

7 QUALITY CONTROL PROCEDURES

7.1 QUALITY CONTROL CHECKS

The Laboratory QA Manager is responsible for planning, scheduling, and coordinating evaluations of the internal QC checks in accordance with approved laboratory procedures. The Laboratory QA Manager will be able to provide, upon request, to the QC Manager a satisfactory evaluation of the following:

- Possession and use of the latest approved Laboratory QA Plan, SOPs, standards and/or project specific instruction(s);
- Conformance with appropriate plans, procedures, standards, and instructions;
- Thoroughness of the performance;
- Identification and completeness of documentation generated during performance, including:
 - Project number and/or name
 - Task description
 - Name of performer
 - Date(s) of performance
 - Page number and total number of pages, if more than one sheet
 - Consideration of all blank titled spaces on forms
 - Legible and reproducible presentation
 - Reasonable data entries, calculations, and results
 - Precise plots, charts, data summaries, graphs, and clearly defined parameters
 - Proper approval, transcription, and reference of input data
- Analysis of performance evaluation (QA/QC) samples as appropriate.

7.2 ACCEPTABLE CRITERIA

The following acceptance criteria will be considered if pertinent to the specific activity:

- Appropriate forms, logs, or formats have been used;
- Equipment has been referenced and calibrated as required; and
- Equipment meets specifications.

Other acceptance criteria will be incorporated into the technical procedures that describe the performance and documentation of a specific activity.

7.3 ACCEPTANCE DOCUMENTATION

A verifier will indicate acceptance of all work performed as well as the resultant documentation by signing (or initialing) and dating the appropriate form or space provided. Provisions for checking will be incorporated into the SAP as appropriate.

Differences between the verifier and work performer will be discussed and resolved. If agreement cannot be reached, the differences will be brought to the attention of succeeding higher levels of management until resolution is achieved.

7.4 CHECK FREQUENCY

Undocumented checks (surveillance) may be performed, as assigned, during the activity. A check of documentation will be performed at the completion of the task.

7.5 DOCUMENTATION OF CHECKS

The checking function will be documented in compliance with the applicable procedures for the specific task performed and retained for record purposes until project completion.

7.6 ANALYTICAL LABORATORY QC

The internal QC procedures will be described in the Laboratory QA Plan, together with associated SOPs. The laboratory QA manuals and SOP must be provided upon request to the SMT by the QC Manager for review and approval for use on this project. Items that will be covered in these procedures and plans include:

- Matrix spikes
- Matrix spike duplicates
- Replicates
- Blanks (field, trip, method, reagent instrument, decontamination, and source water)
- Internal standards and surrogates
- Calibration and calibration verification
- Control charts
- Standards and standard sources
- Reagents and gases

7.7 FIELD SAMPLING QC

7.7.1 FIELD QC SAMPLES

Field QC samples are identified in the SAP (Volume II). Field blanks will be used at the discretion of the QC Manager if there is a reason to suspect contamination introduced in the field. Following Ecology guidance, field spikes are not planned for the RI; however they remain an option for the QC Manager if unusual circumstances warrant their use. Replicate samples are planned for the RI; in general, they will be incorporated at a minimum frequency of 1 in every 20 samples and/or at an aggregate frequency of 5 percent.

7.7.2 CORRECTIVE ACTION

The FOLs occasionally may be required to adjust the sampling program to accommodate site-specific needs and to control quality. If it becomes necessary to modify field sampling as described in the SAP (Volume II), corrective action will be taken to ensure proper, approved procedures are implemented. Field change request forms will be completed as appropriate (Section 11.6). Such action might include the discarding and recollection of samples, or if samples have been sent for analysis, the laboratory may be contacted to terminate analysis. All corrective actions will be documented and reported immediately to the Technical Lead, QC Manager, or Project Manager.

7.7.3 CONTAMINATION

If sample results indicate contamination of field or trip blanks (detections above PQL), sampling and analysis may be performed again for the associated target analytes. The Project Manager, in conjunction with the QC Manager, will make this decision.

