Overview

- The SWAMP QA Requirements
- Assessing the Laboratory
- Methods for Assuring Compliance with QA Requirements
- Example Program-Practical Application Exercise
Outcome

- How to identify relevant SWAMP QA requirements
- Which QA requirements need to be communicated to the contractor
- Methods for ensuring the requirements are understood and followed
- How to work with a laboratory over the duration of a project
- How to work through problems with a laboratory
Terms

- QAPrP = QA Program Plan
- QAPP = QA Project Plan
- MQO = Measurement Quality Objectives
- SOP = Standard Operating Procedure
- Method = standardized method for sample collection or analysis
- Parameter = analyte/chemical along with a matrix (freshwater/sediment/tissue)
- MDL = Method Detection Limit
- RL = Reporting Limit
- Real-time QC = immediately when issue arises (i.e., right away)
- SWAMP Help Desk
  - SWAMP QA Help Desk
    - (swampQA@mlml.calstate.edu)
  - SWAMP Data Management Help Desk
    - (SWAMPHelpDesk@mlml.calstate.edu)
Three Keys to Success

- Real-time QC
- Communication
- No surprises

 QC issue → Real-time communication → Project Manager → No surprises
Project Manager Responsibility

- Sets a “no surprises” policy via real-time QC communication
- Knowledgeable on necessary lead and turnaround times
- Awareness of tools
- Familiarity with SWAMP QAPrP, database management plan, and QAPP(s) (if applicable)
- Familiarity with relevant project and SWAMP standard operating procedures (SOPs)
- Initiation of a project QAPP if necessary
- Knowledgeable on corrective action and payment obligations
- Routine contact with laboratory and sampling crew
- Communication with laboratories and field crews when QA requirements are not met
- Putting together kick-off and mid-project meetings
- Communication with the project QA Officer when systemic QA issues are identified
- Initiation of the corrective action process when isolated QA issues are identified
Laboratory and Field Crew Responsibilities

- Follows a “no surprises” policy using real-time QC communication
- Awareness of tools
- Familiarity with SWAMP QAPrP (particularly appendices A-D), database management plan, and QAPP(s) (if applicable)
- Preparation of elements for project QAPP if needed
- Knowledgeable on relevant project and SWAMP SOPs
- Communication of utilized methods and internal SOPs
- Knowledgeable on necessary lead and turnaround times
- Knowledgeable on necessary holding times
- Knowledgeable on corrective action and payment obligations
- Routine contact with Project Manager and Project QA Officer
- Communication with project management when QA requirements are not met (in real time!)
- Communication with Project QA Officer when systemic QA issues are identified
- Initiation of the corrective action process when isolated QA issues are identified
The SWAMP QA Requirements

- Where do I find the SWAMP QA requirements?
- What requirements do the laboratory or field crew need to meet?
- How should these requirements be communicated?
- QA requirements for non-SWAMP parameters?
Where Do I Find the SWAMP QA Requirements?

- **SWAMP 2008 QA Program Plan**
  - [http://www.waterboards.ca.gov/water_issues/programs/swamp/tools.shtml#qa](http://www.waterboards.ca.gov/water_issues/programs/swamp/tools.shtml#qa)
  - Google search: SWAMP QAPrP

- **Look in the appendices**
  - Appendix A: Measurement Quality Objectives Tables
  - Appendix B: Sample Handling

- **Bioassessment, algae, P-Hab**
  - [http://swamp.mpsl.mlml.calstate.edu/resources-and-downloads/standard-operating-procedures](http://swamp.mpsl.mlml.calstate.edu/resources-and-downloads/standard-operating-procedures)
  - Google search: SWAMP Bioassessment SOP

- **Call/email the SWAMP QA Help Desk**

- **Read the SWAMP-Comparability FAQ**
  - [http://swamp.mpsl.mlml.calstate.edu/faqs](http://swamp.mpsl.mlml.calstate.edu/faqs)
State Board SWAMP Website

Slide 10
# Measurement Quality Objectives: SWAMP Examples

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QA Program Plan Appendix A: Measurement Quality Objectives (Page 59)
## Holding Times: SWAMP Examples

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<td>Sodium</td>
<td>mg/L</td>
<td>Polyethylene Bottles Glass or plastic filtering apparatus are recommended to avoid possible contamination.</td>
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<td>6 months</td>
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<td>Turbidity</td>
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*QA Program Plan Appendix B: Sample Handling (Page 92)*
Quality Assurance

The Surface Water Ambient Monitoring Program Quality Assurance Program Plan (GAPrP) serves as an umbrella document for use by each of SWAMP’s contributing projects. It describes the program’s quality system in terms of organizational structure; the functional responsibilities of management and staff; the lines of authority; and the interfaces for those planning, implementing, and assessing all activities conducted.

