | 10/10/18    | Matthew Heberger | ✓        | According to the CEDEN "Chemistry Data Submission Guidance Document," the Result field may be blank. It says nothing about inserting negative values. Project scientists should look at the corresponding values in the field ResQualCode. For information on possible values and their meaning, see:<br><a href="http://ceden.org/CEDEN_Checker/Checker/DisplayCEDENLookup.php?List=ResQualLookup">http://ceden.org/CEDEN_Checker/Checker/DisplayCEDENLookup.php?List=ResQualLookup</a>                     |
| 201  | Distribute to members a "primer" or useful background materials on the use of species sensitivity distributions (SSD) and the multi-species potentially affected fraction (msPAF).   | 09/25/18 | 10/10/18    | Matthew Heberger | ✓        | Compiled a few references via internet search. Emailed research team to ask for other suggestions. Seems best reference is a highly-cited textbook from 2001 by Posthuma et al. Sent to Technical Advisory Committee and Pesticides Subcommittee with a suggestion to begin with Chapters 1 and 16.  |
| 202  | Deltares should consider performing simple analyses that will provide useful information to the Delta RMP and to regulators and paint a more complete picture than would be obtained with only a single method. For example, a simple summary of exceedances of EPA's Aquatic Life Benchmarks. Matt to provide a link or table to Deltares.                            | 09/25/18 | 09/30/18    | Matthew Heberger | ✓        | I confirmed that this is in fact required in their contract. It states that, at a minimum, the investigators shall compare observed pesticide concentrations to appropriate benchmarks.  |
| 203  | Have the Delta RMP science advisors review the proposed methods for the study; invite them to our forthcoming meeting of the Delta RMP.  | 09/25/18 | 10/15/18    | Matthew Heberger | ✓        | Update Oct 16: Erwin has requested postponing this meeting, since they have had trouble compiling the "definitive" database. (Changes keep being made to the toxicity data.)   |
| 204  | The researchers should filter out sampling locations that represent ditches, farm ponds, etc. that are not connected to Delta waterways. The focus should be on Delta surface waters (not groundwater, and not other types of water, such as irrigation water). Matt can share GIS data of surface water features with Deltares that should be helpful for screening). | 09/25/18 | 09/30/18    | Matthew Heberger | ✓        | Emailed the research team information and links to CARI and NHD, two GIS datasets of surface water features.   |
| 205  | Consider rescheduling the Nov 9 Pesticides Subcommittee meeting to a later date, possibly hold a teleconference that day and meet again with Deltares in person at a later date.   | 09/25/18 | 10/25/18    | Matthew Heberger | ✓        | Rescheduled at the request of Erwin Roex. The toxicity data is still not finalized, so they cannot finalize their database and begin their analyses.   |
| 206  |  |          |             |                  |          |  |
| 207  | <input type="checkbox"/> Data Management Subcommittee Action Items   |          |             |                  |          |  |
| 208  | <input type="checkbox"/> Data Management Subcommittee Meeting on 4/25/2018   |          |             |                  |          |  |
| 209  | Send the final meeting summary   | 04/25/18 | 05/10/18    | Matthew Heberger | ✓        |  |
| 210  | Send the Data Management SOP to the group once our QAO has had a chance to review it.  | 04/25/18 | 05/15/18    | Matthew Heberger | ✓        |  |
| 211  | Create some graphics or a flowchart that shows how we manage data  | 04/25/18 | 05/31/18    | Amy Franz        | ✓        |  |
| 212  |  |          |             |                  |          |  |

Delta RMP Steering Committee Meeting Agenda Package for Feb 22, 2019, page 64 of 83

