Understanding and Implementing SWAMP Comparability:
Quality Assurance

SWAMP Quality Assurance Help Desk

swampqa@mlml.calstate.edu

Quality Assurance Research Group

Moss Landing Marine Laboratories

Moss Landing, California

California Water Boards

SWAMP Surface Water Ambient Monitoring Program

State Board Webinar Schedule

- ✓ SWAMP Comparability: Overview*
  - June 25, 2009: 11-12 (Valerie Connor)
- ❑ SWAMP Comparability: Quality Assurance
  - July 2, 2009: 11-12 (Quality Assurance Help Desk)
- ❑ SWAMP Comparability: Data Management
  - July 23, 2009: 11-12 (Data Management Help Desk)

* Slides will be posted

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Introduction

- SWAMP Comparability
- *The Surface Water Ambient Monitoring Program Quality Assurance Program Plan* (SWAMP QA Plan)
- Measurement Quality Objectives (MQOs)
- Holding Times
- Quality Assurance Project Plan (QAPP) Tools
- Resources

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SWAMP Comparability: FAQ

- How is SWAMP comparability defined?
- Where do I find the two documents that are the basis for SWAMP comparability?
- Are there any tools devoted to SWAMP comparability?

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SWAMP Comparability: Definition

- Adherence to two SWAMP documents:
  - ✓ *Surface Water Ambient Monitoring Program Quality Assurance Program Plan* (SWAMP QA Plan)
  - ❑ *The Surface Water Ambient Monitoring Program Database Management Plan**

* Webinar: Thursday, July 23rd

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SWAMP Comparability: Tools

- SWAMP Help Desk
  - Specializing in QA and data management
- SWAMP Comparability Fact Sheet
  - Next slides…

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SWAMP Comparability: Help Desk

- Phone: (206) 525-05491
- Email: swampqa@mlml.calstate.edu
- Services:
  - Directs users to appropriate tools, resources, or contact information
  - Clarifies SWAMP's QA requirements
  - Advises QAPP creation

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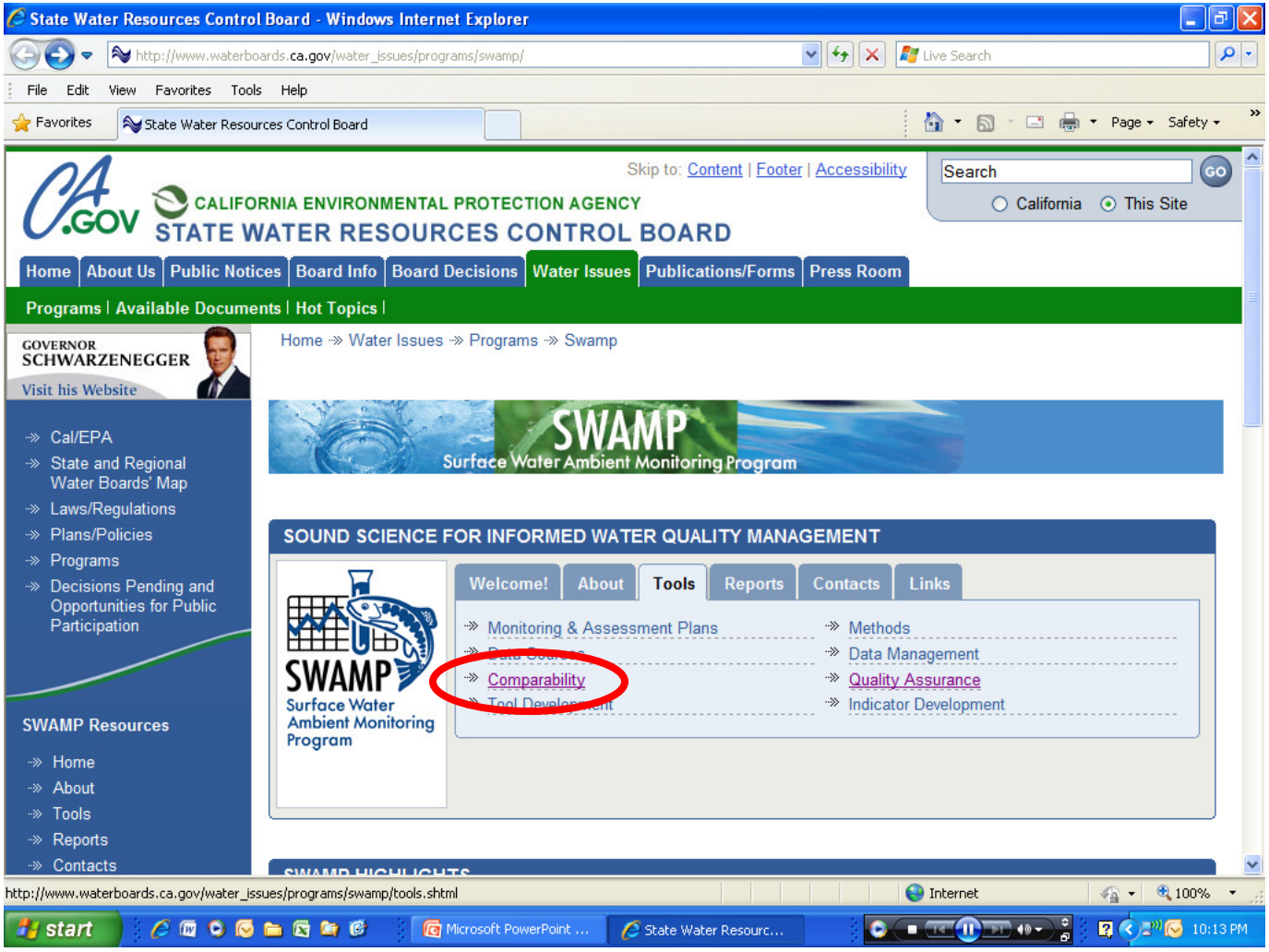
SWAMP Comparability: Website Step #1

