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Section B4. Analytical Methods Requirements

The SWRCB contracts for SWAMP Program laboratory services for itself, as well as for all of the Regional Water Quality Control Boards, through utilization of the central contracting office at the SWRCB. The SWRCB currently utilizes two "master contracts" for providing analytical, field, technical/scientific consulting, and other assistance to the SWRCB and any/all RWQCB's desiring to utilize these master contracts. Currently, the two master contracts are with: 1) California Department of Fish and Game (DFG); and 2) U.S. Geological Survey (USGS). In addition, RWQCB's may negotiate and establish contracts for SWAMP services with any number of other qualified agencies, organizations, or commercial laboratories through the SWRCB central contracting office. The Organization Charts provided earlier in the QAMP (Figures 2, 3, 4, and 5), as well as in **Appendix A**, outline these relationships and contracts in more detail.

All contract laboratories must document the methods they use, the SOPs, and the data acceptability criteria of their analytical capabilities in their QA Program Plan and QA Manual respectively, also. The laboratory analytical procedures used by particular SWAMP laboratories are on file with the respective laboratory, and the acceptability criteria within which analytical procedures must be performed within are outlined in **Appendix C**.

The laboratory supervisor of each contracted lab has primary responsibility for responding to a failure of analytical systems. Solutions which are consistent with the measurement objectives will be reached in consultation with the project manager.

The method numbers used by each contract laboratory for each analytical procedure they perform for SWAMP is available in each laboratory=s respective QA Plan on file with that laboratory.

Corrective Action for Laboratory Activities:
Failures in field and laboratory measurement systems involve, but are not limited to such things as, instrument malfunctions, failures in calibration, sample jar breakage, blank contamination, quality control samples outside of the defined limits (Data Acceptability Criteria) listed in **Appendix C**. In many cases, the field technician or lab analyst will be able to correct the problem. If the problem is resolvable by the field technician or lab analyst, then they will document the problem in their field notes or laboratory record and complete the analysis. If the problem is not resolvable, then it is conveyed to the respective supervisor, who will make the determination if the analytical system failure compromised the sample results and should not be reported.   The nature and disposition of the problem is documented in the data report that is sent to the SWAMP Project Manager.

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Detection limits may be affected by instrument sensitivity or by bias due to contamination or matrix interferences. Common laboratory practice is to adjust detection limits upward in cases where high instrument precision (i.e., low variability) results in calculated detection limits that are lower than the absolute sensitivity of the analytical instrument. In these cases, best professional judgment is used to adjust detection limits upward to reduce false positives and values below the detection limit are not reported. In all cases, results cannot be reported for values less than the Method Detection Limit (MDL--see definitions below).

For SWAMP, the recommended applications of detection and quantification limits should follow:
   ❖ Values below the Method Detection Limit (MDL, per 40 CFR Part 136) are to be reported as a negative ("-") sign followed by the actual MDL value, and flagged with an ND = not detected.
   ❖ Values between the MDL and the Reporting Limit (RL, aka quantification limit, which is the MDL multiplied by a factor of 1-10, as determined by the lab to provide acceptable precision values among replicated measurements) should be reported as the actual measured value (not negative), with a flag that is carried all the way through data storage, handling, and reporting. The flag is DNQ = detected, not quantifiable.
   ❖ Values above the RL (or quantification limit) are deemed as acceptable values without reservation, and are shown as the actual measured value, and assigned a QA code of A (Acceptable without reservation).
   ❖ Other QA qualification codes may occur if QC criteria are not met or qualification is deemed appropriate during subsequent QA review.

The SWAMP Program has had numerous planning discussions and workshops regarding a variety of technical and scientific issues. One of the topics that led to lengthy and useful discussions was on the use and designation of Method Detection Limits, Minimum Detection Limits, Method Quantification Limits, Target Reporting Limits, and other such terminology used to apply to chemical concentration analytical quantification limits. Discussions centered on methodology limitations, matrix or other interference limitations, "cleanup" limitations, dilution limitations, and most important, discussions regarding the specific objectives for which the respective analyses are being conducted illuminated the large variety of regional goals and objectives for the current SWAMP work being conducted. At this time, RWQCB priorities and objectives for monitoring needs within their respective regions will drive the analytical needs of the program, and will therefore drive the data quality objectives for SWAMP. Therefore, there is a need and rationale for flexibility in analytical techniques, reporting limits, even sample collection protocols as properly driven at this point by RWQCB SWAMP Work Plan objectives.

To make recommendations, and in fact to make requirements for the reporting limits for chemical analyses for a program such as the California SWAMP Program, as it currently exists in its start-up phase, is very complex and difficult, given the issues pointed out above. This is due in large part to the variety of different objectives (including Basin Plan objectives) each RWQCB has in their

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current Work Plans, as well as the variety of resulting experimental designs in different regions, the variety of differing media being collected in different regions, and the variety of differing analyses being conducted in different regions.

As with all other aspects of this SWAMP QAMP, therefore, the intent is to provide for minimum standards and guidelines that all participants should utilize, with strong encouragement to use more stringent criteria and to adopt methodologies that improve upon these minimum standards. The major goal that this SWAMP QAMP can accomplish, if all SWAMP participants abide by the stipulations put forth in this document, is to have representative, comparable, accurate and precise data that can be shared statewide, to the extent possible under the given limitations.

Given the issues stated above, it is the intent to provide guidance for <u>recommended</u> **Target Reporting Limits (TRL's) for SWAMP** analytical procedures. Target Reporting Limit Tables for SWAMP are provided in **Appendix C**, for all analytical groups in all media. These are "recommended" reporting limits at this time, and participating laboratories will provide their actual MDL's and RL's, as described above, in the submission of their data.

In general, laboratories should strive to meet target reporting limit recommendations for undetected analytes. In those cases where high concentrations of some analytes require analysis of a diluted sample and the dilution results in non-detects for other analytes, analysis of the sample at several different dilutions may be required to meet program detection limits as fully as practical.

When using the SWAMP Target Reporting Limits, it is clear that if any SWAMP entity desires to use analytical reporting limits that are more stringent than those in this SWAMP QAMP, this is highly encouraged. However, if any SWAMP entity desires to use analytical reporting limits that are LESS stringent than those within this SWAMP QAMP, then documentation of the rationale for such a variation, as well as any methodological variance, should be provided in writing.