

# Surface Water Ambient Monitoring Program Quality Assurance Program Memorandum

(Approved by the Interim SWAMP Coordinator)

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**To:** SWAMP Round Table

**From:** Beverly H. van Buuren, SWAMP Quality Assurance Officer and  
Peter R. Ode, SWAMP Bioassessment Coordinator

**Date:** May 21, 2007

**Re:** SWAMP Standard Operating Procedure (SOP) and Interim Guidance on  
Quality Assurance for SWAMP Bioassessments

The bioassessment section of the current *SWAMP Quality Assurance Management Plan* (SWAMP QAMP, 2002) is significantly outdated. The SWAMP Quality Assurance Officer and SWAMP Bioassessment Coordinator are currently developing the framework for a comprehensive SWAMP Bioassessment QA Oversight Program that will specify quality assurance requirements for the many components of bioassessment and physical habitat procedures. Until that program is in place, this memo serves as interim guidance defining quality assurance requirements for several key elements of SWAMP's Bioassessment Program. All SWAMP-funded bioassessment projects are subject to the requirements listed in this memo, which are effective May 21, 2007.

If you have any questions regarding this guidance, please contact the SWAMP QA Officer, Beverly H. van Buuren at (206) 297-1378, or via email at [bvanbuuren@mlml.calstate.edu](mailto:bvanbuuren@mlml.calstate.edu) or the SWAMP Bioassessment Coordinator, Peter Ode, at (916) 358-0316, or via email at [pode@ospr.dfg.ca.gov](mailto:pode@ospr.dfg.ca.gov).

## **New Field Protocols**

**All SWAMP-funded bioassessment studies shall follow the new field protocols (February 2007).** The new field protocols were developed after completion of two method comparison studies (Ode et al. 2005, Herbst and Silldorff 2006), and received independent peer review by experts in the fields of bioassessment and habitat assessment.

The standard operating procedure (SOP), *Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California*, was finalized and released in February 2007. An announcement of the document's availability was distributed by SWAMP's lysis list-serve in April of 2007. The SOP stipulates official procedures for the collection of bioassessment samples and associated physical habitat data. It outlines the process for sampling benthic macroinvertebrate assemblages and describes a suite of measures for sampling associated physical habitat and chemical conditions. The document is available for download on the SWAMP website ([www.waterboards.ca.gov/swamp/reports.html](http://www.waterboards.ca.gov/swamp/reports.html)).

## **Macroinvertebrate Sample Collection**

**All SWAMP-funded bioassessments shall follow the implementation guidance on Page 4 of the February 2007 field protocols to collect two samples (i.e., targeted-riffle composite and**

**reachwide benthos composite) under most circumstances.**<sup>1</sup> SWAMP's bioassessment program was first peer-reviewed from 2001 to 2003. The final peer review report (January 2003) is on the SWAMP website at: <http://www.swrcb.ca.gov/swamp/biocalstreams.html>. The peer reviewers recommended that targeted riffle samples continue to be collected and that a multihabitat feature also be added to the Water Boards' bioassessment program unless and until sufficient data are available to justify collecting only one sample. This interim guidance to collect two samples was: (1) vetted through the SWAMP Bioassessment Committee in 2003-04; (2) approved via consensus at the full SWAMP Roundtable meeting in January 2005; and (3) included (on Page 4) of the new protocols in February 2007. While much new data is available, there is not yet consensus in the scientific community to support a decision to drop one of these samples. Therefore, this guidance shall remain in effect until the program makes a considered decision to change it.

## **Site Replication**

**All SWAMP-funded bioassessments shall include 10% site replication.** SWAMP's bioassessment program was first peer-reviewed from 2001 to 2003. The final peer review report (January 2003) is on the SWAMP website at: <http://www.swrcb.ca.gov/swamp/biocalstreams.html>. The peer reviewers (Section 5.2, Page 47) concluded: *"We recommend that replication be continued in California bioassessments for the purpose of precision estimates...At a minimum, 10% of collections should be replicated."* The SWAMP Bioassessment Committee decided via consensus to incorporate this requirement into all quality assurance project plans (QAPPs) for SWAMP bioassessments (memorialized in a February 3, 2004 memorandum from Tom Suk, Chair, SWAMP Bioassessment Committee, to Dr. Valerie Connor, SWAMP Program Coordinator), and this requirement was discussed and approved at the full SWAMP Roundtable meetings in December 2004 and January 2005. Specifically, at 10% of sites, both the targeted-riffle composite and multihabitat methods shall be replicated to allow ongoing precision estimates over time.

