# Hanford Facility RCRA Permit Modification Notification Forms

## Part III, Operating Unit Group 11

## Integrated Disposal Facility

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Submitted by Co-Operator:

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| Hanford Facility RCRA Permit Modification Form | |
|---|---|
| Unit:<br>***Integrated Disposal Facility*** | Permit Part<br>***Part III, Operating Unit Group 11*** |

Description of Modification:

**Appendix C7A**

The purpose of this modification is to update permit text to remove Table C7A-2 of target parameters and associated references, and to clarify related sampling objectives. Table C7A-2 introduces unnecessary complications to the otherwise routine process a receiving TSD facility performs to ensure their waste acceptance requirements are being met. The monthly/quarterly sampling of the LCRS and semi-annual sampling of the LDS are sufficient to determine the health of the landfill and characterize the leachate for compliant storage at IDF.

The changes were made in the following sections:

- C7A.1.1 Updated Permit Conditions reference and sampling objectives regarding leachate sampling regarding LERF/ETF waste acceptance criteria.
- C7A.1.3 Removed reference to LERF/ETF from Waste Services.
- C7A.2 Updated Permit Conditions reference.
- C7A.2 Removed Table C7A-2 and text in reference to table C7A-2.
- C7A.2.1 Removed callout for Table C7A-2 and updated callout for Table C7A-3 to C7A-2.
- C7A.2.3 Updated table callout Table C7A-3 to C7A-2 and updated the table to reflect revised target parameters.
- C7A.3.2 Updated table callout Table C7A-3 to C7A-2.

| WAC 173-303-830 Modification Class | Class 1 | Class 1 | Class 2 | Class 3 |
|---|---|---|---|---|
| Please mark the Modification Class: | | X | | |

Enter relevant WAC 173-303-830:

Appendix I: B.1.b [General Facility Standards … provides for incorporation of changes associated with F039 (multisource leachate) sampling or analysis methods]

Modification Approved: ☒ Yes ☐ No

Reviewed by Ecology:

2026.03.12 10:25:12 -07'00'

E. J. Holbrook

Date

**Revision Instructions:**

Revise following to incorporate the redlined changes to:

Appendix C7A

# INTEGRATED DISPOSAL FACILITY
# APPENDIX C7A
# SAMPLING AND ANALYSIS PLAN FOR INTEGRATED DISPOSAL FACILITY LEACHATE
# CHANGE CONTROL LOG

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The "**Modification Number**" represents Ecology's method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

| Modification Date | Modification Number |
|---|---|
| 06/09/2023 | 8C.2023.2F |

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# INTEGRATED DISPOSAL FACILITY
# APPENDIX C7A
# SAMPLING AND ANALYSIS PLAN FOR INTEGRATED DISPOSAL FACILITY LEACHATE

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# APPENDIX C7A
# SAMPLING AND ANALYSIS PLAN FOR INTEGRATED DISPOSAL FACILITY LEACHATE

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## C7A.1 SAMPLING AND ANALYSIS PLAN REQUIREMENTS

This sampling and analysis plan (SAP) provides the objectives for sampling of leachate from the Integrated Disposal Facility (IDF) disposal cells leachate collection systems. Approved handling methods, management of the leachate, and monitoring requirements are based on this SAP.

The specifications of this SAP meet the quality assurance (QA) requirements for analytical services at the Hanford Site. This SAP also provides guidance to the IDF operations and laboratory support personnel in how to sample, analyze, and manage this waste.

