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FUNCTIONAL AREA: Characterization (Sampling/Lab) **SUBJECT MATTER AREA:** Characterization	**SUBJECT MATTER EXPERT**: Chris Skinner, Characterization Sampling Lead
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REVISION/CHANGE LOG

Revision/Change Letter	Description of Changes	Pages Affected	Date of Revision/Change
FR0	Initial FRNP release	All	10/10/17
FR1	General revision	All	1/9/18
FR1A	Non-intent change to correct SME and approver. Updated required review date.	All	4/27/21
FR1B	Non-intent change for clarifications and corrections in Section 6.6 (6.6.4, 6.6.8, 6.6.13)	9	6/2/2021
FR2	General Revision with the addition of section 6.9, Sampling of Microbial Induced Corrosion. Incorporated hazards and controls from JHA throughout procedure identified in Periodic Review.	All	5/25/2022
FR2A	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 reset.	All	10/6/2022
FC1	Change to address RADCON requirements for off-site shipment.	14	02/27/2023
FR2B	Intent change to incorporate Field Change 1 to steps 7.3 and 7.4	14	03/07/2023
FR2C	Change to add the use reference for PFAS sampling guidance and to consult the guidance as a prerequisite step.	3, 6	03-16/2023
FR3	Revision to incorporate multiple comments	All	4/19/2023
FR3A	Intent Change to incorporate the use of Compressed Air instead of Nitrogen for Groundwater Sampling.	9, 13-14	02/14/2024

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1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure describes the requirements for groundwater sampling.

1.2 Scope

This procedure shall be used by the Deactivation & Remediation (D&R) Contract personnel, and subcontractor personnel that perform sampling of groundwater monitoring wells and residential wells as described in the Environmental Monitoring Plan (EMP), at the U.S. Department of Energy (DOE)-owned Paducah site.

2.0 REFERENCES

2.1 Use References

- CP3-ES-0003, *Environmental Incident Reporting*
- CP3-ES-0043, *Temperature Control for Sample Storage*
- CP3-ES-2708, *Chain-of-Custody Forms, Field Sample Logs, Sample Labels, and Custody Seals*
- CP3-WM-1037, *Generation and Temporary Storage of Waste Materials*
- CP3-WM-9503, *Off-Site Shipments by Air Transport*
- CP4-ES-2100, *Groundwater Level Measurement*
- CP4-ES-2700, *Logbooks and Data Forms*
- CP4-ES-2702, *Decontamination of Sampling Equipment and Devices*
- CP4-ES-2704, *Trip, Equipment, and Field Blank Preparation*
- CP4-ES-0109, *Calibration and Preventative Maintenance of Laboratory Equipment*
- CP4-ES-2702, *Decontamination of Sampling Equipment and Devices*
- CP5-TS-1000, *Per- and Polyfluoroalkyl Substances Sampling Guidelines* (PFAS)

2.2 Source References

- CP2-ES-0006, *Environmental Monitoring Plan Fiscal Year 2023 Paducah Gaseous Diffusion Plant, Paducah, Kentucky*
- CP2-HS-2000, *Worker Safety and Health Program for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*
- JHA-10903, *Monitoring Well Sampling and Water Level Data Collection*

3.0 COMMITMENTS

None

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Precautions

4.1.1 A minimum of two people shall be present and within visual range of each other at all times during any measurement.

4.1.2 Personnel shall exercise caution when unlocking and opening wells known or suspected to be under pressure, or contain insect nests.

4.1.3 Approved safety glasses shall be worn when sampling activities are being performed.

4.1.4 Approved eye wash station will be available for employees when chemicals are being used that have the potential to come in contact with the employees eyes.

4.1.5 Cut resistant gloves shall be worn when handling materials that may cause cuts or abrasions.

4.1.6 Nitrile rubber gloves shall be worn when using sample bottles with prepackaged acid present.

4.1.7 **If** any Hydrochloric Acid, Nitric Acid or Sulfuric Acid comes in contact with nitrile gloves **then** gloves shall be removed, disposed of and a new pair obtained.