## **Standard Taxonomic Effort**

**To ensure standardized reporting and to facilitate data comparability, all SWAMP-funded bioassessments are required to participate in the Southwest Association of Freshwater Invertebrate Taxonomists (SAFIT) and utilize the SAFIT Level II taxonomic effort (STE), unless the SWAMP Bioassessment Coordinator concurs in writing that deviation is necessary to meet program and project objectives.** SAFIT defines two standard levels of taxonomic effort for benthic macroinvertebrates. Level I generally specifies genus level identification for most insects (with midges to subfamily), whereas Level II specifies more precise taxonomic effort (generally species level ID where possible, with midges to genus). Requirement of Level II taxonomic effort has been discussed at several SWAMP Bioassessment Committee and full SWAMP Roundtable meetings. While there has been general agreement, this agreement has not previously been memorialized. The SWAMP Bioassessment Committee Chair (Tom Suk) and SWAMP Bioassessment Coordinator (Peter Ode) strongly recommend that this be a program requirement. Effective immediately, SAFIT Level II shall be the standard taxonomic effort for SWAMP, with exceptions granted as noted above. The SAFIT STE List can be found at the State Water Board's website: [http://www.swrcb.ca.gov/swamp/docs/safit/ste\\_list.pdf](http://www.swrcb.ca.gov/swamp/docs/safit/ste_list.pdf)

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<sup>1</sup> There are two exceptions to this requirement: First, it is acknowledged that riffle habitats do not exist in some low-gradient streams. Where sufficient riffle habitat does not exist to allow collection using the targeted-riffle composite (TRC) method, the TRC sample need not be collected. At such sites, the TRC sample may (but does not have to) be replaced with a Margin-Center-Margin sample, at the discretion of the project. Second, both samples shall be collected in all situations except as noted in the preceding sentence unless the SWAMP Bioassessment Coordinator (currently Peter Ode) documents in writing that deviation is necessary to meet program and project objectives.

## **External Taxonomic Quality Assurance Analyses**

**Effective immediately, all SWAMP-funded bioassessments shall include reidentification of a minimum of 10% of samples by an external quality assurance (QA) laboratory.<sup>2,3</sup>** All taxonomic samples subject to QA analysis must be archived with a minimum of one vial per final ID. Final ID vials must contain a taxonomic label and a date/locality label that includes the 9-character SWAMP site code). The originating laboratory shall provide the QA laboratory with a list of all samples collected for SWAMP, with the name of the taxonomist(s) who performed the organism identifications for each sample. The QA laboratory shall then select 10% of samples to be transported for QA analysis, making sure to evaluate samples from each taxonomist at the originating laboratory.<sup>4,5</sup> Further, the SWAMP QA Officer must approve the QA laboratory to be used for these checks. Deviations from this guidance may be approved with concurrence of the SWAMP Bioassessment Coordinator and the SWAMP QA Officer. This interim guidance is needed to ensure consistent application of QA practices, and to ensure that all laboratories performing taxonomic identifications for SWAMP are doing so to professional standards.

## **Index Period**

**All SWAMP-funded bioassessments shall include sampling during the most appropriate index period (i.e., time of year that samples are collected).** This interim guidance is needed to ensure data comparability by requiring that samples are collected during standardized index periods. Since the appropriate index period varies at different latitudes and elevations (southern latitudes are generally sampled in late spring and northern latitude sites are generally sampled in late summer), this guidance will vary with the project boundaries. If any disputes arise, the SWAMP Bioassessment Coordinator shall determine the most applicable index period for a given project.

## **Other Laboratory Methods**

**The minimum organism fixed-count per sample shall be 600.** Subsampling shall be performed using the grid-tray method described in the California Stream Bioassessment Procedures (Harrington 2003, [http://www.dfg.ca.gov/cabw/csbp\\_2003.pdf](http://www.dfg.ca.gov/cabw/csbp_2003.pdf) ) or an alternative method accepted as equivalent by the SWAMP Bioassessment Coordinator after completion of performance-based methods comparison(s). These subsampling standards are necessary to foster data comparability and the minimum sample count ensures large enough sample size to use current biological assessment tools.

## **Physical Habitat Measurements**

**SWAMP-funded bioassessments shall include the “Full” suite of physical habitat measurements detailed in the February 2007 protocols cited above,** unless the SWAMP Bioassessment Coordinator determines in writing that the “Full” suite of habitat measurements is not needed for a specific project in order to achieve project and program goals. The “Full” suite of habitat measurements is necessary in most cases to characterize habitat conditions and facilitate interpretation of the biological data at a level that will allow SWAMP to build effective tools for bioassessment and biocriteria. The application of consistent methods by all projects is also needed to foster data comparability.

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<sup>2</sup> If an applicable QAPP requires a higher percentage, the higher amount shall be used.

<sup>3</sup> Funding for this requirement is the responsibility of the project, not the analytical laboratory.

<sup>4</sup> “Sample” in this context means all identified taxa from a single method by location (i.e., “site” x “sample event” x “method”).

<sup>5</sup> Specific requirements for corrective action will be addressed in the forthcoming Bioassessment QA Oversight Plan

## **References**

Herbst, David B., and Erik L. Silldorff. 2006. Comparison of the Performance of Different Bioassessment Methods: Similar Evaluations of Biotic Integrity from Separate Programs and Procedures. *Journal of the North American Benthological Society* 25(2):513-530.

Ode, Peter R., Andrew C. Rehn, and Jason T. May. 2005. A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. *Environmental Management* 35(4):493-504.

Puckett, M. 2002. *Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program*; California Department of Fish and Game, Monterey, CA, 2002.