### C7A.1.1 Sampling Objectives

This SAP specifies sampling and analysis requirements for the monitoring of IDF leachate, in accordance with Permit Conditions III.11.F.9.f.i and III.11.F.9.g.iii~~1.b and III.11.F.2.e~~. The sampling objectives are as follows:

Commented [CO1]: RCR #4

1. Leachate from the leachate collection and removal system (LCRS) shall be sampled and analyzed monthly for the first year of disposal cell operation, and quarterly thereafter, to support IDF *Resource Conservation and Recovery Act of 1976* (RCRA) permit monitoring activities.
2. Leachate from the leak detection system (LDS) shall be sampled semi-annually to support IDF RCRA permit monitoring activities, if a pumpable quantity of leachate is available for sampling.
3. ~~Leachate shall be sampled and analyzed to demonstrate compliance with the waste acceptance criteria of the receiving treatment, storage, and disposal (TSD) facility: the Liquid Effluent Retention Facility/Effluent Treatment Facility (LERF/ETF).~~

The sampling requirements in this SAP apply to both sampling objectives, unless stated otherwise.

Seperate from the sampling objectives outlined in this SAP, leachate will also be collected from the leachate collection units semi-annually (i.e., every six months) to analyze for parameters that demonstrate compliance with the Liquid Effluent Retention Facility & 200 Area Effluent Treatment Facility (LERF/ETF) Operating Unit Group (OUG) waste acceptance criteria. Leachate sampling for waste acceptance into another OUG ~~is a waste generator activity~~ will be~~is~~ performed in accordance with ~~other applicable~~unit specific waste acceptance ~~requirementsthe LERF/ETF OUG permit~~ requirements.

### C7A.1.2 Sampling and Analysis Schedule

Leachate sampling is the responsibility of IDF operations. The Operations Specialist (OS) initiates sampling activities with the sampling organization, in accordance with the frequencies identified in this SAP (Section C7A.2).

If sampling activities deviate from the frequencies identified in this SAP, an explanation will be documented in the Hanford Facility Operating Record (IDF portion).

### C7A.1.3 Project Management

This section addresses the project organization, roles, and responsibilities for leachate sampling activities at IDF. Titles used to describe the project organization are for the purposes of discussing the role of the individual in the performance of the work scope. The Permittees are responsible for planning, coordinating, sampling, preparing, packaging, and shipping samples to the analytical laboratory for analysis. Since leachate sampling requires interface between multiple organizations, changes to the project organization, roles, and responsibilities can occur to achieve specific sampling objectives. Individuals with different titles but similar/equivalent positions may fulfill these roles.

The project organization is described in the following key positions and is shown graphically in Figure C7A-1.

**Project Manager and Technical Lead:** The Project Manager (or designee) for leachate sampling activities is responsible for direct management of sampling documents and requirements, field activities,

and subcontracted tasks. The Project Manager is responsible for ensuring that project personnel are working to the approved, and most current, version of this SAP and for updating field personnel on changes.

**Operations Specialist (OS):** The OS initiates sampling activities and ensures sampling is completed in accordance with this SAP.

**Waste Services:** Waste services personnel will provide a designation on the leachate sample results ~~and will assist the project in updating the profile as needed with LERF/ETF~~.

**Environmental Compliance Officer (ECO):** The ECO provides technical oversight, direction, and acceptance of project and subcontracted environmental work, with the goal of minimizing adverse environmental impacts.

**Sample Management and Reporting:** The sample management and reporting (SMR) group oversees off-site analytical laboratories, coordinates laboratory analytical work with this plan, and verifies that laboratories are qualified for performing Hanford Facility analytical work. They generate field sampling documents, labels, and instructions for field sampling personnel and develop sampling authorization forms, which provide information and instruction to the analytical laboratories. The SMR group ensures that field sampling documents are revised to reflect approved changes. This group's responsibilities include receiving analytical data from the laboratories, performing data entry into the Hanford Environmental Information System (HEIS) database, and arranging for data validation and recordkeeping. The SMR group is responsible for resolving sample documentation deficiencies or issues associated with analytical laboratories. The SMR group is responsible for informing the project manager of any issues reported by the analytical laboratories.

**Analytical Laboratories:** The analytical laboratories analyze samples in accordance with established methods and the requirements of their subcontract, and provide data packages containing analytical and quality control (QC) results. Laboratories provide explanations of results to support data review and resolve analytical issues.