| Task  | Date Created | Due Date | Assigned To      | Status | Comments   |
|---|--------------|----------|------------------|--------|--|
| 213 <input type="checkbox"/> Finance Committee Action Items   |              |          |                  |        |  |
| 214 For the next finance update, also include a project progress update. Highlight progress on deliverables, any changes that have been made to monitoring plans, warning of any delays.  | 05/02/18     | 01/15/19 | Matthew Heberger | ✓      | To be included in the next Finance Update and at subsequent SC meetings. It became clear that the "stoplight reports" are not serving the needs of the group, who wish to have greater insight into project progress. Update Oct 2018: To be included in the next quarterly finance report. Now that we have created a thorough "waterfall" Gantt Chart for the entire project, we will report on "% Complete" and "% of Budget Spent" for tasks and subtasks in future quarterly reports. |
| 215 Create a spreadsheet that we can share with Finance Committee members that show more financial details (Selina to provide template)   | 05/02/18     | 07/15/18 | Matthew Heberger | ✓      | I reminded Selina about this and she no longer remembered what this was.   |
| 216 From now on, do not change budgets unless there has been a major change in scope or deliverables. Keep budgets the same and maybe spend more or less on different tasks and subtasks but don't actually transfer money in the budget. | 07/02/18     | 12/31/18 | Matthew Heberger | ✓      | Implementing this new policy beginning in FY18/19. In the past, we re-allocated funds among subtasks at the request of the Finance Committee. At the time, they preferred that we "move \$2,000 from Task 1A to 1B" rather than simply going overbudget on one task and staying under on another. From our point of view, either practice is acceptable, although the former is simpler.   |
| 217   |              |          |                  |        |  |
| 218 <input type="checkbox"/> Nutrients Subcommittee Action Items  |              |          |                  |        |  |
| 219 Work with Janis to schedule subcommittee meetings for November, February, and March.  | 09/25/18     | 10/15/18 | Matthew Heberger | ✓      |  |
| 220   |              |          |                  |        |  |
| 221 <input type="checkbox"/> CEC Subcommittee Action Items  |              |          |                  |        |  |
| 222 <input type="checkbox"/> CEC Subcommittee Meeting 8/22/2018   |              |          |                  |        |  |
| 223 Consult with colleagues to provide a review of the budget with consideration of a more detailed plan  | 08/22/18     | 08/31/18 | Matthew Heberger | ✓      |  |
| 224 Develop a timeline/Gantt Chart prior to the Joint Meeting to include interim deliverables and points for stakeholder input.   | 08/22/18     | 10/15/18 | Matthew Heberger | ✓      |  |
| 225 Provide a timeline for the QAPP and information that can be provided to the Joint Meeting   | 08/22/18     | 10/15/18 | Matthew Heberger | ✓      |  |
| 226 Develop a budget for Prop 1 application and notify the co-chairs and Finance Committee of intent to apply.  | 08/22/18     | 10/26/18 | Matthew Heberger | ✓      |  |
| 227 Fill in technical details for the sampling plans including sampling methods and number of clams needed  | 08/22/18     | 01/30/19 | Matthew Heberger | ✓      |  |
| 228 Ask Melissa Morris whether an individual QAPP or a QAPP added to the Delta RMP is preferred.  | 08/22/18     | 08/31/18 | Dawit Tadesse    | ✓      | Confirmed 23 August 2018 the QAPP should be developed as an individual plan  |
| 229 Provide a link to the Hood CEC study.   | 08/22/18     | 08/31/18 | Brian Laurenson  | ✓      | Link sent via email on 22 August 2018.   |
| 230 Provide CEC Reports from Region 1 and Region 4.   | 08/22/18     | 08/31/18 | Dawit Tadesse    | ✓      | Reports sent via email on 23 August 2018   |
| 231 Update the CEC subcommittee on progress regarding the SEP policy amendment and development of the SEP proposal.   | 08/22/18     | 09/30/18 | Patrick Morris   | ●      |  |
| 232 <input type="checkbox"/> CEC Subcommittee Meeting 10/10/2018  |              |          |                  |        |  |
| 233 Prepare a proposed schedule (Gantt chart) with interim deliverables and opportunities for input for the CEC Subcommittee to review before inclusion in the agenda package for the SC/TAC Joint Meeting                                | 10/10/18     | 10/16/18 | Matthew Heberger | ✓      |  |
| 234 Work with Brian Laurenson on a report out for the SC/TAC Joint Meeting  | 10/10/18     | 10/21/18 | Matthew Heberger | ✓      |  |
| 235 Obtain letters of support for the CEC Prop 1 grant proposal   | 10/10/18     | 10/21/18 | Matthew Heberger | ✓      |  |

# Materials for Agenda Item 8

# Meeting Summary

of an ad hoc subcommittee of the Delta RMP Steering Committee created to examine the policies and procedures around adding new seats to the Steering Committee.

Wednesday December 19, 2018

## In attendance:

- Dave Tamayo, Sacramento County Stormwater Program
- Debbie Webster, Central Valley Clean Water Association
- Greg Gearheart, State Water Resources Control Board, Office of Information Management and Analysis
- Matthew Heberger, Aquatic Science Center
- Patrick Morris, Central Valley Regional Water Quality Control Board (Regional Board)
- Selina Cole, Regional Board
- Stephanie Hiestand, City of Tracy Stormwater Program

On this morning teleconference, a group of volunteers met to discuss an issue that arose at the October 29, 2018 SC meeting where staff proposed adding 3 new seats to the SC, and some members expressed objections to the process by which this proposal came to the SC. Patrick Morris and Matthew Heberger had written a brief [memo](#) with some ideas to frame the discussion.