4.1.8 Personnel shall inspect vault doors to determine pinch points that need to be guarded or eliminated and shall ensure well vault doors are secured with a safety latch prior to entering the vault.

4.1.9 A two-way radio and/or cell phone shall be kept at the sampling site during any sampling event for communication purposes and when working in facilities or areas that may contain a potentially explosive atmosphere, then only intrinsically safe radios, cell phones, etc. shall be used.

4.1.10 Personnel shall contact Waste Management for proper management and/or storage of waste and ensure hazardous and non-hazardous waste is segregated.

4.1.11 Personnel shall be aware of the potential for chemical hazards in the area and shall evacuate the area and notify supervision if they suspect chemical exposure, such as: strange smell, vapor cloud, burning or itching sensation, spill of unknown liquid, or broken lines or damage to equipment that may contain hazardous chemicals.

4.1.12 Personnel shall be familiar with the hazards associated with exposure to Volatile Organic Compounds (VOCs), specifically, trichloroethylene (TCE) and vinyl chloride.

4.1.13 Personnel shall wear Supreno EC Microflex Nitrile gloves or Showa 730 gloves when handling TCE contaminated equipment, liquid, or soil.

4.1.14 Industrial Hygiene (IH) shall periodically monitor for VOC during groundwater level measurement activities. Coordinate with IH to identify when monitoring for VOCs is required.

A. A sustained instrument response at or above the Breathing Zone (BZ) action limit shall require a work pause with Personnel leaving the area and notification to the IH Program Manager and Industrial Safety (IS)/IH Supervisor.

4.1.15 Respiratory protection shall be required when sampling wells where direct read BZ monitoring detects sustained exposure levels greater than the action limits or data shows exposure levels at or above action limits.

4.1.16 Any spills and/or releases shall be reported according to CP3-ES-0003, *Environmental Incident Reporting*.

4.1.17 Contaminants shall **NOT** be introduced into the well that would compromise the quality of the groundwater.

4.2 Limitations

4.2.1 Instruments and equipment shall be decontaminated according to CP4-ES-2702, *Decontamination of Sampling Equipment and Devices*, ready for use, and shall be protected from sources of contamination (for example, wrapped in aluminum foil, sealed in plastic or other storage containers, placed on plastic sheeting in staging area) during transport to the location and during field activities.

4.2.2 Project specific information shall be documented in logbooks according to CP4-ES-2700, *Logbooks and Data Forms* or on sample data forms at the start of a sampling event and at the time of sample collection. Applicable data that is entered into Project Environmental Measurements System (PEMS) is documented on Chain of Custodies (COCs) and/or sample data forms.

4.2.3 The breakthrough time of Supreno EC Microflex Nitrile gloves is 2 hours for TCE. Personnel shall **NOT** use Supreno EC Microflex Nitrile gloves for more than 2 hours after contact with TCE contaminated liquid or soil.

4.2.4 The breakthrough time of Showa 730 gloves is 4 hours for TCE. Personnel shall **NOT** use Showa 730 gloves for more than 4 hours after contact with TCE contaminated liquid or soil.

4.2.5 The following Occupational Exposure Limits for TCE shall apply:

- 8 hour Time Weighted Average (TWA) = 10 ppm
- 10 hour TWA= 7 ppm
- Action Limit = 5 ppm
- Short Term Exposure Limit = 25 ppm

4.2.6 Groundwater sampling shall be performed by individuals whose primary responsibilities are to inspect monitoring wells (MWs) and collect groundwater samples and groundwater level data, and are familiar with the design and construction aspects of the monitoring well.

NOTES:

Stabilization parameters include pH, specific conductance, dissolved oxygen, temperature, and turbidity.

Water quality parameters have stabilized when measurements of the parameters vary within approximately 10percent over the last two consecutive measurements that are three minutes apart.

Turbidity measurements are considered stabilized when subsequent results vary within approximately 10 percent or turbidity measurements are approximately 10 Nephelometric Turbidity Units or less.

4.2.7 Groundwater samples are collected as soon as possible after the well is purged and water quality parameters have stabilized.