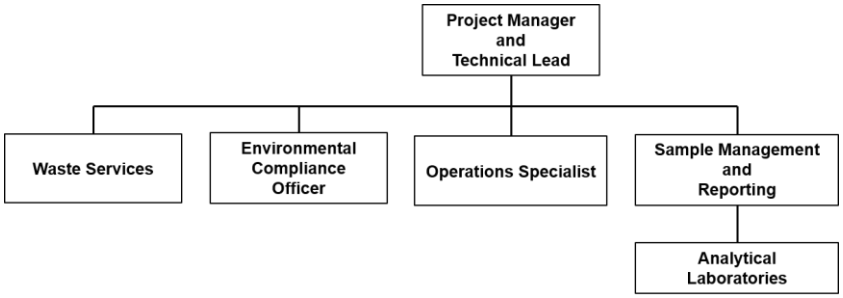


**Figure C7A-1 Project Organization**

## C7A.2 SAMPLING DESIGN AND PROCESS

Upon initiating waste disposal in each IDF disposal cell, leachate monitoring for the respective leachate collection system will begin according to the sampling and analysis requirements of this SAP.

For the first year of active waste disposal operations, leachate from the LCRS will be collected monthly to analyze for indicator parameters. Indicator parameters are identified in Table C7A-1. After one-year, the

sample frequency will be reduced to quarterly. In the event that there is insufficient quantity of leachate to complete the monthly/quarterly frequency, sampling will resume the following month/quarter and an explanation will be documented in the Hanford Facility Operating Record (IDF portion). Samples will be collected from the leachate transfer line access port located in the Crest Pad Building of each IDF disposal cell. The access port provides a direct connection to the LCRS sump.

Leachate from the LDS sump will be collected semi-annually (i.e., every six months) to analyze for indicator parameters (Table C7A-1) if a pumpable quantity of leachate is present, in accordance with Permit Condition III.11.F.9.g.iii~~2.e~~. Samples will be collected from the leachate transfer line access port that provides a direct connection to the LDS sump.

**Table C7A-1 Indicator Parameters for Integrated Disposal Facility Leachate Monitoring**

| Parameters |
|---|
| pH |
| Specific conductivity |
| Total organic carbon |
| Total organic halides |

~~Additionally, leachate will be collected from the leachate collection units semi-annually (i.e., every six months) to analyze for parameters that demonstrate compliance with LERF/ETF waste acceptance criteria. If a pumpable quantity of leachate is present in the Secondary Leak Detection System (tertiary sump), the leachate will be transferred to the leachate collection units and will be included in the semi-annual sampling for LERF/ETF acceptance. Target parameters associated with LERF/ETF acceptance are identified in Table C7A-2.~~