http://www.waterboards.ca.gov/water_issues/programs/swamp/



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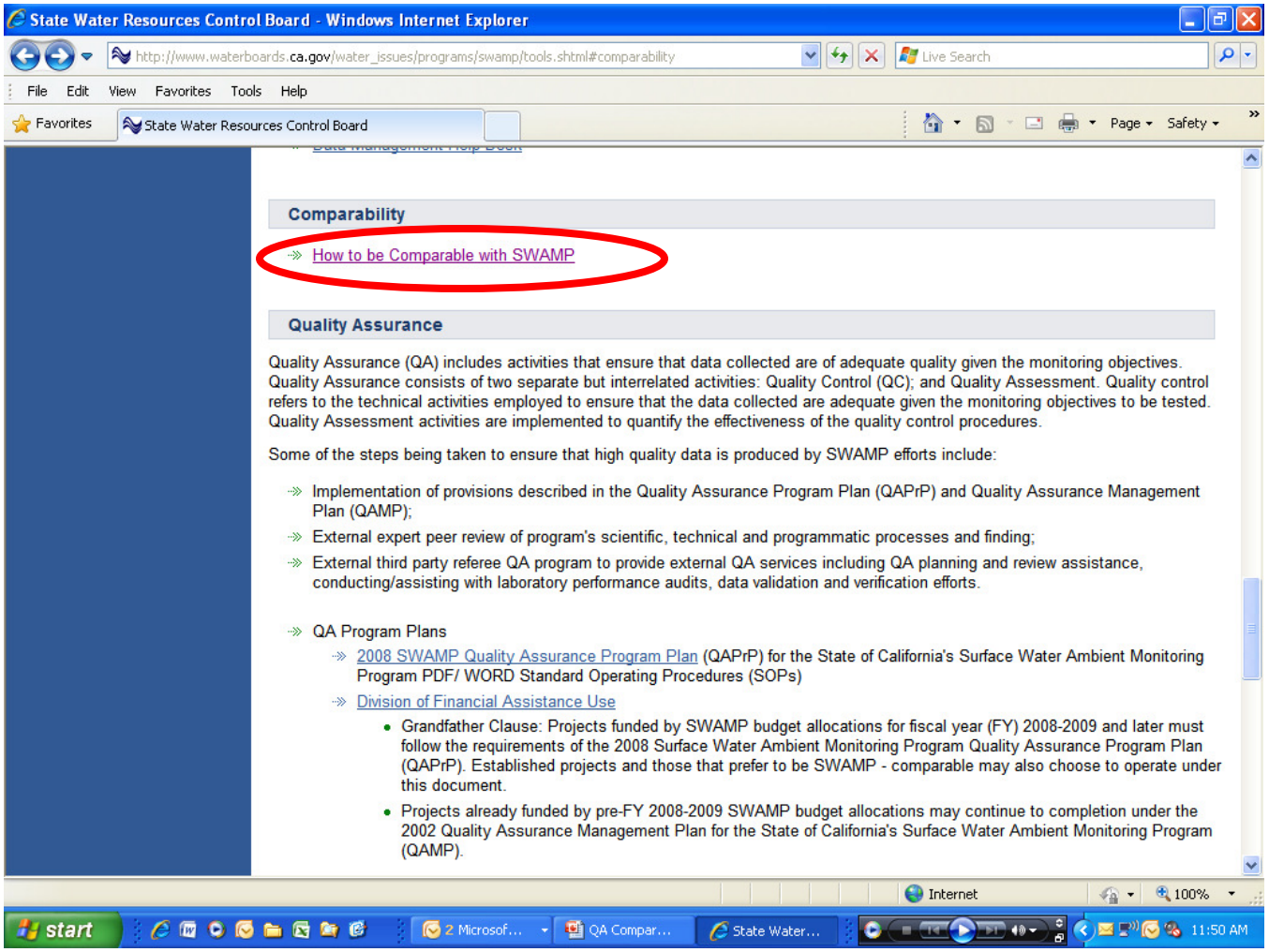
SWAMP Comparability: Website Step #2



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SWAMP Comparability: Website Step #3