The group discussed what the "guiding principles" should be for the makeup and operation of the Steering Committee. There was discussion of the desirability and practicality of attempting to better represent a wider range of Delta stakeholders beyond those currently at the table. The RMP should not be framed as a stakeholder process with 'pay to play' seats- this influences perception of the validity of the program and could limit funding from science based interests. The benefits of the RMP need to be the programs focus.

Members reiterated that important decisions should be made openly and transparently, and should not be presented to the SC as if they are foregone conclusions.

Others suggested that overall governance of the program could be improved through a more formal and binding legal document such as a memorandum of understanding. However, a formal MOU could be cumbersome and could inhibit participation. DWR, in its negotiations, requested 3 seats, but the SC elected to assign them 2, and they are satisfied.

Overall, the group agreed that no immediate changes are needed. There was little or no enthusiasm for any of the suggestions in the Nov 28 memo which described different alternatives for allocating SC seats among participant groups.

It was noted but that decision-making could be improved, and that a continued emphasis on governance is important. Suggestions included giving the SC more notice of large and important decisions. [Matt's note: This seems similar to the way many legislatures operate, where bills undergo multiple [readings](#). This could help avoid the feeling that important

decisions have been thrust upon you. However, it may not be practical with a group that meets only quarterly, as it would take up to 6 months to make any important decision.]

Some members suggested that the Charter could be expanded, while others stated that it is already long enough and that it is broad and flexible; defining complicated decision-making processes for everything would be cumbersome and limit our flexibility. If the edits to the Charter are needed, there was a suggestion to work on principles first before seating and voting guidelines. If the edits to the Charter are needed, there was a suggestion to work on principles first before seating and voting guidelines.

### Action Item:

- Send Matt suggestions or proposed revisions to the Charter related to SC decision-making and governance, particularly as it relates to the creation of new seats on the Steering Committee (all members, by Jan 15, 2019)

### Next Meeting:

- Thurs Jan 31, 2019, 3:30pm - 4:30pm  
<https://join.me/sfei-conf-cw2>, +1.415.594.5500 Access Code: 238-626-034#

# Meeting Summary

Second meeting of the ad hoc workgroup on Delta RMP Governance  
Thursday, January 31 · 3:30 – 4:30pm

## In attendance:

- Dave Tamayo, Sacramento County Stormwater Program
- Selina Cole, Central Valley Regional Water Quality Control Board
- Debbie Webster, Central Valley Clean Water Association
- Matthew Heberger, Aquatic Science Center
- Stephanie Hiestand, City of Tracy stormwater program
- Dan Riordan, Department of Water Resources
- Rebecca Franklin, Regional San
- Greg Gearheart, State Water Resources Control Board, Office of Information Management and Analysis

## Steering Committee Seats

Confirmed that the group does not have a recommendation at this time regarding the number of seats or the makeup of SC membership.

Several agreed that current size of the SC is perhaps too large (16 voting members), but we do not want to “rock the boat” at this time. Other similar decision-making bodies do have smaller numbers, and this makes it easier to reach consensus.

It was suggested that we need to work on *process (i.e. guiding principles)* instead rather than focusing on numbers of voting members.

It was further suggested to add a seat for “science/research” that would be filled by a representative from the Delta Science Program. Central Valley Board staff have been in discussions with DSP about potentially contributing to the program. The group was generally supportive of providing a way for the DSP to participate in the RMP, although adding a seat *does* exacerbate our concern about the SC getting too big.

**Action Item:** Matt will add the possibility of adding a seat (voting/non-voting/advisory or possibly as part of the TAC) for “science/research” to the SC agenda as a discussion item. [Note: The coordinating committee decided at its Feb 5, 2019 meeting that this item is not ripe for discussion by the SC at its Feb 22 meeting, as Central Valley Water Board staff are still in discussions with the Delta Science Program about contributing to the Delta RMP.]

## Recommendations related to the Charter

Comments and suggestions by committee members can be seen here:

<https://docs.google.com/document/d/18WGS8FH4dnjLhcxXgoidLL-JLhZC0vvBKS2BnvgZ37U/e/dit>

Discussion of the “adequate participation” clause in the Charter: There was a suggestion by one member to remove this section. However, the real concern was that we should avoid giving the impression that decision making by the Delta RMP is purely “pay to play” and that the number of seats for an interest group is proportional to their contribution.

