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A Portage Shaw Joint Venture Company

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SUBJECT MATTER AREA: Engineering	**PREPARER: K. Holland**	**Page 1 of 8**
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REVISION LOG

Revision Number	Description of Changes	Pages Affected
0	Initial Release. Intent Change. Changed numbers and headings to define the beginning point of PRS documentation. This document replaces BJC-ES-2704, *Trip, Equipment and Field Blank Preparation*, Rev. 0; GEO-TEC-009, *Collection of Field QC Samples*, Rev. 2; and W-156-PWOS, *Collection of Field Quality Control Samples*, Rev. 1.	All

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1.0 PURPOSE

This procedure establishes guidelines for preparation and use of QC samples (Equipment Rinsate Blank, Field Blank, Trip Blank, and Field Duplicate Samples) collected during field sampling activities.

2.0 SCOPE

This procedure shall be used for environmental sampling performed by PRS personnel.

3.0 PROCEDURE

NOTE: The PRS blue-sheeted BJC procedures referenced in this document are the active procedures as of the date of issuance of this procedure. Procedures noted in parentheses will become the reference procedures once these procedures are approved and implemented by Paducah Remediation Services, LLC.

3.1 Equipment and Materials

The Sample Handler (or designee) is accountable for gathering all needed equipment, tools, and supplies to safely and successfully collect QC samples. The items listed in this section may be used as a guide, but may not be a complete list. Refer to the task-specific AHAs, WP, and the RWP (if one is required) to determine what supplies, materials, and equipment are needed to collect QC samples.

1. Analyte-free water for inorganic and radiologic analysis, if applicable.
2. Organic-free water for organic analysis, if applicable.
3. Sample containers appropriate for the samples to be collected with COAs, or certificates of cleanliness.
4. Field Logbook(s).
5. PPE and other safety equipment specified by the AHA and RWP.
6. Labels and appropriate forms for sample shipment (i.e., COC forms, custody seals, sample labels generated from PEMS data base, etc.)
7. Black indelible ink pens.
8. Plastic sheeting and Ziploc bags.
9. Decontamination equipment and supplies.
10. Cooler and sealing tape.

3.2 Summary of Method

Field QC samples are used to determine the presence and concentration of contaminants resulting from field activities and to measure/control variables in sample handling. Field QC samples may consist of field blanks, equipment rinsate blanks, trip blanks, and/or field duplicate samples.

Field QC samples assist in ensuring that the accuracy of analytical results are stated with a high level of confidence.

The frequency that field QC samples are to be collected and their appropriate preservation requirements will be defined by the task-specific WP.

3.3 Preparing an Equipment Rinsate Blank

Equipment rinsate blanks are prepared in the field using analyte-free or organic-free water as required by the task-specific WP. These samples are used to determine if contaminants have been introduced by contact of the sample medium with contaminated sampling equipment. This serves as a QC check on the cleanliness of the sampling device and, therefore, the equipment decontamination process. Equipment rinsate blanks are required only when non-disposable or non-dedicated sampling equipment is being used.

Peristaltic Pump

Pump analyte-free or organic-free water directly from the analyte-free water bottle, through the decontaminated tubing, and into the sample bottles.

Submersible Pump

Pour analyte-free or organic-free water into a clean container and pump water from the container through the decontaminated hose and into the sample bottles.

Bladder Pump

Fill a 3-m (10-ft) length of at least 10-cm (4-in.)-diameter clean pipe (sealed at one end), or other container specified in the WP, with analyte-free or organic-free water. Pump the water through the pump and into the sample bottles. It may be necessary to add water to the pipe during pumping.

Sampling Equipment and Devices

Run analyte-free or organic-free water over or through the decontaminated sample collection equipment or device and into the sample bottles.

3.4 Preparing a Field Blank

Field Blanks are prepared in the field using analyte-free or organic-free water as required by the task-specific WP. These samples are used to evaluate the potential for contamination of a sample by ambient site contaminants from a source not associated with the sample collected (e.g., air-borne fugitive dust or organic vapors). Field blanks should be collected in dusty environments and/or from areas where volatile organic contamination is present in the atmosphere and originating from a source other than the source being sampled.

1. Transport analyte-free or organic-free water to the field in a sealed container.

2. Open the container in the field near the sampling location and pour the analyte-free or organic-free water into the sample bottle.

3.5 Preparing a Field Duplicate Sample

Field duplicate samples may be either subsamples (replicate) or co-located samples and shall be collected using the same procedural requirements as a nonduplicate sample. The type of duplicate sample will be specified in the WP.

Disturbance or mixing of samples for VOC or mercury analysis must be avoided. The duplicate sample may need to be collected as a co-located sample (e.g., soil from adjacent locations or depths) to prevent the potential loss of volatile compounds/analytes.

1. Collect sample material using the same procedural requirements as a nonduplicate sample.

2. **IF** the duplicate is a subsample (replicate), **THEN** collect ample volume in order to meet the volume needed to fill two sets of bottles for all analyses being conducted and thoroughly homogenize each sample.

3. Place samples in separate, but identical containers for analysis at the same laboratories.

3.6 Preparing a Field Split Sample

Field split samples are a variation of field duplicate samples. Two or more representative portions are taken from a sample and are analyzed by different laboratories. Prior to splitting, a sample is mixed (except volatiles) to minimize sample heterogeneity.

Disturbance or mixing of samples for VOC or mercury analysis must be avoided. The split sample may need to be collected as a co-located sample (e.g., soil from adjacent locations or depths) to prevent the potential loss of volatile compounds/analytes.

1. Collect sample material using the same procedural requirements as a nonduplicate sample. Collect ample volume in order to meet

the volume needed to fill two sets of bottles for all analyses being conducted.