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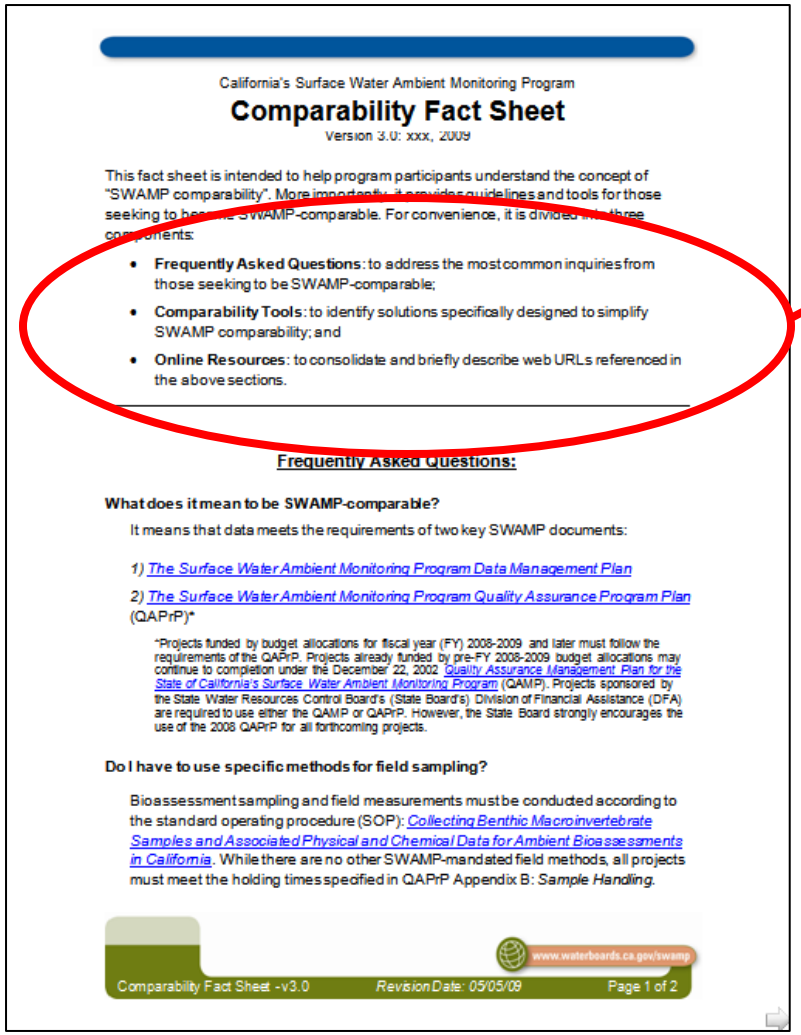
SWAMP Comparability: Website Step #4



California's Surface Water Ambient Monitoring Program

Comparability Fact Sheet

Version 3.0: xxx, 2009

This fact sheet is intended to help program participants understand the concept of "SWAMP comparability". More importantly, it provides guidelines and tools for those seeking to become SWAMP-comparable. For convenience, it is divided into three components:

- **Frequently Asked Questions**: to address the most common inquiries from those seeking to be SWAMP-comparable;
- **Comparability Tools**: to identify solutions specifically designed to simplify SWAMP comparability; and
- **Online Resources**: to consolidate and briefly describe web URLs referenced in the above sections.

Frequently Asked Questions:

What does it mean to be SWAMP-comparable?

It means that data meets the requirements of two key SWAMP documents:

1) *The Surface Water Ambient Monitoring Program Data Management Plan*

2) *The Surface Water Ambient Monitoring Program Quality Assurance Program Plan* (QAPrP)*

*Projects funded by budget allocations for fiscal year (FY) 2008-2009 and later must follow the requirements of the QAPrP. Projects already funded by pre-FY 2008-2009 budget allocations may continue to completion under the December 22, 2002 *Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program* (QAMP). Projects sponsored by the State Water Resources Control Board's (State Board's) Division of Financial Assistance (DFA) are required to use either the QAMP or QAPrP. However, the State Board strongly encourages the use of the 2008 QAPrP for all forthcoming projects.

Do I have to use specific methods for field sampling?

Bioassessment sampling and field measurements must be conducted according to the standard operating procedure (SOP): *Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California*. While there are no other SWAMP-mandated field methods, all projects must meet the holding times specified in QAPrP Appendix B: *Sample Handling*.

www.waterboards.ca.gov/swamp

Comparability Fact Sheet -v3.0 *Revision Date: 05/05/09* Page 1 of 2

- Frequently Asked Questions
- Comparability Tools
- Online Resources

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SWAMP QA Program Plan: FAQ

- Where do I find the QAPrP?
- What if my project can't meet all the requirements of the QAPrP?
- What if my project involves a parameter that isn't included in the QAPrP?
- How will I know if the QAPrP gets updated?

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SWAMP QA Program Plan: Recommendations vs. Requirements

- Requirements:
  - MQOs (SWAMP QA Plan Appendix A)
  - Holding Times (SWAMP QA Plan Appendix B)
  - Bioassessment/PHAB SOP: *Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California*
- Other Content:
  - Recommendations
  - Guidance
  - Resources