7.8 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

QA/QC samples are necessary to ensure the precision, accuracy, representativeness, comparability, and completeness of the data. Four types of QA/QC samples will be processed: trip blank, field blank, field duplicate, and equipment rinsate (rinse blank). The field blank, field duplicate, and equipment rinsate are collected in the field, and the trip blank is provided by the analytical laboratory. In addition, other QA/QC samples will be evaluated at the discretion of the QC Manager to include blind duplicates, blind blanks, and blind spikes. Descriptions of these types of QA/QC samples are provided in the following sections.

7.8.1 TRIP BLANK

Trip blanks are samples that originate from analyte-free water taken from the laboratory to the sampling site and returned to the laboratory with the volatile organic compound (VOC) samples. One trip blank will accompany each cooler containing samples that will be submitted for VOC analysis. The trip blanks are used to assess the QA/QC of sample preservation, packing, shipping, and storage.

7.8.2 SOURCE WATER BLANK

Source water blanks, which consist of the source water used in decontamination and cleaning, are collected and analyzed to determine the level of contamination introduced into the sample due to the sampling technique employed. One source water blank from each source of water will be collected and analyzed for the same parameters as the related samples.

7.8.3 FIELD DUPLICATE

For every 20 samples taken, one duplicate sample will be collected and submitted for laboratory analysis. The duplicate sample is designed to be identical to the original sample and is submitted to gain precision information on homogeneity, handling, shipping, storage and preparation, and analysis. Duplicate sampling is used to identify possible field variations. The duplicate sample will be collected at the same time and location as the environmental sample.

7.8.4 EQUIPMENT RINSATE

Equipment rinsates are the final analyte-free rinse water from equipment decontamination. These samples will be collected after the individual sampling event. The rinse blanks will be analyzed to ensure that decontamination procedures are sufficient, and that no cross-contamination occurred. To collect the equipment rinsate, deionized water will be poured through the cleaned equipment and collected into 1-liter amber glass bottles. The results from the rinse blanks will be used to flag or assess the levels of analytes in the samples. The rinsates will be analyzed for the same parameters as the related samples.

7.8.5 OTHER QA/QC SAMPLES

Discretionary QA/QC samples include blind duplicates, blind blanks, and blind spikes. Blind duplicates are duplicate samples, preferably split from the same container, which are numbered by the same convention as the other samples so that the laboratory does not know they are duplicates. Similarly, blind blanks are samples of similar matrix to the field samples, known to be free of target contaminants. Blind blanks are also submitted to the laboratory using an identification scheme such that the laboratory does not know they are uncontaminated blanks. Blind spikes are field samples spiked to known concentrations of selected target analytes and submitted with the field samples to the laboratory using an identification scheme such that the laboratory does not know they are spiked samples. The use of field spikes is not recommended by Ecology (Ecology, Publication 91-16, 1991a); therefore, field spikes are not planned for this project.

7.9 SPLIT SAMPLES

Split samples may be taken and sent to another laboratory for analysis in order to check the degree of variance introduced by the laboratory in analyzing the samples. If split

sampling is required, the frequency and analysis and the name of the second laboratory shall be included in the SAP. As an alternative, the duplicate sample can be used as a split sample; this determination will be made by the QC Manager, at the direction of the Project Manager.

7.10 CORRECTIVE ACTION

The FOLs occasionally may be required to adjust the sampling program to accommodate site-specific needs. If it becomes necessary to modify field sampling as described in the SAP, corrective action will be taken to ensure proper, approved procedures are implemented. If samples have been collected, these samples may be discarded and new samples taken. If samples have been sent for analysis, the laboratory may be contacted to terminate analysis. All corrective actions will be documented and reported immediately to the Technical Lead, QC Manager, QA Manager, or Project Manager.

7.11 CONTAMINATION

If sample results indicate contamination of field or trip blanks (detections above PQL), sampling and analysis may be performed again for the associated target analytes. The Project Manager, in conjunction with the QC Manager, will make this decision.

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