**Action Item:** Members should continue to review the Charter and add comments and suggestions. In particular, Stephanie Hiestand will review the section on adequate participation.

One issue raised by a participant is that the communications plan says that monitoring data won't be made available to the public until SC votes to approve its release. This may not actually be legal. It is felt that it is OK to have SC approve reports and other communications products but *not* data. Once data has passed QA review, they should be public. The Charter should state something along the lines of: This Charter and the Communications plan do not supersede the need to make data available to the public in a timely manner. It was noted that in September of this year, the Open and Transparent Data law (AB 1755) goes into effect.

**Action Item:** ASC staff to craft some language related to this and add it to the draft amended Charter.

## “Readings”

The group briefly reviewed Matt's suggestion that potentially difficult or controversial decisions be subject to [readings](#), similar to the way bills are considered by legislatures. In this way, proposals are introduced, debated and discussed, then subsequently amended and voted upon later. However, this could be onerous and slow for a decision-making body meets quarterly; it could take 6 to 9 months to make decisions.

It was agreed that, while this is a useful concept, it would be difficult to put into practice. The suggestion was that, when staff anticipate there will be a potentially difficult or controversial decision, that they should send a memo or other written communication to the SC early, with the opportunity to comment and give feedback. This way, SC members won't be seeing it for the first time as part of the agenda package only a week before the meeting.

Finally, it was agreed that Matt should give the report back to the SC at the February meeting. He will briefly describe the group's deliberations and recommendations. Other members are of course welcome to weigh in if they like.

## MEMO

To: Delta RMP Volunteer Committee on Steering Committee Membership  
From: Matthew Heberger, ASC, and Patrick Morris, Central Valley Water Board  
Date: November 28, 2018  
Subject: Some considerations on distributing SC seats among participant categories

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At the October 29, 2018 Steering Committee (SC) meeting, staff proposed adding 3 new voting members (or “seats”) to the SC. These seats were for a new participant category “flood control and habitat restoration” and were meant to be filled by staff from the Department of Water Resources (DWR) who had recently agreed to contribute \$200,000 per year to the program.

Several SC members expressed their opposition. Ultimately, the SC voted to add one seat and to allow DWR to fill the vacant “Water Supply” seat. The SC members directed staff to develop a draft policy for a more formal process for determining how new participants join the Delta RMP, and how many votes each participant category should have.

This memo contains some information and ideas that may be useful as we craft a new policy.

First are some “guiding principles” or thoughts for how the SC would operate in an ideal world.

Next are excerpts from the Charter that describe the current makeup of the Steering Committee and policies for membership. Note that the Charter does not prescribe a process that the SC should use to change the makeup of the SC beyond “using its decision-making procedures to change the Charter.”

Following this, Table 1 shows the current makeup of the SC, along with each participant category’s financial contribution and number of seats.

Table 2 has some straw-man proposals that we brainstormed for alternative ways that seats might be distributed.

## Guiding Principles

As we make changes to the governance of the program, it is worth considering what the overarching goals should be. We propose the following principles that should guide the makeup of the Steering Committee. The Steering Committee and its decision-making should be:

- Fair and Equitable
- Representative
- Efficient
- Transparent
- Consensus-oriented
- Inclusive
- Participatory

Regarding *fairness* and *equity*, participants probably believe that the more they contribute financially, the more influence they should have. There is a precedent for this, especially in the corporate world. When shareholders vote on matters of corporate policy, each gets one vote per share. Arguably, Delta RMP's larger financial contributors also represent a larger population of residents or ratepayers. This may also be an argument in favor of allocating seats in proportion to financial contribution, as it is a proxy for population.

The number of members can have a strong influence on *efficiency* of decision-making, *inclusivity*, and *participation*. When there are more than 12-15 people at the table, there simply is not enough time for everyone to speak and be heard. Therefore, it may be desirable to cap the total number of seats in order that the SC can function effectively. Even if fewer than the current 16 seats are considered for the future, all interests and perspectives will need to be adequately represented in final decision making.

At present, the Delta RMP governing body is not truly *representative* of all stakeholders with an interest in Delta water quality. Voices that are notably absent include:

- Environmental advocates
- Local residents
- Fishing and Recreation

While currently we have not identified an entity or organization that would be interested in representing these groups, this could be a topic for a future discussion.