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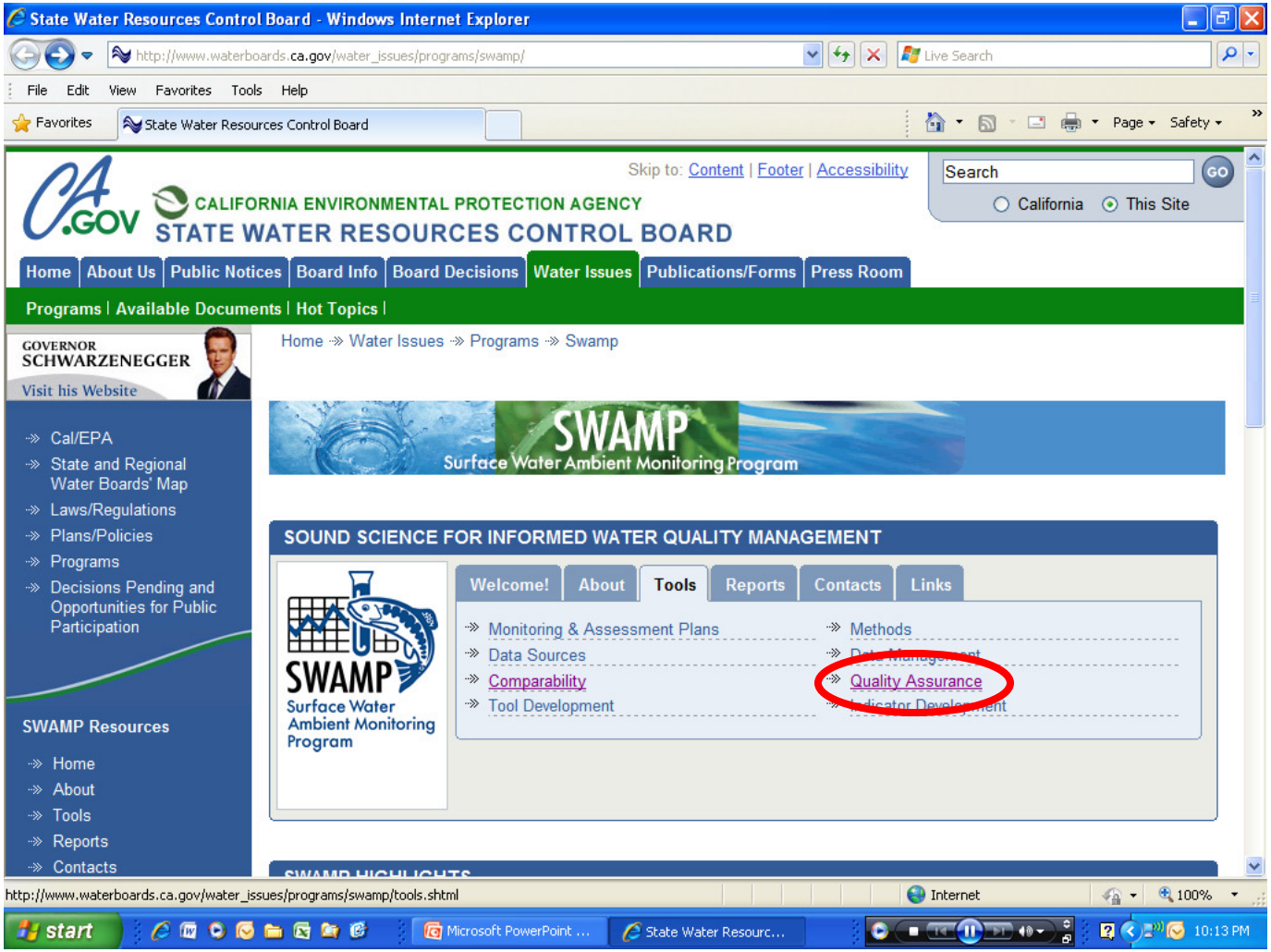
SWAMP QA Program Plan: Website Step #1