Quality Assurance Project Plan Guidance
A quality assurance project plan (QAPP) is required for certain large, ongoing, or special projects conducted by the Regional Water Quality Control Boards (Regional Boards) or contractors under SWAMP. To streamline the creation of these documents, SWAMP encourages the use of its own standardized review checklist, QAPP template, and SWAMP Advisor Expert System.

Quality Assurance Report Template
The SWAMP Data Management Team (DMT) and Quality Assurance Team (QAT) have created templates for the Quality Assurance section of the SWAMP Regional Report. To ensure consistent presentation and reporting of quality assurance (QA) data, these templates include a narrative and table.

Data Verification and Validation Systems
SWAMP plans to employ three stages of data review: first-party review in the laboratory or field, second-party review by the SWAMP DMT, and third-party validation on a percentage of data by the SWAMP QAT.

Systems Assessments
The SWAMP QAT performs periodic onsite and remote quality system assessments of the program’s major contract laboratories.
What Requirements do the Laboratory or Field Crew Need to Meet?

- Sample Handling
  - Preservation
  - Holding time

- Method Requirements

- All QC samples as required by SWAMP and method (whichever if more strict)

- Field crew and lab staff must be knowledgeable in SWAMP QC requirements
  - SOPs if doing bioassessment, etc.
  - MQOs
How Should These Requirements Be Communicated?

- **Project Management Responsibility**
  - Spoon-feed the information
  - Set a “no surprises” policy
  - Develop timely and open communication: real-time QC

- **Kick-off Meetings**
  - For SWAMP comparability work, check-in with the SWAMP QA Help Desk prior to kick-off meetings

- **Documents (and READ them!)**
  - QAPrP
  - QAPP
  - Contract
QA Requirements for Non-SWAMP Parameters

- Methods

- Establish own for project

- SWAMP Help Desks are not set-up to provide assistance for non-SWAMP parameters

- Marine
  - SWRCB Ocean Plan
  - Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan
  - National Coastal Assessment Quality Assurance Project Plan 2008-2012. EPA/841-R-09-004
Assessing the Laboratory

- How do I know if the lab is good or bad? Certification?
- Assessing the organizational structure of the laboratory
- Assessing the “QA acumen” of the laboratory
- Assessing if the laboratory will deliver adequate customer service
- Assessing if the laboratory will meet reporting requirements
Assessing the Organizational Structure of the Lab

- Is there a QA Officer and does that position have a direct line to management? No
- Does the QA Officer have other job duties?
- Is there a lab liaison or Project Manager dedicated to your project?
- Where in the organizational structure is data review performed?
Assessing the “QA acumen” of the Laboratory

- What is the experience of the analysts? Can they supply CVs?
- Are there a QA documents (SOPs, QA Plan)?
- Does the lab provide QC reports along with samples?
- Is the lab already familiar with SWAMP (do they run other SWAMP samples)?
- Does the lab check QC samples in real-time?
- Does the lab participate in PT or intercomparison studies?
- What is the data review process?
- Has the lab been audited?
Assessing if the Laboratory will Deliver Adequate Customer Service

- Is your project assigned one liaison who will manage the work within the lab?

- What are the expected turn around times?

- Will the lab or field crew contact you immediately when something goes wrong?
  - Real-time QC
  - Communication
  - No surprises

- Do they have the capacity/redundant instrumentation/LIMS?

- Will they be subcontracting any of your work?
Assessing if the Laboratory will Meet Reporting Requirements

- Do they have a LIMS?
- Where are you reporting your data to?
- Will the lab take time to get trained in reporting formats?
- Who will do the reporting? Designated staff? PM, QAO, etc.
- Does your project need data reported within a given time frame?
Methods for Assuring Compliance with QA Requirements

- Contracts
- SWAMP QA Program resources
Contracts

- Specifying Quality Control requirements directly in the contract language is beneficial in two ways
  - Improves communication between project management and contractors
  - Prompts the project management and contractors to clarify important project details

- Contractual Requirements
  - MQOs
  - Holding Times
  - Methods (when appropriate – no SWAMP parameter)
  - Communication
  - Reporting Limits
  - Reporting Formats & Timelines
  - Subcontracting work
SWAMP QA Program Resources

- SWAMP 2008 QA Program Plan
- SWAMP QA Help Desk
- SWAMP QAPP Template
- SWAMP Advisor (software that helps you write a QAPP)
- SWAMP Web Site (Google search: SWAMP QA Help)
  - http://swamp.mpsl.mlml.calstate.edu/
State Board SWAMP Website
Quality Assurance

The Surface Water Ambient Monitoring Program Quality Assurance Program Plan (QAPP) serves as an umbrella document for use by each of SWAMP’s contributing projects. It describes the program’s quality system in terms of organizational structure; the functional responsibilities of management and staff; the lines of authority; and the interfaces for those planning, implementing, and assessing all activities conducted.

