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DOCUMENT CATEGORY: Technical	LEVEL OF USE: ☒ Reference Level ☐ Continuous Use

Check all that apply:

TSR/NCS ☐ **WCO** ☐ **Shared Site** ☐

FUNCTIONAL AREA: Characterization (Sampling, Lab) **SUBJECT MATTER AREA:** Sampling	SUBJECT MATTER EXPERT: Chris Skinner, Sampling Field Manager
NUCLEAR SAFETY REVIEW DOCUMENTATION: FRNP-25-0427-S	RESPONSIBLE MANAGER/OWNER: Caleb Kline, Acting Characterization Manager
REQUIRED REVIEW DATE (or expiration date for temporary change): 10/2/2029	EFFECTIVE DATE: 8/14/2025

REVISION/CHANGE LOG

Revision/ Change Letter	Description of Changes	Pages Affected	Date of Revision/Change	Approved By (signature on file)
FR0	Initial FRNP release	All	9/22/2017	Documentation on file
FR1	General Revision	All	1/2/2018	
FR1A	Periodic Review has been completed with no changes identified in procedure technical content. Nonintent change to correct SMA, SME, Approver, and dates has been incorporated per CP3-NS-2001. Date for review cycle has been reset.	All	8/18/2021	
FR1B	Periodic Review has been completed with no changes identified in procedure technical content. Nonintent change to correct FA, SMA, SME, Approver, and dates has been incorporated per CP3-NS-2001. Date for review cycle has been reset.	All	10/25/2022	
FR1C	Intent change based on multiple comments and update sampling requirements.	3-11	4/19/2023	
FR2	Revision to clarify the scope and added Section 6.4 to document additional equipment decontamination to close CAPA-004796. Deleted section on PCB decontamination. Added note boxes for clarification.	All	10/2/2024	
FR2A	Intent change to remove a Source Reference and to delete fissile terms for clarity.	3,4,6,8	8/7/2025	Caleb Kline

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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure establishes methodologies for cleaning and decontaminating sampling equipment and devices that come into contact with non-fissile sample media and/or contaminants. This procedure applies to post-sampling activities only and is **NOT** intended for use during sampling activities. Chg A

The objectives of decontamination are to remove contaminants from surfaces, mitigate the spread of contaminants to other uncontaminated surfaces, prevent cross-contamination of sample matrices, and to minimize personnel exposure and waste volume.

1.2 Scope

This procedure shall be used for decontamination of sampling equipment and devices used for characterization and cleanup verification activities performed by the Deactivation and Remediation (D&R) Contractor personnel, and subcontractor personnel at the U.S. Department of Energy (DOE) owned Paducah site. This procedure is **NOT** intended to provide direction on the decontamination of large field equipment and equipment components.

This procedure shall **NOT** be used to decontaminate any radiological or PCB contaminated equipment or devices. Sampling equipment or devices contaminated with PCBs shall be disposed of according to CP3-WM-0034, *Polychlorinated Biphenyl Spill Management*.

2.0 REFERENCES

2.1 Use References

- CP3-ES-2700, *Sample and Miscellaneous Data Forms*
- CP3-HS-2021, *Emergency Safety Stations and Eyewash Equipment*
- CP3-SM-0019, *Electrical Safety Guidelines*
- CP3-WM-0034, *Polychlorinated Biphenyl Spill Management*
- CP3-WM-1036, *Nuclear Criticality Safety Implementation Requirements for Handling and Storage of Fissile and Potentially Fissile Waste*
- CP3-WM-1037, *Generation and Temporary Storage of Waste Materials*
- CP4-ES-2704, *Trip, Equipment and Field Blank Preparation*
- Equipment or instrument-specific instructions provided by manufacturer

2.2 Source References

- CP2-HS-2000, *Worker Safety and Health Program for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*
- Text Deleted Chg A
- Toxic Substances Control Act, Title 40 Code of Federal Regulations Part 761
- U.S. Army Corps of Engineers, February 2001, EM 200-1-3, *Requirements for the Preparation of Sampling and Analysis Plans*

- U.S. Environmental Protection Agency, June 2024, *Quality System and Technical Procedures for LSASD Field Branches*, Region 4, Athens, GA, https://www.epa.gov/quality/quality-system-and-technical-procedures-lsasd-field-branches
- JHA-24382, *Decontamination of Sampling Equipment and Devices*

3.0 COMMITMENTS

None

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Precautions

4.1.1 Sampling personnel shall comply with additional requirements as described in the Sampling and Analysis Plan/Sampling and Analysis Event Plan (SAP/SAEP) and the radiological work permit (RWP) if required. A two-way radio and/or cell phone at the sampling site during any sampling event for communication purposes shall be maintained. Only intrinsically safe radios, cell phones, etc., shall be used when working in facilities or areas that may contain a potentially explosive atmosphere.

4.1.2 A minimum of two people shall always be present and within visual range of each other at all times during any sampling activity.