http://www.waterboards.ca.gov/water_issues/programs/swamp/



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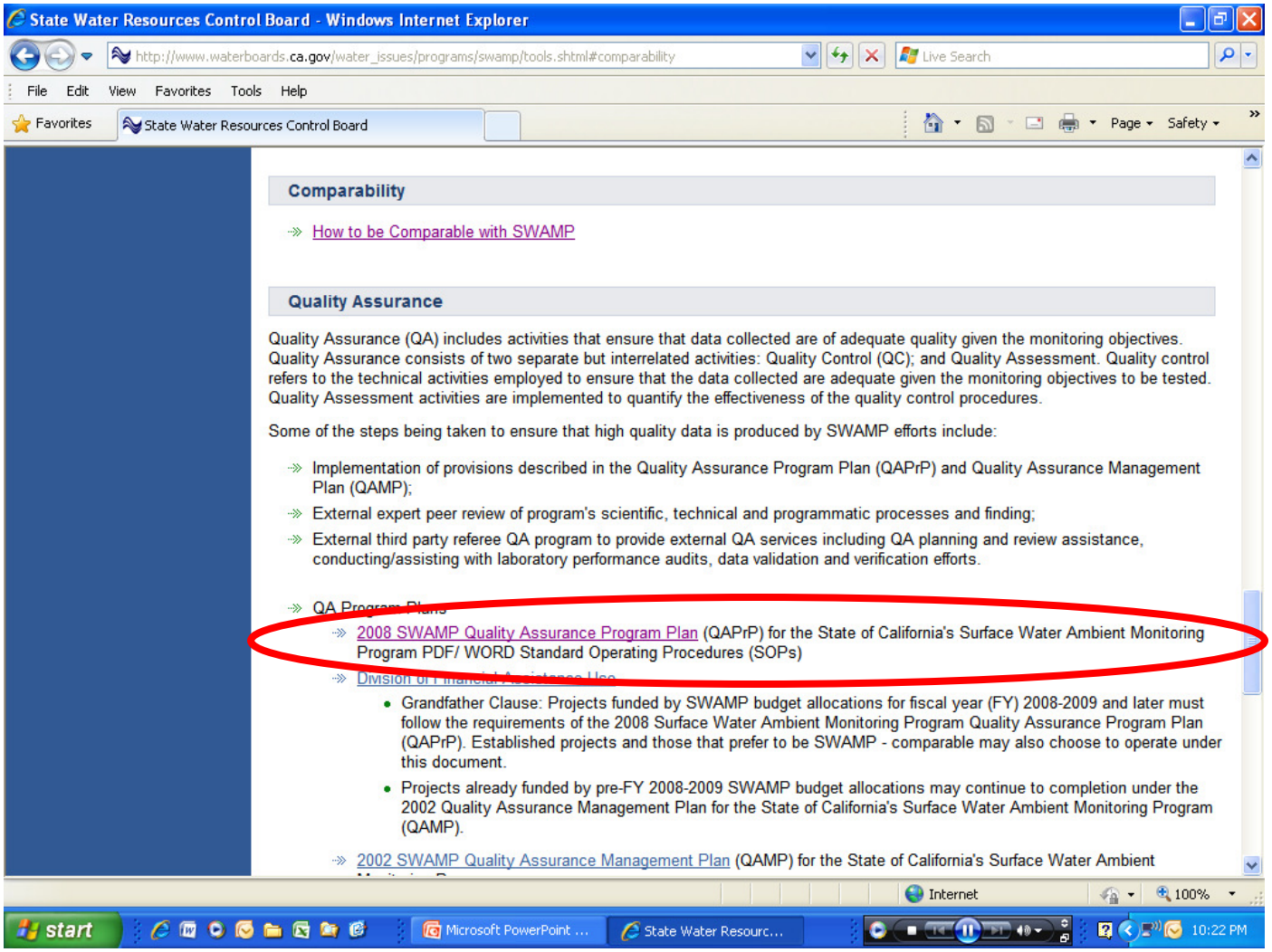
SWAMP QA Program Plan: Website Step #2



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Measurement Quality Objectives: FAQ

- Do I have to use specific methods for field sampling, field analysis, or laboratory analysis?
- What are MQOs?
- Are there SWAMP MQOs for all parameters?
- How were SWAMP MQOs established?

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Measurement Quality Objectives: Methods

- *Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California* **REQUIRED**

- *MPSL-DFG SOP for Conducting Field Measurements and Field Collections of Water and Bed Sediment Samples in the Surface Water Ambient Monitoring Program* **FOR REFERENCE**
- *SWAMP Field Methods Course* **FOR REFERENCE**

- National Environmental Methods Index (NEMI)
  - www.nemi.org

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Measurement Quality Objectives: Overview

- EPA Definition:
  - The individual performance or acceptance goals for precision, accuracy, representativeness, comparability, completeness, sensitivity
- SWAMP MQOs:
  - Coverage of multiple matrices
  - Field, conventional, and chemical analyses; toxicity testing
- SWAMP MQO Creation:
  - SWAMP QA Management Plan (2002)
  - Established methods
  - Expert focus groups
  - Repeated feedback

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Measurement Quality Objectives: Quality Control Samples

Indicator	Quality Control
Precision	Laboratory Duplicates, Matrix Spike Duplicates, Field Duplicates
Accuracy	Reference Materials, Matrix Spikes, Matrix Spike Duplicates, Continuing Calibration Verification Standards
Representativeness	Data Quality Assessment
Comparability	Proficiency Tests/Intercomparisons
Completeness	Data Verification
Sensitivity	Detection Studies, Instrument Calibration

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Measurement Quality Objectives: SWAMP Examples

Laboratory Quality Control	Frequency of Analysis	Measurement Quality Objective
Calibration Standard	Per analytical method or manufacturer's specifications	Per analytical method or manufacturer's specifications
Continuing Calibration Verification	Per 10 analytical runs	80-120% recovery
Laboratory Blank	Per 20 samples or per analytical batch, whichever is more frequent	<RL for target analyte
Reference Material	Per 20 samples or per analytical batch, whichever is more frequent	80-120% recovery
Matrix Spike	Per 20 samples or per analytical batch, whichever is more frequent	80-120% recovery
Matrix Spike Duplicate	Per 20 samples or per analytical batch, whichever is more frequent (chlorophyll: n/a)	80-120% recovery RPD<25% for duplicates
Laboratory Duplicate	Per 20 samples or per analytical batch, whichever is more frequent (chlorophyll: per method)	RPD<25% (n/a if native concentration of either sample<RL)
Internal Standard	Accompanying every analytical run as method appropriate	Per method
Field Quality Control	**Frequency of Analysis**	**Measurement Quality Objective**
Field Duplicate	5% of total project sample count	RPD<25% (n/a if native concentration of either sample<RL)
Field Blank, Travel Blank, Equipment Blank	Per method	<RL for target analyte

QA Program Plan Appendix A: Measurement Quality Objectives (Page 59)

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Measurement Quality Objectives: Method Conflicts