**~~Table C7A-2 Target Parameters for Liquid Effluent Retention Facility/ Effluent Treatment Facility Acceptance~~**

| ~~Parameter~~ | ~~CAS~~ | ~~Parameter~~ | ~~CAS~~ | ~~Parameter~~ | ~~CAS~~ |
|---|---|---|---|---|---|
| ~~Organics~~ | | | | | |
| ~~Acetone~~ | ~~67-64-1~~ | ~~Cresol (o, p, m)~~ | ~~1319-77-3~~ | ~~Methylene chloride~~ | ~~75-09-2~~ |
| ~~Acetophenone~~ | ~~98-86-2~~ | ~~Dichloroisopropyl ether (bis(2-chloroisopropyl)ether)~~ | ~~108-60-1~~ | ~~N-nitrosodimethylamine~~ | ~~62-75-9~~ |
| ~~Acetonitrile~~ | ~~75-05-8~~ | ~~Diphenylamine~~ | ~~112-39-4~~ | ~~Pyridine~~ | ~~110-86-1~~ |
| ~~Benzene~~ | ~~71-43-2~~ | ~~Di-n-octyl phthalate~~ | ~~117-84-0~~ | ~~Tetrachloroethylene~~ | ~~127-18-4~~ |
| ~~1-Butyl alcohol~~ | ~~71-36-3~~ | ~~Hexachlorobenzene~~ | ~~118-74-1~~ | ~~Tetrahydrofuran~~ | ~~109-99-9~~ |
| ~~Carbon disulfide~~ | ~~75-15-0~~ | ~~Hexachlorocyclopenta-diene~~ | ~~77-47-4~~ | ~~Tributyl phosphate~~ | ~~126-73-8~~ |
| ~~Carbon tetrachloride~~ | ~~56-23-5~~ | ~~Isophorone~~ | ~~78-59-1~~ | ~~2,4,6-Trichlorophenol~~ | ~~88-06-2~~ |
| ~~Chloroform~~ | ~~67-66-3~~ | ~~Lindane (gamma-BHC)~~ | ~~58-89-9~~ | ~~N/A~~ | ~~N/A~~ |
| ~~Anions/Cations and General Parameters~~ | | | | | |
| ~~Ammonia~~ | ~~7664-41-7~~ | ~~Fluoride~~ | ~~16984-48-8~~ | ~~Silver~~ | ~~7440-22-4~~ |
| ~~Arsenic~~ | ~~7440-38-2~~ | ~~Iron~~ | ~~4739-89-6~~ | ~~Sodium~~ | ~~7440-23-5~~ |

~~**Table C7A-2 Target Parameters for Liquid Effluent Retention Facility/ Effluent Treatment Facility Acceptance**~~

| ~~Parameter~~ | ~~CAS~~ | ~~Parameter~~ | ~~CAS~~ | ~~Parameter~~ | ~~CAS~~ |
|---|---|---|---|---|---|
| ~~Barium~~ | ~~7440-39-3~~ | ~~Lead~~ | ~~7439-92-1~~ | ~~Sulfate~~ | ~~14808-79-8~~ |
| ~~Beryllium~~ | ~~7440-41-7~~ | ~~Mercury~~ | ~~7439-97-6~~ | ~~Vanadium~~ | ~~7440-62-2~~ |
| ~~Cadmium~~ | ~~7440-43-9~~ | ~~Nickel~~ | ~~7440-02-0~~ | ~~Zinc~~ | ~~7440-66-6~~ |
| ~~Calcium~~ | ~~7440-70-2~~ | ~~Nitrate~~ | ~~14797-55-8~~ | ~~pH~~ | ~~pH~~ |
| ~~Chloride~~ | ~~16887-00-6~~ | ~~Nitrite~~ | ~~14797-65-0~~ | ~~Specific Conductivity~~ | ~~CONDUCT~~ |
| ~~Chromium~~ | ~~7440-47-3~~ | ~~Potassium~~ | ~~7440-09-7~~ | ~~Total Dissolved Solids (TDS)~~ | ~~TDS~~ |
| ~~Copper~~ | ~~7440-50-8~~ | ~~Selenium~~ | ~~7782-49-2~~ | ~~Total Organic Carbon (TOC)~~ | ~~TOC~~ |
| ~~Cyanide~~ | ~~57-12-5~~ | ~~Silicon~~ | ~~7440-21-3~~ | ~~Total Suspended Solids (TSS)~~ | ~~TSS~~ |
| ~~Magnesium~~ | ~~7439-95-4~~ | ~~Phosphate~~ | ~~14265-44-2~~ | ~~N/A~~ | ~~N/A~~ |

~~Note: The target parameters listed in this table are required analyses for influent aqueous wastes at LERF/ETF. Changes to this list, including the addition or exclusion of parameters, will be made upon direction from LERF/ETF waste acceptance.~~

~~CAS = Chemical Abstracts Service~~

~~ETF = Effluent Treatment Facility~~

~~IDF = Integrated Disposal Facility~~

~~LERF = Liquid Effluent Retention Facility~~

### C7A.2.1 Sampling Handling

To ensure sample and data usability, sampling will be performed in accordance with established sampling practices, procedures, and requirements pertaining to sample collection, collection equipment, and sample handling. Sampling generally includes the following:

1. Preparation and review of sampling paperwork such as chain-of-custody or labels.
2. Sample container and equipment preparation.
3. Sample collection.
4. Sample packaging and shipping.