4.1.3 Personnel in the decon area shall wear appropriate PPE and use best practice **NOT** to get body and clothing wet.

4.1.4 The requirements established for electrical use shall be followed according to CP3-SM-0019, *Electrical Safety Guidelines.*

4.1.5 The ground may be covered with cloth or other nonskid material, flush and even with the surface, to eliminate or reduce a slipping hazard.

4.1.6 Personnel shall ensure an approved and operational, portable eyewash station with drench hose is within 25 feet or 10 seconds from the work area according to CP3-HS-2021, *Emergency Safety Stations and Eyewash Equipment*.

4.1.7 **If** there are unforeseen circumstances encountered in the work area, **then** Safety & Health/Industrial Hygiene (S&H/IH) must be contacted.

4.1.8 All sampling equipment and devices used during fissile or potentially fissile sampling must be disposed of according to CP3-WM-1036, *Nuclear Criticality Safety Implementation Requirements for Handling and Storage of Fissile and Potentially Fissile Waste* **prior** to entering this procedure. Chg A

4.1.9 Waste generated during decontamination of non-fissile sampling equipment and devices must be handled according to CP3-WM-1037, *Generation and Temporary Storage of Waste Materials.*

4.1.10 Additional cleaning and decontamination procedures and methods may be required because of differing contaminant characteristics.

4.1.11 Posted requirements pertaining to any given sampling location shall be followed.

4.2 Limitations

None

5.0 PREREQUISITES

5.1 Ensure all required decontamination materials are needed and available.

NOTE:

The items listed may be used as a guide, but may **NOT** be a complete list.

5.1.1 Refer to the task-specific SAP/SAEP, if applicable; to determine what instruments, supplies, materials, and equipment are needed to safely execute the decontamination activities.

- Soap (phosphate-free laboratory detergent such as Liquinox®)
- Tap water
- Analyte-free (deionized) water
- Organic- or analyte-free water
- Natural bristle brushes
- Buckets
- Aluminum foil, plastic wrap, zipper-type plastic bags, and clean plastic trash-size bags
- Plastic sheeting or other impermeable liner for decontamination area
- Paper towels, clean cloths, or rags
- Absorbent pads
- Personal protective equipment (PPE)
- Indelible marking pens
- Eyewash Station

5.1.2 Assemble the necessary equipment, tools, and supplies to ensure that sufficient materials and equipment are available for the decontamination activities.

NOTE:

Impermeable plastic sheeting should **NOT** have any seams, rips, or tears.

5.1.3 Place impermeable plastic sheeting on surface to ensure decontamination area is capable of containing all decontamination fluids.

5.1.4 Ensure Radiological Control (RADCON) has surveyed sampling equipment and devices prior to being re-located, **if** needed.

5.1.5 Ensure sawhorses or racks constructed to hold sampling equipment or devices while being decontaminated are high enough above the floor of the decontamination area (for example, at least two feet) to prevent equipment from being splashed.

5.1.6 Refer to the manufacturer's instruction manual before selecting a cleaning or decontamination approach for specific field test equipment or instrumentation (for example, pH meters, thermometers, dissolved oxygen meters) to avoid the possibility of damage to instrument components.

6.0 INSTRUCTIONS

6.1 General Requirements

Sampler

6.1.1 **When** sampling equipment or devices are used to collect samples containing oil, grease or other hard to remove materials, **then** rinse the equipment several times using acetone, hexane, or petroleum ether before proceeding with initial cleaning.

NOTE:

Sampling equipment and devices may be cleaned with soap and hot water as an alternative to brushing if appropriate and necessary.

Sampling equipment and devices that are cleaned with soap and hot water should be placed on racks or saw horses at the decontamination area.

6.1.2 Clean sampling equipment or devices with tap water and soap using a brush to remove particulate matter and surface films.

6.1.3 Rinse sampling equipment or devices thoroughly with tap water.

6.1.4 Rinse sampling equipment and devices thoroughly with analyte-free water.

NOTE:

A final rinse with analyte-free water is **NOT** used following a rinse with organic or analyte-free water.

A. **After** solvent rinse, **then** rinse sampling equipment and devices with an organic or analyte-free water **and** air dry.

B. **If** organic or analyte-free water is **NOT** available, **then** allow sampling equipment and devices to completely air dry.

C. Text deleted. Chg A

D. Handle non-fissile decontamination waste according to CP3-WM-1037.

6.1.5 Handle decontaminated sampling equipment and devices wearing clean, nitrile, or other approved gloves by S&H/IH to prevent recontamination.

6.1.6 Store new or cleaned (decontaminated) sampling equipment and devices separately from contaminated equipment.

6.1.7 Label contaminated sampling equipment and devices that have been placed into bags for storage.

6.1.8 **If** necessary, **then** prepare equipment rinsate blanks according to CP4-ES-2704, *Trip, Equipment and Field Blank Preparation*.

6.1.9 Document any deviations or difficulties encountered in the field concerning sample collection or related activities according to CP3-ES-2700, *Sample and Miscellaneous Data Forms*.

6.2 Well Sounder, Tape, or Pressure Transducer/Data Logger (Separate or Self-Contained) Decontamination

NOTE:

Pressure transducer/data logger (separate or self-contained) includes cleaning of cable and transducer or self-contained data logger and pressure or level sensor.

