Introducing SWAMP Advisor

The SWAMP Advisor is an expert software tool operating as an expert reference system currently under development by Instant Reference Sources, Inc. in conjunction with California’s State Water Resources Control Board and the Quality Assurance Research Group at Moss Landing Marine Laboratories. The SWAMP Advisor’s interactive format compiles user input into a comprehensive quality assurance project plan (QAPP) that meets the requirements of California’s Surface Water Ambient Monitoring Program (SWAMP). Because it is suitable for such varied statewide uses, SWAMP Advisor is equally relevant to more universal monitoring applications nationwide. With the SWAMP Advisor, the user learns the rationale for requested input and gains direct access to supporting information and resources. All guidance is given with regard to real life constraints on budget, scheduling, personnel, and equipment. In this way, the system provides valuable tools that are useful not only in quality assurance project planning, but in the improvement of the project’s overall quality assurance (QA) program.

Data Quality Objectives and Measurement Quality Objectives

By virtue of particular project objectives, SWAMP Advisor guides the user through all 24 elements of QAPP creation, it emphasizes the importance of project-appropriate data quality objectives (DQOs).

Data Quality Objectives

- Quantifiable and verifiable statement of how the data will be used
- Measurable criteria for acceptance of data
- Contributions to information needs

Measurement Quality Objectives

- Accuracy criteria for the quality attributes measured by the project data quality objectives
- Precision criteria for the quality attributes measured by the project data quality objectives
- Compliance criteria for the quality attributes measured by the project data quality objectives

Projects that do not initially define these objectives are unable to assess the quality of their data. For this reason, DQOs are critical input not only for a project’s quality assurance project plan, but in its overall project plan.

By defining action limits, regulatory requirements, and procedures, QA systems such as detection limit and inter-

Step 4: Define the Boundaries of the Study

Before the SWAMP Advisor can begin creating a QAPP, the user must define the study’s functional boundaries. This is a critical step in the development of project action limits and resulting regulatory requirements. The user must define the study’s functional boundaries by establishing the following:

1. The geographic boundaries of the study area.
2. The temporal limitations of the study area.
3. The parameters to be measured in the study area.

Step 5: Develop a Decision Rule

In the fifth step, the SWAMP Advisor helps the user define the framework of project action limits. For example, mean, median, maximum associated with each target analyte. It also guides the user in the development of project action limits by suggesting risk management strategies or other potential rules for determining project action limits.

Step 6: Specify Tolerable Limits on Decision Errors

The SWAMP Advisor helps the user define the framework of project action limits by suggesting risk management strategies or other potential rules for determining project action limits. It is crucial that the design project’s risk management strategy be independent from other groups at MLML and Instant Reference Sources, Inc. and be independent from the technical nature of this step.

In effect, these steps help define the project’s budget for sample handling and analysis. Of course, this budget effects, and is affected by, the cost of the underlying QA program. It is crucial that the project does not consider QA as a luxury, but as an essential component of project design. In doing so, it prevents the unnecessary expenditure of funds by sampling less and analyzing more that is not scientifically defensible.

Conclusion

To-date, the SWAMP Advisor has been developed to address the first 12 EPA quality assurance project plan elements. The remaining 12 elements are scheduled for completion within the 2001-2003 timeframe. The SWAMP Advisor is being tested and improved using town groups comprised of QAPP creators and users. In addition, the use of technical advisors that assure the software’s specialized scientific content remain complete and current. The SWAMP Advisor’s technical and user interface are prioritized in order to advance its advantages over the status of usability.

Instant Reference Sources, Inc.

Dr. Lawrence H. Kain is president of Instant Reference Sources, Inc. and has 40 years of experience in environmental chemistry. He has worked for U.S. EPA and Richardson and has taught environmental QA/QC courses in Asia, Australia, Europe and South America, as well as throughout the United States and Canada. He is currently developing expert systems for the U.S. EPA Water Security Division and California’s State Water Resources Control Board and is also involved in the creation and maintenance of the National Environmental Methods Index.

The Quality Assurance Research Group at Moss Landing Marine Laboratories

The Quality Assurance (QA) Research Group is based out of Moss Landing Marine Laboratories (MLML) through the support of the State of California. Our group is independent from other groups at MLML and is responsible for the development and distribution of quality assurance/quality control management for projects at MLML. The QA Research Group consists of five full-time staff members working at various levels on several projects. They are involved in quality management for state and national programs, including geographic sampling, electronic data capture, and software development. The group’s members are currently involved in two large-scale programs: the State of California’s Water Ambient Monitoring Program and the GRAD/CAIR/California R. Estuaries Authority Marine Program. Each project requires a continuous and challenging set of QA responsibilities.

The group is also involved in a variety of smaller projects, including research in area such as sampling issues and preservation techniques.

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