NOTE:

Maintaining a drawdown of 0.3 ft. or less is typically **NOT** possible in Upper Continental Recharge System wells.

4.2.8 **When** pumping groundwater, **then** discharge rate shall be controlled to maintain a water level drawdown of less than 0.3 feet, if possible.

5.0 PREREQUISITES

5.1.1 **If** required, **then** read **and** sign off on the Radiological Work Permit (RWP).

5.1.2 Ensure the following:

- Instruments and equipment are decontaminated and ready for use according to CP4-ES-2702, *Decontamination of Sampling Equipment and Devices*.
- Equipment is labeled with calibration date.

5.1.3 **If** required, **then** notify RADCON and Safety & Health personnel before initiating sampling to determine required surveys and monitoring requirements for RWP and IH Work Permit.

5.1.4 Obtain COCs, sample data forms, and sample labels as necessary from Sample Management Office (SMO).

5.1.5 Ensure sampling operations are documented on MW groundwater data forms according to CP4-ES-2700, *Logbooks and Data Forms.*

5.1.6 Calibrate **and** perform operational check on the Water Quality Meter prior to collecting field measurements according to CP3-ES-0109, *Calibration and Preventative Maintenance of Laboratory Equipment*.

5.1.7 Perform a visual inspection of the trailer, if used, and all field equipment, before each use for safety and operability.

5.1.8 Prepare the necessary sample containers **and** attach sample labels.

5.1.9 Prepare necessary field quality control samples according to CP4-ES-2704, *Trip, Equipment, and Field Blank Preparation*.

5.1.10 **If** collecting samples for PFAS parameters, **then** consult sampling guidelines discussed in CP5-TS-1000, *Per- and Polyfluoroalkyl Substances Sampling Guidelines.*

6.0 INSTRUCTIONS

6.1 Calculation of Purge Volumes

NOTE:

The PEMS report and/or sample data forms that accompany the sample labels, may document the required purge volume to be used for the wells equipped with a bladder pump.

The required purge volume may be calculated from the well depth and the inner diameter of the discharge line.

The required purge volume is calculated if the information is not included in the PEMS report and/or sample data form.

Sampler

6.1.1 **If** the required purge volume and/or well depth is **NOT** included on the sample data form, **then** contact the Contract Technical Representative (CTR).

A. Receive purge volume or well depth from the CTR.

B. **If** given well depth, **then** calculate the purge volume by multiplying 40 ml for every foot of well depth where 1/2" discharge line is present or 22 ml for every foot of well depth where 3/8" discharge line is present **and** adding 450 milliliters (ml) for the pump.

C. **If** given well depth for multiport wells equipped with ¼" tubing, **then** calculate the purge volume by multiplying 10 ml for every foot of well depth where ¼" discharge line is present. No volume should be added for a pump (which is **NOT** present).

6.1.2 Record the required purge volume on the sample data form.

6.2 Groundwater Sampling Using Bladder Pumps

6.2.1 Upon arriving at the sampling site, inspect the site/well for damage or unusual circumstances such as tampering, vandalism, etc.

6.2.2 **If** purge volume is **NOT** provide on the sample data form, **then** calculate the purge volume for the well according to section 6.1.

6.2.3 Open the well cap or lid **and** note any damage or unusual conditions of the well casing, cap, airline, and fittings for the discharge tube.

6.2.4 **If** any damage is observed, **then** record the damage or unusual circumstances on sample data forms and/or COC **and** contact supervision.

6.2.5 Retrieve the discharge tubing from the well **and** connect to the well head.

6.2.6 **If** the discharge tubing comes in contact with the ground, **then** decontaminate the tubing with deionized water and a clean moist wipe before placing back into the well.