To prevent potential contamination of the samples, clean equipment will be used for each sampling activity. Level I U.S. Environmental Protection Agency (EPA) pre-cleaned sample containers will be used for samples collected for chemical analysis. Container sizes may vary, depending on laboratory-specific volumes/requirements. Container types and sample amounts/volumes are identified on the chain-of-custody form.

Table~~s~~ C7A-1 ~~and C7A-2~~ provides the required parameters necessary for the sampling of the leachate from the IDF disposal cells. Analytical methods are provided in Table C7A-2~~3~~. If IDF identifies a change in analytical data, additional analysis may be required.

**Commented [CO2]:** RCR #9

Each sample container will be labeled with the following information on firmly affixed, water resistant labels:

1. HEIS number.
2. Sample collection date and time.
3. Analysis required.
4. Preservation method (if applicable).

5. Chain-of-custody number.

In addition, sample records must include the following information:

1. Analysis required.
2. Source of sample.
3. Matrix (water, soil, etc.).

Sample handling and transfer will be in accordance with established methods to preclude loss of identity, damage, deterioriation, and loss of sample.

### C7A.2.2 Sample Custody

Sample custody will be maintained in accordance with existing protocols to ensure that sample integrity is maintained throughout the analytical process. Chain-of-custody protocols will be followed throughout sample collection, transfer, analysis, and disposal to ensure sample integrity is maintained. A chain-of-custody record will be initiated in the field at the time of sampling and will accompany each set of samples shipped to any laboratory.

Shipping requirements will determine how sample shipping containers are prepared for shipment. The analyses requested for each sample will be indicated on the accompanying chain-of-custody form. Each time the responsibility for the custody of the sample changes, new and previous custodians will sign the record and note the date and time. The field sampling team will make a copy of the signed record before sample shipment.

The following minimum information is required on a completed chain-of-custody form:

1. Project name.
2. Collectors' names.
3. Unique sample number.
4. Date, time, and location (or traceable reference thereto) of sample collection.
5. Matrix.
6. Preservatives.
7. Chain-of-possession information (i.e., signatures and printed names of each individual involved in the transfer of sample custody and storage locations, and dates/times of receipt and relinquishment).
8. Requested analyses (or reference thereto).
9. Number of sample containers per unique sample identification number.
10. Shipped-to information (i.e., analytical laboratory performing the analysis).

Samplers should note any anomalies with the samples. Custody seals or custody tape will be used to verify that sample integrity has been maintained during sample transport. The custody seal will be inscribed with the sampler's initials and date. If during the chain-of-custody process it is discovered that the custody tape has been tampered with or broken on the sample bottle, the sample will be analyzed but the results will include a flag to indicate that custody was broken. If the custody tape has been tampered with or broken on the cooler, the sample custodian shall note this on the sample receiving documentation. A sampling and analytical database is used to track samples from the point of collection through the laboratory analysis process.

### C7A.2.3 Analytical Methods

Laboratory testing for parameters described in Section C7A.2 may include non-target analytes that are part of the analytical method. The additional constituents that are part of the method and reported by the laboratory are for informational purposes. Analytical performance requirements will be applicable only to the analytes specific to this SAP. Poor QC related to non-target analyte results would not result in any required corrective action by the laboratory, except for the application of proper result qualification flags. Table C7A-23 provides information regarding analytical method requirements for samples collected. Updated EPA methods and nationally recognized standard methods may be substituted for the analytical methods identified in order to follow changed requirements in the method update.