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SWAMP QA Program Resources

- SWAMP 2008 QA Program Plan
- SWAMP QA Help Desk
- SWAMP QAPP Template
- SWAMP Advisor (software that helps you write a QAPP)
- SWAMP Web Site (Google search: SWAMP QA Help)
  - http://swamp.mpsl.mlml.calstate.edu/
How to work through problems with lab

- Assess the problem
  - Did they alert you regarding the issue as soon as possible, or did you find out long after when you received your results?
  - Is the source of the problem an honest accident (e.g., broken bottle), or a blatant oversight (e.g., neglecting to run the requested QC)?

- Discuss issue with your lab representative
  - Good labs will own up to problems with data
  - Corrective action will depend on nature of problem and the impact on data
  - Opportunity to discuss how to avoid such problems in future
  - Should you be talking with the staff that performs actual work?

- Remember, you are the client
  - Business/client relationship
  - Does your contract allow withholding payment?
Example Program-Practical Application Exercise

- Project determined with parameter list, study design, reporting limits, and data submission formats
- Know you want to be SWAMP-comparable
- You do not have a QAPP yet (and you may not need one)
- Parameters:
  - Caffeine in freshwater
  - Orthophosphate (Total, as P) in freshwater
  - Zinc (Total and Dissolved) in freshwater
Step-by-step Process
Part 1 Identify Requirements

- Identify if parameter is covered by SWAMP

  No
  • Identify method/other requirements for parameter
  • Identify parameter RL
  • Supply requirements to lab & field crew

  Yes
  • Identify all SWAMP requirements for parameter
  • Identify reporting requirements
  • Identify parameter RL
Step-by-step Process
Part 2 Discuss Requirements & Establish MQOs

- Set up preliminary meetings w/lab & field crew
- Determine if project needs a QAPP
- Establish MQOs
- Pick project lab & field crew
- Draft Contract
Step-by-step Process
Part 3 Use Three Keys to Success

- Hold Project Kick-off Meeting
- Make necessary adjustments
- Hold Mid-project Meeting
- Make necessary adjustments

- Real-time QC
- Communication
- No surprises
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  - Identify reporting requirements
  - Identify parameter RL
How do I know if the parameter is covered by SWAMP?

- Look in SWAMP parameter (analyte/matrix) lists in appendices of SWAMP 2008 QAPrP
- Contact SWAMP QA Help Desk
State Board SWAMP Website

[Image of SWAMP Website interface]

- **Welcome!**
- **About**
- **Tools**
- **Reports**
- **Contacts**
- **Links**

**SWAMP Resources**
- Home
- About
- Tools
- Reports
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**SWAMP**
- Surface Water Ambient Monitoring Program

**SOUND SCIENCE FOR INFORMED WATER QUALITY MANAGEMENT**
- Monitoring & Assessment Plans
- Data Sources
- Compatibility
- Tool Development
- Quality Assurance

[Website link: www.waterboards.ca.gov/water_issues/programs/swamp/tools.shtml]
Step-by-step Process
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      - Identify parameter RL
        
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          - Identify reporting requirements

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* QA Program Plan Appendix A: Measurement Quality Objectives (Page 59)
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*QA Program Plan Appendix B: Sample Handling (Page 92)*
Identify the SWAMP Requirements

- Sample Handling
  - Preservation
  - Holding times

- MQOs
  - Go to table for Conventionals
  - Go to table Inorganics

- Contact SWAMP QA Help Desk

- Read the additional info. in introduction of Appendix A and in Section B5 of the QAPrP

- Don’t forget to also identify any method requirements that are more strict than SWAMP

Orthophosphate (total as P) in water
Appendices A-1 & B-1

Zinc (total and dissolved) in water
Appendices A-5 & B-6
Step-by-step Process
Part 1 Identify Requirements

- Identify if parameter is covered by SWAMP

  No
  - Identify method/other requirements for parameter
    - Identify parameter RL
    - Identify parameter RL
    - Supply requirements to lab & field crews

  Yes
  - Identify all SWAMP requirements for parameter
    - Identify reporting requirements
    - Identify parameter RL
Identify Method Requirements for Non-SWAMP parameters

- Methods
- Establish own for project
- Caffeine in water is not covered by SWAMP
- Consult with lab
- What have other organizations done
Step-by-step Process
Part 1 Identify Requirements

- Identify if parameter is covered by SWAMP

  No ➔
  - Identify method/other requirements for parameter
  ➔ Identify parameter RL