6.2.7 Place insulation on the discharge tube.

6.2.8 Connect the discharge tubing from the well head to the sampling flow control box.

6.2.9 Connect the pump cycle control box air hose to well head air fittings.

6.2.10 Uncap compressed air cylinder tank, if used, **and** attach regulator. Chg A

6.2.11 Adjust the regulator, **if** required.

6.2.12 Attach the air hose to the regulator.

6.2.13 Attach air hose to pump cycle control box.

6.2.14 Position the water quality meter on the portable sampling flow control box **or** other appropriate location.

6.2.15 Measure **and** record the static water level on the sample data form according to CP4-ES-2100, *Groundwater Level Measurement*.

NOTE:
Purging three-well-volumes without a packer is only used at the direction of supervision.

6.2.16 Perform the following when purging groundwater using bladder pumps:

A. **When** Micropurging, **then** record the beginning water level **and** ending water level after sampling is complete.

B. **If** sampling flow control box is used, **then** open the valve on the sampling flow control box to direct the flow of purge water to the sample port. **If** sampling flow control box is **NOT** used, **then** document the reason on the sample data form.

C. Open the valve on the compressed air tank regulator **or** start the air compressor, if used, **and** open the regulator. Chg A

NOTE:
The flow controller pressure output should be set less than 100 psi.

D. Turn on the pump cycle control box and adjust the flow controller to the desired pressure output.

E. Record purge start time on sample data form.

F. Adjust flow with flow controller on the sample flow control box to produce a flow rate of 300 mL/min or less per pump cycle and allow 300 mL or more to flow through the sampling port.

G. Close the sampling port to direct the flow of purge water through the water quality meter flow-through cell.

H. Check for trapped air pockets in the flow-through cell and reposition, as necessary, to remove any trapped air.

I. At a minimum, pump the purge volume determined in Section **6.1 and** record purge end time on sample data form before monitoring the water quality parameters.

J. **When** the purge volume has been reached, **then** record the initial water quality parameter readings on the sample data form and/or COC.

K. Record a minimum of three measurements, including the initial reading, in three-minute intervals until stability has been achieved.

NOTES:

Groundwater samples are collected as soon as possible after the well is purged and water quality parameters have stabilized.

The reading for Eh (approx.) is documented but **NOT** used to determine stabilization.

L. Adjust the valves to direct the flow through the sample port and to isolate water within the flow-through cell from the sample port.

NOTES:

The sample flow rate is maintained at 300 ml/min or less except for sampling of VOCs, which is maintained at a flow rate of 100 ml/min or less.

6.2.17 Perform the following when collecting samples using bladder pumps:

A. **If** sampling for PFAS, **then** use guidance in CP5-TS-1000 **and** do **NOT** label sample bottles.

B. Before filling bottles, label sample bottles with date and sampler's initials.

C. Collect samples for the required analytes.

D. **If** sampling for VOCs, **then** ensure that a meniscus is raised above the lip of the VOC vial before capping, ensuring NO headspace.

1. After closing VOC vial, invert **and** tap lightly to check for air bubbles.

2. **If** air bubbles are present, **then** re-open container **and** add additional sample.

E. Collect required field quality control samples.

F. Measure water level after sampling **and** record level on the sample data form.

G. **If** a well is purged to dryness, **then** return to the well after 24 hours of the initial sampling time **and** attempt to collect one round of water quality parameters, **then** collect the required sample.

H. **If** the well pumps dry during the second sampling event, **then** abandon the remaining sample collection requirements for the well **and** consider the well dry.

6.3 Groundwater Sampling of Residential Wells

NOTES:

A minimum of 2 project personnel are present during sampling of residential wells unless otherwise directed by supervision.

Residential wells are on private property and are equipped with either a bladder pump or an electric pump.

Purge water from the bladder pump residential wells is containerized.

Purge water from the electric pump residential wells (i.e. faucet locations) is **NOT** containerized.

6.3.1 **If** residential well is equipped with a bladder pump, **then** follow Section **6.2** for sampling residential well.

6.3.2 **If** residential well is equipped with an electric pump, **then:**

A. Connect hose to an outside faucet.

B. Open the valve fully to receive the highest purge rate **and** continue this purge rate for a minimum of on 5 minutes. Record the purge start and end time on the sample data form.

C. After purging for a minimum of 5 minutes, reduce the water flow and connect the water quality meter to the water faucet hose.