Laboratory Quality Control	Frequency of Analysis	Measurement Quality Objective
Calibration Standard	Per analytical method or manufacturer's specifications	Per analytical method or manufacturer's specifications
Continuing Calibration Verification	Per 10 analytical runs	80-120% recovery
Laboratory Blank	Per 20 samples or per analytical batch, whichever is more frequent	<RL for target analyte
Reference Material	Per 20 samples or per analytical batch, whichever is more frequent	80-120% recovery
Matrix Spike	Per 20 samples or per analytical batch, whichever is more frequent	80-120% recovery
Matrix Spike Duplicate	Per 20 samples or per analytical batch, whichever is more frequent (chlorophyll: n/a)	80-120% recovery RPD<25% for duplicates
Laboratory Duplicate	Per 20 samples or per analytical batch, whichever is more frequent (chlorophyll: per method)	RPD<25% (n/a if native concentration of either sample<RL)
Internal Standard	Accompanying every analytical run as method appropriate	Per method
Field Quality Control	**Frequency of Analysis**	**Measurement Quality Objective**
Field Duplicate	5% of total project sample count	RPD<25% (n/a if native concentration of either sample<RL)
Field Blank, Travel Blank, Equipment Blank	Per method	<RL for target analyte

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Holding Times

Analyte	Units	Recommended Container	Recommended Sample Volume	Recommended Preservation	Required Holding Time
Sulfate	mg/L	Polyethylene Bottles	300 mL	Cool to 6 °C and store in the dark	28 days
Sodium	mg/L	Polyethylene Bottles Glass or plastic filtering apparatus are recommended to avoid possible contamination.	600 mL	Acidify with (1+1) HNO_3 to pH <2.	6 months
Turbidity	NTU	Polyethylene Bottles	300 mL	Cool to 6 °C and store in the dark	48 hours

QA Program Plan Appendix B: Sample Handling (Page 92)

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Quality Assurance Project Plan Tools

- SWAMP Advisor
  - http://swamp.waterboards.ca.gov/swamp/qapp_advisor/
- SWAMP QAPP Template
  - http://swamp.mpsl.mlml.calstate.edu/resources-and-downloads/quality-assurance/quality-assurance-project-plan-guidance/#QAPPTemplate
- SWAMP QAPP Review Checklist
  - http://swamp.mpsl.mlml.calstate.edu/resources-and-downloads/quality-assurance/quality-assurance-project-plan-guidance/#QAPPChecklist
- SWAMP Help Desk
  - http://swamp.mpsl.mlml.calstate.edu/swamp-comparability/help-desk

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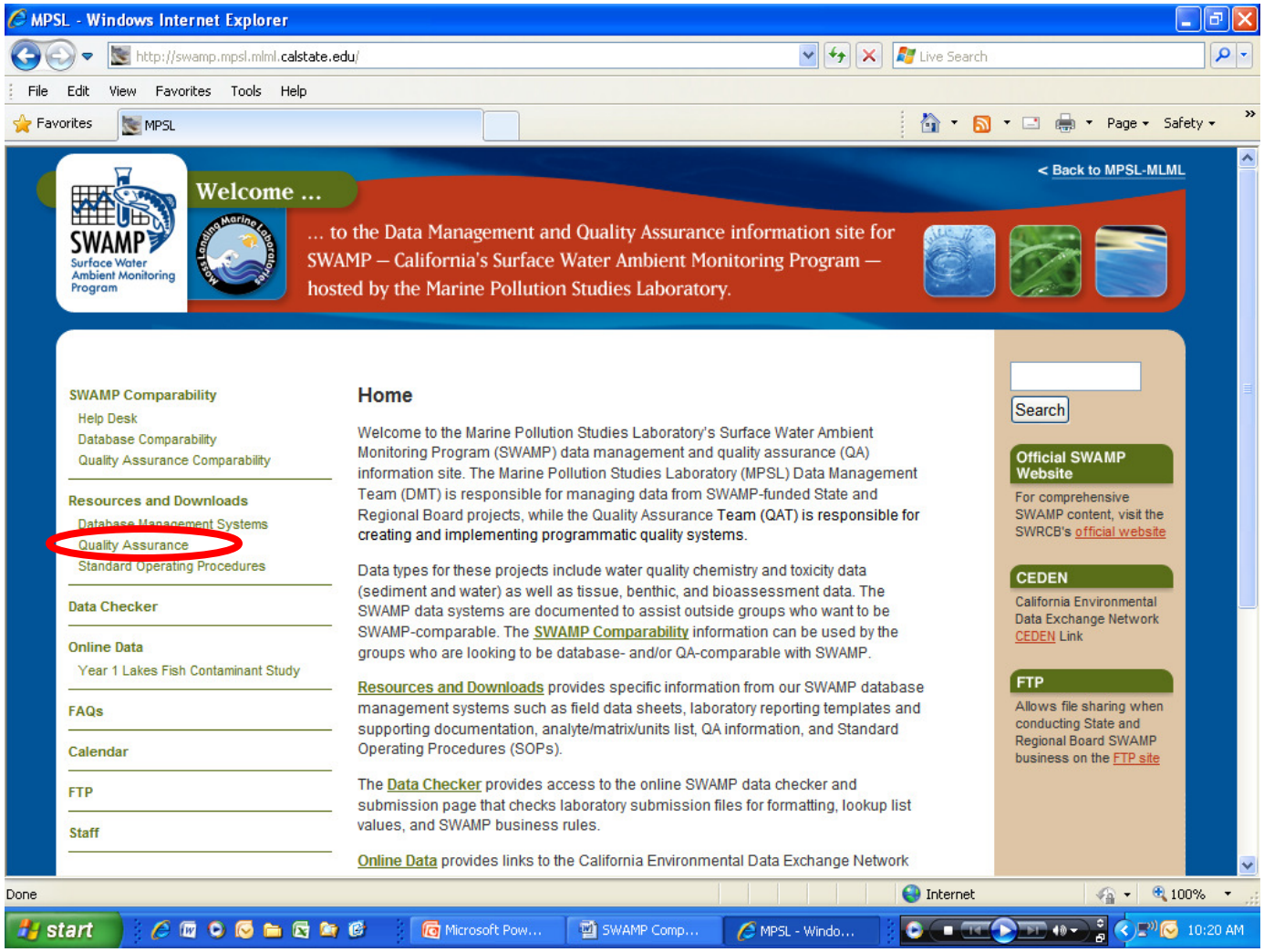
SWAMP QAPP Tools: Website Step #1