## Excerpts from Charter

### **Definitions (section 2):**

“Participants” means individual agencies or organizations that provide financial contributions and/or in-kind services for Delta RMP activities, which includes regulatory agencies, resource agencies, water suppliers, coordinated monitoring programs, wastewater treatment agencies, stormwater municipalities, dredgers, and irrigated agriculture coalitions.

“Participant Groups” means groups of similar types of Participants such as publicly owned treatment works (POTWs), stormwater agencies, agricultural coalitions, water suppliers, dredgers, coordinated monitoring programs, and regulatory agencies.

“Regulatory Agencies” means agencies administering state and federal water quality regulations, i.e. Central Valley Regional Water Quality Control Board, State Water Resources Control Board, and United States Environmental Protection Agency.

“Resources Agencies” means a state or federal agency responsible for the conservation, management, and enhancement of natural and cultural resources; including land, wildlife, water, and minerals.

### **Membership (section 7.A.1)**

The Steering Committee has seats for representatives from each of the following Participant Groups:

- 3 seats for publicly owned treatment works (POTWs) ideally representing small, medium and large POTWs;
- 3 seats for stormwater agencies, ideally one representing large cities and two representing smaller cities;
- 1 seat for coordinated monitoring;
- 1 seat for water suppliers;
- 1 seat for dredgers;
- 2 seats for irrigated agriculture;
- 1 seat for flood control and habitat restoration;
- 1 seat for the resources agencies (NOAA Fisheries, California Department of Fish and Wildlife); and
- 3 seats for regulatory agencies (USEPA, State Water Resources Control Board, and Central Valley Regional Water Quality Control Board).

Each SC member is responsible for working with agencies in their Participant Group to bring common interests forward. The SC may add seats for other Participant Groups or adjust the

number of seats for certain Participant Groups by using its decision-making procedures to change the Charter.

Table 1. Current Delta RMP Participating Categories and Financial Contributions

| Participant Category              | Number of seats | 2018 Total Contributions | SC Seat (primary)  | Number of Paying Entities in Category                                      | Contribution per voting Seat | Average Contribution per entity |
|-----------------------------------|-----------------|--------------------------|--|--|------------------------------|---------------------------------|
| Flood Control/Habitat Restoration | 1               | \$100,000                | DWR  | 1  | \$100,000                    | \$100,000                       |
| Water Supply                      | 1               | \$100,000                | DWR  | 1  | \$100,000                    | \$100,000                       |
| Stormwater                        | 3               | \$571,400                | Small: El Dorado County<br>Med: City of Tracy<br>Large: Sacramento County          | Small and Med: 24<br>Large: 4 (inc. Caltrans)                              | \$190,500                    | \$20,400                        |
| Regulatory Agencies               | 3               | \$315,000                | Regional Board<br>State Board<br>USEPA <sup>1</sup>                                |  | \$157,500                    | \$157,500                       |
| Wastewater                        | 3               | \$197,076                | City of Davis<br>City of Stockton<br>Regional San                                  | 15 WWTPs   | \$65,700                     | \$13,100                        |
| Agriculture                       | 2               | \$148,780                | Westside San Joaquin<br>River Coalition<br>San Joaquin County &<br>Delta Coalition | 4 coalitions   | \$74,400                     | \$37,200                        |
| Dredgers                          | 1               | \$63,000                 | Port of Stockton   | Ports of Sacramento and<br>Stockton, USACOE <sup>3</sup> , (Yacht<br>Club) | \$63,000                     | \$21,000                        |
| Resource Agencies                 | 1               | N/A                      | CDFW, NOAA <sup>1,2</sup>  |  |                              |                                 |
| Coordinated Monitoring            | 1               | N/A                      | DFW-IEP <sup>1, 2?</sup>   |  |                              |                                 |

**Notes:**<sup>1</sup> Agency does not vote on financial issues<sup>2</sup> Currently vacant<sup>3</sup> Army Corps provides \$45,000 equivalent in-kind to USGS

# Materials for Agenda Item 9

# **1 - Assessing spatial variability of nutrients and related water quality constituents in the Delta at the landscape scale: Cross-Delta Monitoring Using High-Frequency Tools**

## **Project Team:**

Bryan Downing, Brian Bergamaschi, Tamara Kraus

U.S. Geological Survey, Sacramento, CA

## **Executive Summary**

This proposal is 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. Measurement will include nitrate, ammonium, phosphate, temperature, conductivity, dissolved oxygen, chlorophyll, blue-green algal pigments, particle size and others. Data-collection cruises will be conducted under three different environmental/flow conditions.