  Yes ➔
  - Identify all SWAMP requirements for parameter
  ➔ Identify reporting requirements ➔ Supply requirements to lab & field crews ➔ Identify parameter RL
Step-by-step Process
Part 1 Identify Requirements

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  - Identify method/other requirements for parameter

  Yes
  
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  - Identify reporting requirements

  - Identify parameter RL

  - Supply requirements to lab & field crews

  - Identify parameter RL
Step-by-step Process
Part 1 Identify Requirements

- Identify if parameter is covered by SWAMP
  - No
    - Identify method/other requirements for parameter
    - Identify parameter RL
    - Supply requirements to lab & field crews
  - Yes
    - Identify all SWAMP requirements for parameter
    - Identify reporting requirements
    - Identify parameter RL
Supply Parameter List to Lab

- List of analyte/matrix combinations to lab along with QC requirements

- Lab should be able to supply you with list of methods or SOPs and any modifications (in writing)

- Lab should supply you with their MDLs and RLs

- Lab should then identify if they will comply with all the project or SWAMP QC requirements
  - Does your project allow batch QC? Probably necessary if you have a small project.
Go to example document
Step-by-step Process
Part 2 Discuss Requirements & Establish MQOs

- Set up preliminary meetings w/lab & field crew
  - Determine if project needs a QAPP
  - Establish MQOs
  - Pick project lab & field crew

- Draft Contract
Go to example document
Step-by-step Process
Part 2 Discuss Requirements & Establish MQOs

- Set up preliminary meetings w/lab & field crew
- Determine if project needs a QAPP
- Establish MQOs
- Pick project lab & field crew
- Draft Contract
Determine if your project needs a QAPP

- Excellent tool for communication
- Scale of project
- Contractual requirement
- Parameters outside SWAMP
- Studies that do not rely on established methods
- Litigation potential

In our example we are not writing a QA Project Plan; all of our work is routine (established methods, mainly SWAMP parameters). We will have a short document that details the study design with references to the SWAMP QAPrP and relevant methods (e.g., caffeine 525.1).
Step-by-step Process
Part 2 Discuss Requirements & Establish MQOs

- Set up preliminary meetings w/lab & field crew
- Determine if project needs a QAPP
- Establish MQOs
- Pick project lab & field crew
- Draft Contract
Step-by-step Process
Part 3 Use Three Keys to Success

- Hold Project Kick-off Meeting
- Make necessary adjustments
- Hold Mid-project Meeting
- Make necessary adjustments

- Real-time QC
- Communication
- No surprises
Hold Project Kick-off Meeting

- Responsibility of PM to call meeting
- Responsibility of all parties to attend

All participants
- Project Manager
- Field Crew
- Lab Crew
- QA Officer
- Other (e.g., database personnel)

Agenda
- Communication, Real-time QC, No Surprises Policy
- Roles and Responsibilities – all listed above and review communication/real-time QC
- Potential Project Issues
- SWAMP QAPrP or Project-Specific QAPP
- Standard Operating Procedures
- Meeting Follow-up...
Go to example document
Step-by-step Process  
Part 3 Use Three Keys to Success

- Hold Project Kick-off Meeting
- Make necessary adjustments
- Hold Mid-project Meeting
- Make necessary adjustments

- Real-time QC
- Communication
- No surprises
Mid-Project Meeting

- Responsibility of Project Manager to call meeting
- Responsibility of all participants to attend
- All participants
  - Project Manager
  - Field Crew
  - Lab Crew
  - QA Officer
  - Other (e.g., database personnel)

- Agenda
  - Review what is working and what is not working
  - What have been the QC issues and how were they resolved
  - Where do we go from here?
Three Keys to Success

- Real-time QC
- Communication
- No surprises

No Surprises

QC issue  Real-time communication  Project Manager
Outcome

- How to identify relevant SWAMP QA requirements
  - Look in SWAMP 2008 QAPrP
  - Call SWAMP QA Help Desk

- Which QA requirements need to be communicated to the contractor
  - Everything!

- Methods for ensuring the requirements are understood and followed
  - Contracts
  - Meetings
  - QA Documents

- How to work with a laboratory over the duration of a project
  - Do your homework in choosing lab, expect excellent customer service
  - Set up a “no surprises” work policy

- How to work through problems with a laboratory
  - Communication
  - If projected planned properly, issues should be seen as opportunities to enhance project
The QA Research Group at Moss Landing Marine Laboratories

Specializing in the Quality Assurance associated with all areas of environmental science such as in-stream flow, bioassessment, P-Hab, chemistry (including ultra-trace and speciation), toxicity testing, statistical analysis, field measurements, and database structures. If you would like to contract with the QA Research Group, please contact Beverly H. van Buuren.