http://swamp.mpsl.mlml.calstate.edu/



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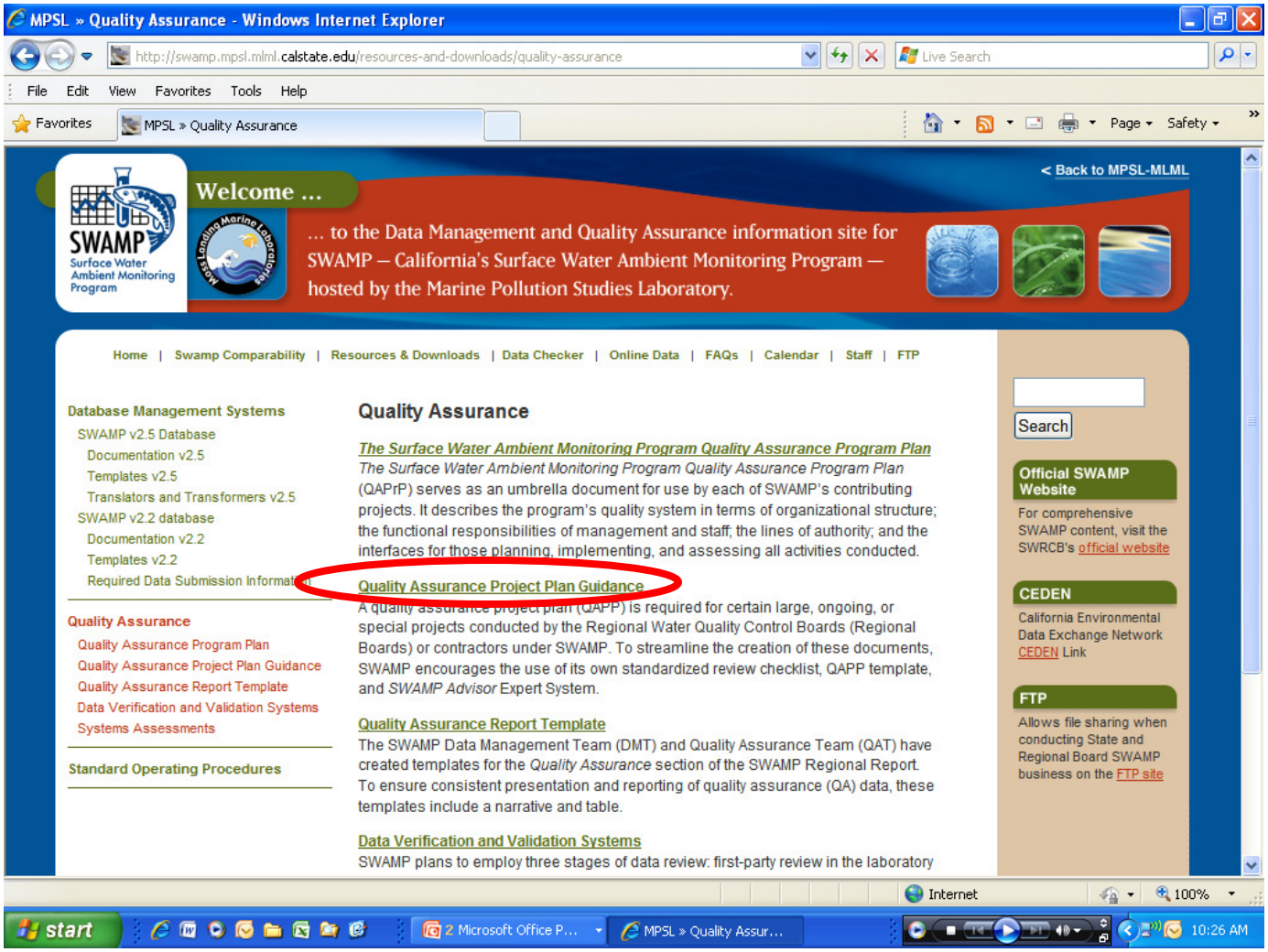
SWAMP QAPP Tools: Website Step #2