Sampling processes will adhere to the representative sample method in accordance with Washington Administrative Code (WAC) 173-303-110(2), *Sampling, testing methods, and analyses*, and the standards of this SAP. QA and QC standards will be maintained in accordance with the analytical methods of the most recent revision of the published test methods (e.g., SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, Third Edition; final Update VI*). The analytical methods and performance requirements (e.g., precision, accuracy) are performed in accordance with established measurement performance criteria. Practical quantitation limits (PQLs) are established by SMR and the analytical laboratory. The PQL is defined as the lowest concentration that can reliably be achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

**Table C7A-23 Analytical Methods, Preservation, and Holding Times**

| Method | Analysis | Preservation | Holding Time* |
|---|---|---|---|
| 350.1 | Determination of Ammonia Nitrogen by Semi-Automated Colorimetry | H2SO4 to pH < 2; Cool to ≤ 6°C | 28 days |
| SM 2540 | Total suspended solids | Cool to ≤ 6°C | 7 days |
| 2540C / 160.1 | Total dissolved solids | Cool to ≤ 6°C | 7 days |
| 6010 | ICP-AES (Metals) | HNO3 to pH < 2 | 6 months |
| 6020 | ICP-MS (Metals) | HNO3 to pH < 2 | 6 months |
| 7470 | Mercury in Liquid Waste (Manual Cold-Vapor Technique) | HNO3 to pH < 2 | 28 days |
| 8081 | GC (Organochlorine Pesticides) | Cool to ≤ 6°C | 7 days from sampling to extraction; 40 days from extraction to analysis |
| 8260 | GC/MS (Volatile Organic Compounds) | Cool to ≤ 6°C | 14 days from sampling to extraction; 40 days from extraction to analysis |
| 8270 | GC/MS (Semivolatile Organic Compounds) | Cool to ≤ 6°C | 7 days from sampling to extraction; 40 days from extraction to analysis |
| 9012 | Colorimetric (Total Cyanide) | NaOH to pH ≥ 12; Cool to ≤ 6°C | 14 days |

**Table C7A-~~2~~3 Analytical Methods, Preservation, and Holding Times**

| Method | Analysis | Preservation | Holding Time* |
|---|---|---|---|
| ~~9014~~ | ~~Free Cyanide~~ | ~~NaOH to pH ≥ 12; Cool to ≤ 6°C~~ | ~~14 days~~ |
| 9020 | Total organic halides (TOX) | H2SO4 to pH < 2; Cool to ≤ 6°C | 28 days |
| 9040 | pH | None | ASAP |
| 9050 / 120.1 | Specific Conductivity | Cool to ≤ 6°C | 28 days |
| ~~9056 / 300.0~~ | ~~Inorganic Anions~~ | ~~Cool to ≤ 6°C~~ | ~~28 days from sampling to extraction; 48 hours from extraction to analysis~~ |
| 9060 | Total organic carbon | HCl or H2SO4 to pH < 2; Cool to ≤ 6°C | 28 days |

Reference: For four-digit EPA methods, see SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods,* Third Edition; Final Update VI. For Standard Methods, see American Public Health Association (APHA)/American Water Works Association (AWWA)/Water Environment Federation (WEF), 2017, *Standard Methods for the Examination of Water and Wastewater*.

*Holding times are from sampling to analysis unless specified otherwise.

~~AES = Atomic emission spectrometry~~
ASAP = As soon as possible
EPA = Environmental Protection Agency
~~GC = Gas chromatography~~
~~ICP = Inductively coupled plasma~~
~~MS = Mass spectrometry~~

### C7A.2.4 Waste Management

Packaging and labeling during waste storage and transportation will meet WAC 173-303 *Dangerous Waste Regulations*, and U.S. Department of Transportation (DOT) requirements, as appropriate. Packaging exceptions to DOT requirements may be used for on-site waste shipments if documented as such and if the packaging provides an equivalent degree of safety during transportation. Off-site analytical laboratories are responsible for the disposal of unused sample quantities.

## C7A.3 QUALITY ASSURANCE PROJECT PLAN

A Quality Assurance Project Plan (QAPjP) establishes the quality requirements for environmental data collection. It includes planning, implementation, and evaluation of field sampling, laboratory analysis, and data review. The information in this QAPjP complies with the QA requirements for analytical services at the Hanford Site and supplements the contractor's environmental QA program plan.