## **Background and Motivation**

Monitoring stations and research sampling cruises in the Delta and Estuary are typically limited by the necessity to make measurements in a small number of well-mixed channels in the interest of collecting “representative” data and samples. Further, data collection is often conducted at locations occupied by historical data-collection efforts to preserve comparability. The result is that we know little about the spatial variability of important water quality parameters in the Delta, and do not know how they vary under different flow and export conditions except through models. Also, historical station locations may no longer be representative as conditions may have changed due to variation in sources and changes in flow patterns. Spatial data will be highly useful for determining future monitoring locations.

## **Objectives**

The objective of the project is to document the spatial variability of nutrients for the purpose of evaluating longitudinal transformation in nutrient concentrations, forms and ratios in different zones within the Delta. The goal is to identify “hot spots” of nutrient transformation and to locate internal sources and sinks for nutrients within the Delta.

## **Applicable Management Decisions and Assessment Questions**

*Management Drivers*

Delta Nutrient Research Plan

*Assessment Questions*

Status and Trends

1. How do concentrations of nutrients (and nutrient-associated parameters) vary spatially and temporally?
  - a. Are trends similar or different across subregions of the Delta?
  - b. How are ambient levels and trends affected by variability in climate, hydrology, and ecology? *Study relates nutrient demand to landscape elements.*

#### Sources, Pathways, Loadings & Processes

1. Which sources, pathways, and processes contribute most to observed levels of nutrients?
  - f. What are the types and sources of nutrient sinks within the Delta?

#### Forecasting Scenarios

1. How will ambient water quality conditions respond to potential or planned future source control actions, restoration projects, and water resource management changes? *Study provides baseline data against which to evaluate change.*

### Approach

The approach is to make high frequency (1/sec) measurements from a high-speed boat across broad areas of the Delta. This is made possible through the recent development of a boat-mounted flow-through sampling system that can be operated at high speeds (~20 mph), permitting rapid collection of high-quality measurements over large regions, within the context of a single tide. The resulting data is then mapped to the simultaneously-collected geositional data (GPS) to generate maps with high spatial resolution (see example in Figure 1). On-board instruments will measure for nitrate, ammonium, temperature, conductivity, dissolved oxygen, chlorophyll-a, blue-green algal pigments, particle size and others. Transects of the North, Central, and South Delta will be conducted three times on three successive days in May, August and October corresponding to periods of high nutrient transformation based on analysis of historical data.

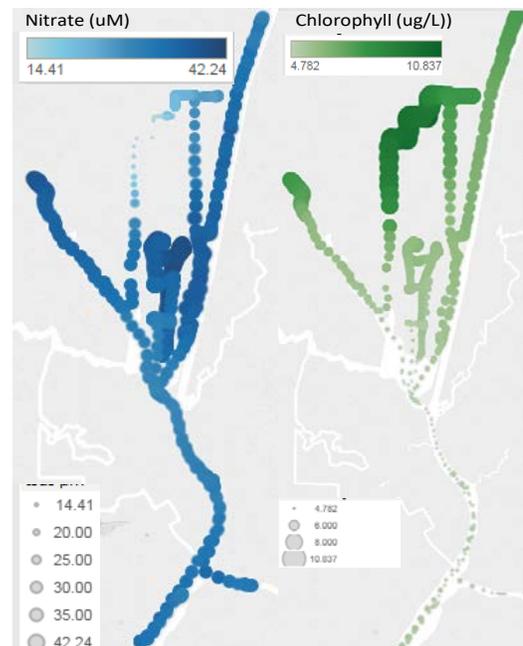


Figure 1. Maps of nitrate (left) and chlorophyll in the North Delta. Both size and color correspond to measured value.