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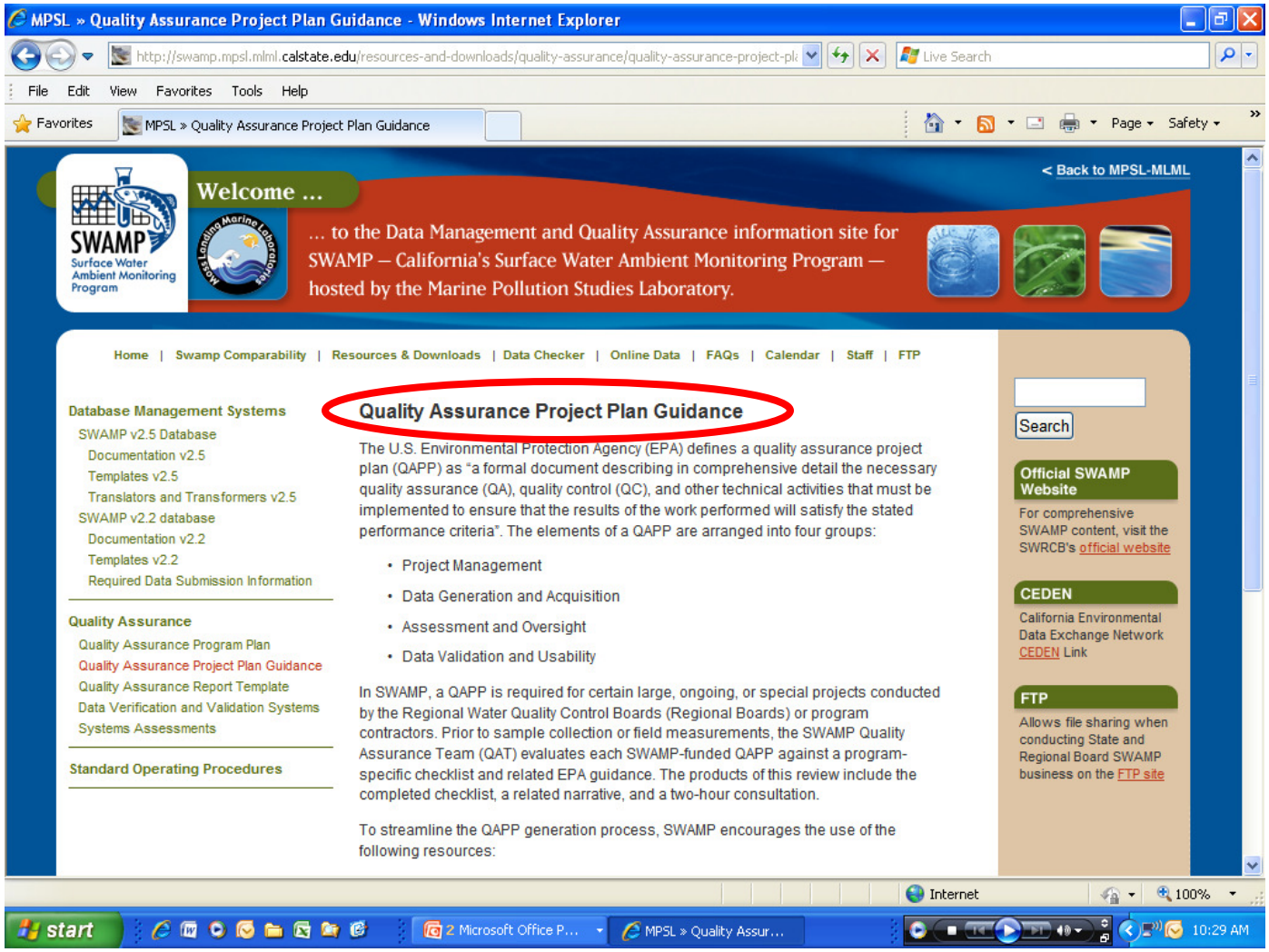
SWAMP QAPP Tools: Website Step #3



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SWAMP QAPP Tools: SWAMP Advisor

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Implementing Comparability: Initial Steps

- Identify project participants – don't forget QA
- Review SWAMP QAPrP
- Contact HD with questions
- Hold QA kickoff meetings
- Create QAPP (if needed)

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Implementing Comparability: Ongoing Steps

- Conduct laboratory and field assessments to evaluate adherence to SWAMP comparability
- Maintain lines of communication
- Attend SWAMP QA trainings
- Subscribe to Lyris email list
- Call SWAMP Help Desk

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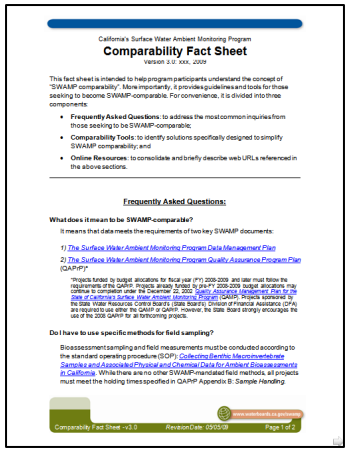
Summary

- Adhere to the SWAMP QA Program Plan. Specifically:
  - MQOs (Appendix A)
  - Holding times (Appendix B)
  - Bioassessment/PHAB SOP
- Utilize the Help Desk and SWAMP Comparability Fact Sheet



California's Surface Water Ambient Monitoring Program

Comparability Fact Sheet

Version 2.0, XXX, 2009

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Comparability Fact Sheet - v3.0 Revision Date: 03/03/09 Page 1 of 2

- Frequently Asked Questions
- Comparability Tools
- Online Resources

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swampqa@mlml.calstate.edu

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