### C7A.3.1 Quality Assurance Objectives and Criteria

The QA objective of this plan is the generation of analytical data of known and appropriate quality. Data descriptors known as data quality indicators (DQIs) help determine the acceptability and usefulness of data to the user. Applicable QC guidelines, DQI acceptance criteria, and levels of effort for assessing data quality are dictated by the intended use of the data and requirements of the analytical method. DQIs are evaluated during the data usability assessment process in a manner consistent with the definitions provided in SW-846, as detailed in the following sections.

#### C7A.3.1.1 Precision

Precision measures the agreement among a set of replicate measurements. Field precision is assessed through the collection and analysis of field duplicates. Analytical precision is estimated by duplicate/replicate analyses, usually on laboratory control samples, spiked samples, and/or field samples. The most commonly used estimates of precision are the relative standard deviation and, when only two samples are available, the relative percent difference.

#### C7A.3.1.2 Accuracy

Accuracy is the closeness of a measured result to an accepted reference value. Accuracy is usually measured as a percent recovery. QC analyses used to measure accuracy include laboratory control samples, spiked samples, and surrogates.

#### C7A.3.1.3 Completeness

Completeness is a measure of the amount of valid data collected compared to the amount planned. Measurements are considered to be valid if they are unqualified or qualified as estimated data during validation. Field completeness is a measure of the number of samples collected versus the number of samples planned. Laboratory completeness is a measure of the number of valid measurements compared to the total number of measurements planned.

#### C7A.3.1.4 Comparability

Comparability expresses the degree of confidence with which one data set can be compared to another. It is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the approved plans are followed and that proper sampling and analysis techniques are applied. Further, when assessing comparability, data sets should be of known and documented quality.

#### C7A.3.1.5 Representativeness

Sample representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. It is dependent on the proper design of the sampling program and will be satisfied by ensuring the approved plans were followed during sampling and analysis.

### C7A.3.2 Quality Control

Field QC samples are collected to evaluate the potential for cross-contamination and provide information pertinent to field sampling variability and laboratory performance to help ensure reliable data are obtained. Field QC samples include collection of field duplicates and field trip blanks (i.e., full trip blank [FTB], field transfer blank [FXR]). Field blanks are typically prepared using high-purity reagent water.[1] QC sample definitions are provided below.

**Field duplicates:** independent samples collected as close as possible to the same time and same location as the sample schedule, and intended to be identical. Field duplicates are placed in separate sample containers and analyzed independently. Field duplicates are used to determine precision for both sampling and laboratory measurements.

**Field transfer blanks (FXRs):** preserved volatile organic analysis sample vials filled with high-purity water at the sample collection site where volatile organic compounds (VOCs) samples are collected. FXR samples are prepared during sampling to evaluate potential contamination attributable to field conditions.

[1] Reagent water is high-purity water that is generally defined as water that has been distilled, deionized, or any combination of distillation, deionization, reverse osmosis, activated carbon filtration, ion exchange, particulate filtration, or other polishing techniques.

After collection, FXR sample vials are sealed and placed into the same storage containers with samples collected the same day for the associated sampling event. FXR samples are analyzed for VOCs only.

**Full trip blanks (FTBs):** bottles prepared by the sampling team before travel to the sampling site. The preserved bottle set is either for volatile organic analysis only or identical to the set that will be collected in the field. It is filled with high-purity water and the bottles are sealed and transported (unopened) to the field in the same storage containers used for samples collected that day. Collected FTBs are typically analyzed for the same constituents as the samples from the associated sampling event. FTBs are used to evaluate potential sample contamination from the sample bottles, preservative, handling, storage, and transportation.