## ONBOARD MEASUREMENTS

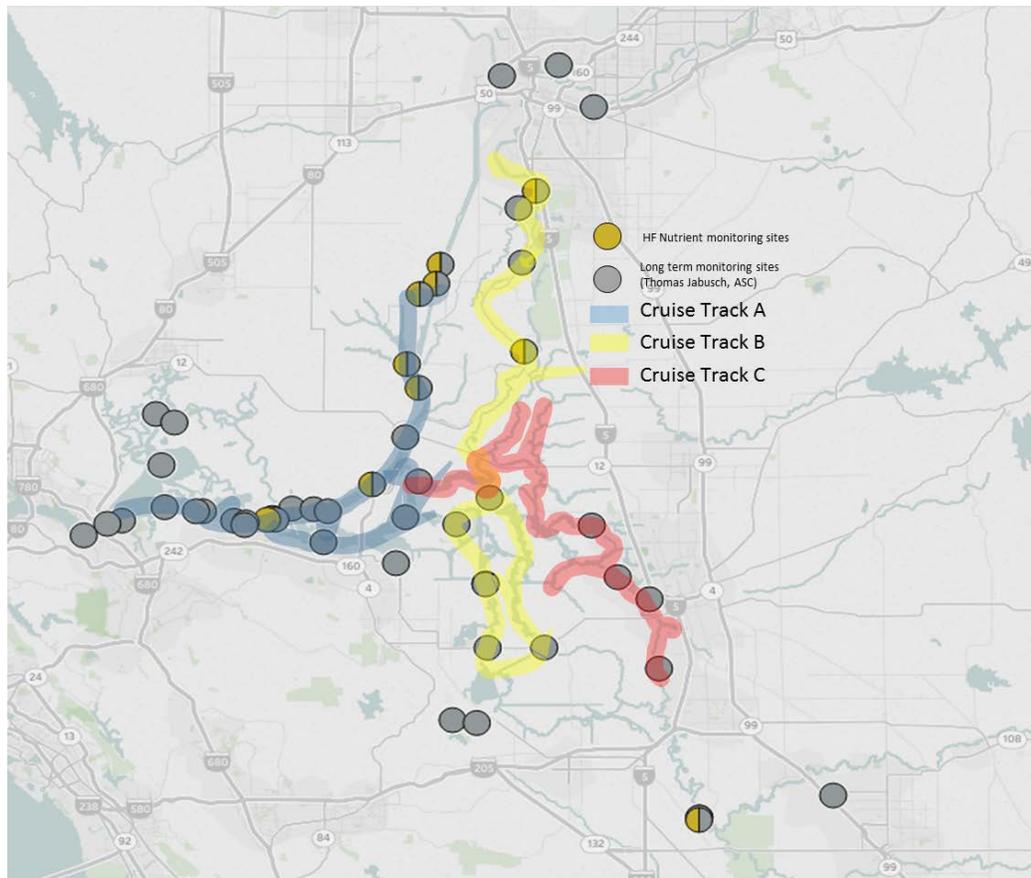
| Parameter                                       | Instrument   |
|---|--|
| Temperature                                     | YSI EXO 2; Seabird model 45 Thermo Salinograph                               |
| Specific Conductivity                           | YSI EXO 2; Seabird model 45 Thermo Salinograph                               |
| pH  | YSI EXO 2  |
| Dissolved Oxygen                                | YSI EXO 2  |
| Turbidity                                       | YSI EXO 2 Turbidity: WetLabs beam transmissometer (676 nm)                   |
| Chlorophyll-a                                   | YSI EXO 2 Total Algae probe; WETLabs model WETStar Chlorophyll-a fluorometer |
| Phycocyanin                                     | YSI EXO 2 Total Algae probe  |
| Fluorescence of dissolved organic matter (FDOM) | YSI EXO 2; WETLabs model WETStar cDOM fluorometer                            |
| Nitrate   | Satlantic model ISUS V3, Nitrate analyzer                                    |
| Ammonium  | Timberline TL-2800 Analyzer  |

## SAMPLE COLLECTION

At equal spatial intervals, 50 samples will be collected during each transect and analyzed for total phosphate. Approximately 10 samples will be collected during each transect and analyzed for nitrate, ammonium, and total chlorophyll, with selected samples analyzed for large particulate chlorophyll (>5uM) and picocyanobacterial cell density.

| Laboratory analyses |                          |
|---------------------|--------------------------|
| <i>Analyte</i>      | <i>Number of samples</i> |
| Nitrate             | 90                       |
| Ammonium            | 90                       |
| Phosphate           | 450                      |
| Chlorophyll - total | 90                       |
| Chlorophyll - >5uM  | 45                       |

## Proposed Cruise Tracks



**Figure 2, Proposed 3 day cruise track for “Assessing spatial variability of nutrients and related water quality constituents in the Delta at the landscape scale”**

Three cruise tracks are proposed. Planned cruise tracks will be finalized in consultation with the RMP nutrient subcommittee. Tracks are subject to change due to navigational- or safety-related issues. Additional areas may be covered as time permits.