Only the portion of the well sounder cable or tape that has a potential to come into contact with contamination needs to be cleaned.

Sampler

6.2.1 Wash with soap and tap water.

6.2.2 Rinse with tap water.

6.2.3 Rinse with analyte-free water **and** air dry.

6.2.4 **If** sampling equipment is used in a radiological area, **then** contact RADCON to survey equipment, as required.

6.2.5 Handle decontaminated measuring equipment and devices wearing clean, nitrile or other approved gloves by S&H/IH to prevent recontamination.

6.3 Pump Decontamination

Sampler

NOTE:

Pump decontamination **ONLY** applies to non-dedicated pumps and is **NOT** intended for dedicated pumps used in groundwater monitoring wells.

CAUTION:

In order to avoid damage to pumps or other devices operated by a controller, the controller must **NOT** become wet during cleaning and decontamination activities.

6.3.1 Pump soapy water through the hose to flush out any residual purge water.

6.3.2 Scrub the exterior of the contaminated hose, pump, and electrical cord, with soap and tap water, using a brush or wipe.

6.3.3 Rinse the soap from the outside of the hose, pump, and electrical cord with tap water.

6.3.4 Rinse the hose with analyte-free water.

6.3.5 Pump tap water through the hose to flush out soapy water (approximately 1 gallon).

6.3.6 Pump analyte-free water through the hose to flush out the tap water.

6.3.7 **If** the pump has a reverse mode, **then** purge with the pump in reverse mode.

6.3.8 Rinse the tap water residue from the outside of hose, pump, and electrical cord with analyte-free water (approximately ¼ gallon) **and** let dry.

6.3.9 **If** sampling equipment is used in a radiological area, **then** contact RADCON to survey before tagging and labeling, as required.

6.3.10 Handle decontaminated measuring equipment and devices wearing clean, nitrile or other approved gloves by S&H/IH to prevent recontamination.

6.3.11 Tag **and** label equipment.

6.4 Sampling Flow Control Box

Sampler

6.4.1 Connect sampling flow control box to deionized water system.

6.4.2 Pass deionized water through the sampling flow control box for 15 to 20 minutes.

6.4.3 Disconnect sampling flow control box from the deionized water system.

6.4.4 **If** sampling equipment is used in a radiological area, **then** contact RADCON to survey equipment, as required.

6.4.5 Handle decontaminated measuring equipment and devices wearing clean, nitrile or other approved gloves by S&H/IH to prevent recontamination.

7.0 ACCEPTANCE CRITERIA

None

8.0 POST PERFORMANCE WORK ACTIVITIES

Sampler

8.1.1 Record all decontamination activities on the CP4-ES-2702-F01, *Decontamination Log*.

8.1.2 Ensure sampling equipment and devices used in radiological areas are surveyed by RADCON after decontamination.

NOTE:

Decontaminated sampling equipment and devices may be wrapped in aluminum foil or plastic.

Sampler

8.1.3 Handle disposable sampling equipment, devices, plastic sheeting and decontamination waste according to the requirements in CP3-WM-1037 for non-fissile waste. Chg A

9.0 RECORDS

9.1 Records Generated

The following records may be generated by this procedure:

CP4-ES-2702-F01, *Decontamination Log*

Forms are to be completed according to CP3-OP-0024, *Forms Control*.

9.2 Records Disposition

The records are to be maintained according to CP3-RD-0010, *Records Management Process*.

Appendix A – Acronyms/Definitions

ACRONYMS

CSE – contaminated sampling equipment

D&R - Deactivation and Remediation

DOE - U.S. Department of Energy

PPE – personal protective equipment

PPM – part per million

RADCON-Radiological Control

RWP – radiological work permit

SAP/SAEP - sampling and analysis plan/sampling and analysis event plan

DEFINITIONS

Analyte-Free (Deionized) Water – Tap water treated by passing through a standard deionizing resin column. It should contain **NO** detectable heavy metals or other inorganic compounds at or above method detection limits as defined by a standard inductively coupled Argon Plasma Spectrophotometer (or equivalent) scan.

Drench Hose – A supplemental device consisting of a flexible hose connected to a flushing fluid supply and used to provide fluid to irrigate and flush face and body areas.

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

Organic-/Analyte-Free Water – Tap water treated with activated carbon and deionizing units. At a minimum, it must meet the analytical criteria of analyte-free water and should contain **NO** detectable pesticides, herbicides, or extractable organic compounds, and **NO** volatile organic compounds above minimum detectable levels as determined by the U.S. Environmental Protection Agency Region 4 laboratory for a given set of analyses.

PCB CSE (contaminated sampling equipment) – Any equipment to be reused that is suspected to have come in contact with PCB- labeled material and/or a PCB source 2 to 50 ppm (part per million).

Tap Water – Water from any municipal water treatment system. Untreated potable water is **NOT** an acceptable substitute for tap water.

CP4-ES-2702-F01 – DECONTAMINATION LOG SHEET

DECONTAMINATION LOG

Date/Time	Name/Badge#	Equipment	Field and Lab Decon Description