Laboratory QC samples estimate the precision and bias of the analytical data. Internal QA/QC programs are maintained by analytical laboratories and, at a minimum, include the use of laboratory control samples and method blank. Other QC analyses can include the use of laboratory sample duplicates, matrix spikes, matrix spike duplicates, and surrogates. These QC analyses follow EPA methods. QC checks outside of control limits are documented in analytical laboratory reports and during a DQI evaluation. Preservation techniques and holding times are specified in Table C7A-2~~3~~. The analytical laboratory provides QC details with the data report package. DQIs are a function of QC for field and laboratory measurements, as further defined in Section C7A.3.1.

### C7A.3.3 Data Management

Data generated from laboratory analysis will be reported in an organized format that contains the supporting information required in the data report package for the appropriate level of data review. The data report identifies analytical information such as the measured parameters, the details of analysis, the reported data values, and associated data or laboratory qualifiers.

The SMR group, in coordination with IDF personnel, are responsible for ensuring that analytical data are appropriately reviewed, managed, and stored in accordance with applicable programmatic requirements governing data management methods.

Electronic data access, when appropriate, will be through a Hanford Site database (e.g., HEIS). Where electronic data are not available, hard copies will be provided.

### C7A.3.4 Assessment and Oversight

Assessment and oversight activities address the effectiveness of project implementation and associated QA/QC activities. Oversight activities in the analytical laboratories, including corrective action management, are conducted in accordance with the laboratory's QA plan. The SMR group oversees off-site analytical laboratories and verifies the laboratories are qualified to perform Hanford Facility analytical work.

### C7A.3.5 Data Review and Verification

This section addresses QA activities that occur after data collection. These activities determine whether the data conform to the specified criteria, thus satisfying project objectives. Data review and verification are performed to confirm that sampling and chain-of-custody documentation are complete. This review includes linking sample numbers to specific sampling locations, and reviewing sample collection dates and sample preparation and analysis dates to assess whether holding times, if any, have been met. Furthermore, review of QC data is used to determine whether analyses have met the data quality requirements specified in this SAP.

## C7A.4 DOCUMENTS AND RECORDS

Logbooks are required for field activities. The logbook must be identified with a unique project name and number. Individuals responsible for logbooks will be listed. Only authorized persons may make entries in logbooks. Logbooks will be signed by the sampling lead, cognizant scientist/engineer or other responsible individual. Logbooks will be permanently bound, waterproof, and ruled with sequentially numbered pages. Pages will not be removed from logbooks for any reason. Entries will be made in indelible ink. Corrections will be made by marking the erroneous data through with a single line, entering the correct data, and initialing and dating the changes. Deviations from field sampling or issues encountered in the field are documented appropriately (e.g., in the logbook). A summary of the available information to be recorded in logbooks is as follows:

1. Sampling location.
2. Date.
3. Time.
4. Type of sample(s) (hazardous waste leachate).
5. Deviations from SAP.
6. Any other information requested by IDF.

Convenience copies of laboratory analytical results are maintained in the HEIS database. Records may be stored in either electronic or hard copy format. Documentation and records, regardless of medium or format, are controlled in accordance with internal work requirements and processes that ensure accuracy and retrievability of stored records.

Records developed in support of waste sample collection and analysis are stored and maintained in the Hanford Facility Operating Record (IDF portion), in accordance with WAC 173-303-380, *Facility recordkeeping*, and as required by the applicable Hanford Facility RCRA Permit Conditions II.I, Facility Operating Record.

## C7A.5 REFERENCES

*Resource Conservation and Recovery Act of 1976*, 42 U.S.C. 6901 et seq. Available at: https://www.epa.gov/laws-regulations/summary-resource-conservation-and-recovery-act.

SW-846, 2019, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, Third Edition; Final Update VI, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C. Compendium methods available at: https://www.epa.gov/hw-sw846/sw-846-compendium.

WAC 173-303, *Dangerous Waste Regulations*, Washington Administrative Code, Olympia, Washington. Available at: http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303.

303-110, *Sampling, testing methods, and analyses*.

303-380, *Facility recordkeeping*.