2. Thoroughly homogenize the sample (except volatiles).

3. Place samples in separate, but identical containers for analysis at the different laboratories.

3.7 Preparing a Trip Blank

Trip blanks are used to determine if samples were contaminated during storage and transportation to the laboratory. Trip blanks normally are used when samples are to be analyzed for VOC or tritium. Unless specified otherwise in the site-specific sampling plan, aqueous trip blanks are used for both water and soil/sediment samples.

1. Place the trip blank consisting of 2-3 pre-prepared sample vials of organic-free water in the cooler that will contain VOC samples. The trip blanks shall be kept with the investigative samples they represent from the field to the laboratory and shall be left unopened.

2. Trip blanks shall be packed for shipment with the investigative VOC samples and sent for analysis.

3.8 Post-Performance Actions

1. Post-performance activities of QC samples will be in accordance with the procedural requirements of the appropriate sampling method (e.g., surface water sampling, groundwater sampling, soil sampling) or WP requirements.

2. Complete COC forms in accordance with BJC-ES-2708, *Chain of Custody Protocol for Environmental Sampling* (PRS-ENM-2708, *Chain of Custody Forms, Field Sample Logs, Sample Labels, and Custody Seals*).

3. Sample containers shall undergo radiation surveys to be performed by a RCT in accordance with EH-4516, *Radioactive Contamination Control and Monitoring* (PRS-RAD-1109, *Radioactive Contamination Control and Monitoring*) and, as appropriate, tagged and labeled in accordance with EH-4517, *Posting and Labeling* (PRS-RAD-1108, *Posting and Labeling*).

4. If off-site laboratory analysis is required, in coordination with the RCT, release the sample(s) and related COC documentation to the transportation specialist, or designee, for further handling in accordance with EH-4527, *Receipt, Transport, and Movement of Radioactive Materials* (PRS-RAD-1105, *Receipt, Transport and Movement of Radioactive Materials*), and TR-9503, *Shipping Samples from a Bechtel Jacobs Company Site* (PRS-WSD-9503, *Offsite Sample Shipping*).

5. Nondisposable sampling equipment, tools, or supplies shall be decontaminated in accordance with BJC-ES-2702, *Decontamination of Sampling Equipment and Devices* (PRS-ENM-2702, *Decontamination of Sampling Equipment and Devices*). Prior to transporting contaminated equipment, tools or supplies, contact the Transportation Specialist.

6. Any IDW generated by the decontamination process will be collected, segregated into appropriate containers, labeled, and disposed of (or treated prior to disposal) in accordance with the requirements in the WP. Prior to transporting IDW, contact the Transportation Specialist.

4.0 RECORDS

The Field Logbook along with sample container COA or certificates of cleanliness, and COC Form(s) are project records and shall be maintained according to BJC-OS-1001, *Records Management, Including Document Control* (PRS-DOC-1009, *Records Management, Administrative Records, and Document Control*).

5.0 SOURCE DOCUMENTS

U.S. Environmental Protection Agency, November 2001. *Environmental Investigations Standard Operating Procedures and Quality Assurance Manual, Section 5*. Region 4, Environmental Compliance Branch, Athens, GA.

Attachment A
DEFINITIONS/ACRONYMS
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DEFINITIONS

Equipment Rinsate Blank: A sample of analyte-free or organic-free water poured over and/or through decontaminated sampling equipment. The purpose of the equipment rinse blank is to assess the adequacy of the decontamination process.

Field Blank: A blank solution of analyte-free or organic-free water that is prepared in the field and subjected to all aspects of sample collection, field-processing, preservation, transportation, and laboratory handling as an environmental sample. Field blanks should be collected in dusty environments and/or from areas where volatile organic contamination is present in the atmosphere and originating from a source other than the source being sampled.

Field Duplicate Sample: Samples are one of two types: subsample (replicated) or co-located. Subsamples are similar to a split sample except the same laboratory analyzes both samples. These samples do not assess site heterogeneity, only specific sample point heterogeneity. The material may be homogenized (except volatiles) before being divided. Co-located samples are two or more separate portions collected from side by side locations at the same point in time and space so as to be considered identical. These samples are used to assess precision of the total method, including sampling, analysis, and site heterogeneity. These separate samples are said to represent the same population and are carried through all steps of the sampling and analytical procedures in an identical manner.

Trip Blank: A sample that is prepared prior to the collection of VOCs or tritium and is stored with the investigative samples throughout the sampling event. These samples are then packaged for shipment with the other samples and submitted for analysis. At no time after their preparation are trip blanks to be opened before reaching the laboratory. If samples are to be shipped, trip blanks are to be provided with each shipment that contains VOC or tritium samples, but not for each cooler.

Split samples: Two or more representative portions taken from a sample in the field or laboratory, analyzed by at least two different laboratories. Prior to splitting, a sample is mixed (except volatiles) to minimize sample heterogeneity. These are quality control samples used to assess precision, variability, and data comparability between different laboratories.

Sample Handler: The person (or designee) responsible for ensuring that sampling activities are performed in accordance with the approved work package and associated procedures, and approving (or coordinating the approval of) deviations there from. Specific position titles with these responsibilities may be designated as: project technical lead, sampling manager, lead engineer, sampling team leader, or task leader.

Attachment A
DEFINITIONS/ACRONYMS
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ACRONYMS

AHA - Activity Hazard Analyisis

COA - Certificate of Analysis

COC - Chain-of-Custody

IDW - Investigation-Derived Waste

PEMS - Project Environmental Measurements System

PPE - Personal Protective Equipment

PRS - Paducah Remediation Services, LLC

QC - Quality Control

RCT - Radiological Controls Technician

RWP - Radiological Work Permit

VOC - Volatile Organic Compound

WP - Work Package