- Track A (~75 miles) covers the two major nutrient gradients in the northern Delta: the gradient of declining nitrate and ammonium between the main stem of the Sacramento River and the Cache Slough complex caused by uptake and loss, and the gradient from the main stem of the Sacramento River and Suisun Bay, as defined – we suspect – largely by mixing, and where there is most concern about the effects of ammonium inputs. Significantly, the results should permit explicit calculation of effective ammonium transformation into this area.
- Track B (~60 miles) covers the area immediately above the Regional SAN WWTP and generally follows the path water is drawn across the Delta to the Banks Pumping Plant, down Georgiana Slough, Old and Middle Rivers to Clifton Court. The intent of this cruise

track is to observe the fate of WWTP-derived nutrients as they transit the Delta and assess the causes associated with this nutrient gradient.

- Track C (~65 miles) covers the gradient of San Joaquin River-derived nutrients into the central part of the Delta, and explores potential attenuation of this material in western Delta habitats. It also covers regions in the central Delta not served by long term monitoring and permits comparison of the Mokelumne to the Cosumnes systems.

### **Data Quality Objectives**

Laboratory measurements will be made at the USGS national water quality laboratory. Performance criteria require accuracy to within 5% of the measured value at 3 times the method reporting limit. Underway instruments are calibrated prior to use and are accurate to <2% of the full scale value. Uncertainty due to analytical errors in underway instrumentation is included in the replication inherent in high frequency sampling, and is reported together with natural variation as standard deviation across averaging periods. Underway instrument performance will be validated against laboratory values and the uncertainty published in the report. Analysis of spatial variation will use this uncertainty to only highlight statistically significant variations that exceed uncertainty. The cumulative uncertainty will be estimated in quadrature or using Monte Carlo simulations over the domain of the uncertainty of the individual measurements. This cumulative uncertainty will be used to assess the statistical significance of spatial variation with a defined threshold of  $p < 0.001$ .

### **Reporting/Deliverables**

The deliverables for the project will be a draft report, electronic versions of maps produced by the project, and corresponding data files containing constituent concentration data and location information.

The report will consist of the following elements:

- An introduction briefly describing the background, goals and objectives for the project.
- A description of the methods used to collect and process the data associated with the project.
- Maps of the spatial distribution of nutrient concentrations, forms and ratios across the Delta as well as graphs showing longitudinal transformations.
- A discussion of the results of the study, with special attention to describing potential processes in areas with high apparent rates of nutrient concentration change as well as the processes that may be responsible for that change.

### **Budget**

The requested USGS budget for this project includes salary, supplies, analytical services, and operational costs for a vehicle and boat. Total costs for the project mapping and data processing component for three seasonal sampling campaigns and preparation of the study report are \$195,000.

Costs for the ASC to handle the USGS report and manage data will be included in the Delta RMP FY17/18 budget under Core Functions, and thus are not a part of this project budget.

Table 2. Options for number of seats

| <b>Participant Category</b>         | <b>Option A<br/>status quo</b> | <b>Option B<br/>equal<br/>number of<br/>votes</b> | <b>Option C<br/>Votes<br/>proportiona<br/>l to<br/>contribution<br/>(rounded)</b> | <b>Option D<br/>Votes<br/>proportiona<br/>l to number<br/>of entities</b> | <b>Option E<br/>%of budget<br/>(&gt;15% = 2<br/>seats)</b> | <b>Option F<br/>??</b> |
|-------------------------------------|--------------------------------|---|---|---|--|------------------------|
| Flood Control/Habitat Rest.         | 1                              | 1   | 1   | 1   | 1  |                        |
| Water Supply                        | 1                              | 1   | 1   | 1   | 1  |                        |
| Stormwater                          | 3                              | 1   | 6   | 2   | 2  |                        |
| Regulatory Agencies                 | 3                              | 1   | 4   | 1   | 2  |                        |
| Wastewater                          | 3                              | 1   | 2   | 1   | 1  |                        |
| Agriculture                         | 2                              | 1   | 2   | 1   | 1  |                        |
| Dredgers                            | 1                              | 1   | 1   | 1   | 1  |                        |
| Resource Agencies <sup>1</sup>      | 1                              | 1   | 1   | 1   | 1  |                        |
| Coordinated Monitoring <sup>1</sup> | 1                              | 1   | 1   | 1   | 1  |                        |
| <b>Total</b>                        | <b>16</b>                      | <b>9</b>  | <b>19</b>   | <b>10</b>   | <b>11</b>  |                        |

**Notes:**

<sup>1</sup> Agency does not vote on financial issues