D. Check for trapped air pockets in the flow-through cell and reposition, as necessary, to remove any trapped air.

E. After purging a minimum of 5 minutes through the flow-through cell, record the initial water quality parameter readings on the sample data form and/or COC.

F. Record a minimum of three measurements, including the initial reading, in three-minute intervals until stability has been achieved.

G. Close the faucet valve and remove water faucet hose from faucet.

NOTE:

Sample flow rate for VOCs is maintained at 100 ml/minute or less.

H. Reopen faucet valve and reduce the water flow rate to approximately 300 ml/min or less during collection of samples.

I. Collect samples for the required analytes.

J. **If** sampling for VOCs, **then** ensure that a meniscus is raised above the lip of the VOC vial before capping, ensuring NO headspace.

1. After closing VOC vial, invert **and** tap lightly to check for air bubbles.

2. **If** air bubbles are present, **then** re-open container **and** add additional sample.

K. Collect required field quality control samples.

L. Close the faucet valve once all sampling is complete.

6.4 Groundwater Sampling of Residential Wells Carbon Filtration System

6.4.1 Upon arriving at the sampling site, inspect the site/well for damage or unusual circumstances such as tampering, vandalism, etc.

6.4.2 **If** any damage is observed, **then** record the damage or unusual circumstances on sample data forms and/or COC **and** contact supervision.

6.4.3 Identify all required sampling ports.

6.4.4 Locate **and** fully submerge sample ports in a cup of bleach for approximately 1 minute.

6.4.5 Remove from bleach and connect an appropriate length of ¼" Teflon tubing to sample port.

6.4.6 Open sample port fully to receive the highest purge rate and continue this purge rate for a minimum of 5 minutes. Record the purge start and end times on the sample data form.

6.4.7 **After** purging for a minimum of 5 minutes, reduce the water flow **and** connect the water quality meter to the Teflon tubing.

6.4.8 Record required field readings on the sample data form and/or COC after the initial purge volume has been pumped from port 1.

6.4.9 Close sample port **and** disconnect Teflon tubing from the water quality meter.

NOTE:
Sample flow rate for VOCs is maintained at 100 ml/minute or less.

6.4.10 Open sample port to a flow rate of approximately 300ml/min or less during collection of sample

6.4.11 Collect sample for the required analytes.

6.4.12 **If** sampling for VOCs, **then** ensure that a meniscus is raised above the lip of the container before capping, ensuring NO headspace.

A. After closing VOC vial, invert **and** tap lightly to check for air bubbles.

B. **If** air bubbles are present, **then** re-open container **and** add additional sample.

6.4.13 Collect required field quality control samples.

NOTE:
Field readings may **NOT** be required for the sampling of port 3.

6.4.14 Locate sample port 3 **and** perform steps **6.4.4** through **6.4.12** then exit this section.

6.5 Sampling of Multi-Port Wells

6.5.1 Upon arriving at the sampling site, inspect the site/well for damage or unusual circumstances such as tampering, vandalism, etc.

6.5.2 **If** purge volume is **NOT** provide on the sample data form, **then** calculate the purge volume for the well according to section **6.1**.

6.5.3 Open the well cap or lid **and** note any damage or unusual conditions of the well casing, cap, airline, and fittings for the discharge tube.

6.5.4 **If** any damage is observed, **then** record any damage or unusual circumstances on sample data forms and/or COC **and** contact supervision.

6.5.5 Position the water quality meter and the pump controller box on the portable sampling table or other appropriate location.

6.5.6 Uncap the compressed air cylinder tank **and** attach the regulator **or** use compressed gas. Chg A

6.5.7 Attach the air hose to the regulator.

6.5.8 Attach the air hose to the control box Air Inlet.

6.5.9 Connect the auxiliary airline to the Main Air Outlet on the controller box.

6.5.10 Connect the other end of the auxiliary airline to the airline connection fitting on the well head.

6.5.11 Connect the desired sample port discharge line to the water quality meter flow through cell.

6.5.12 Open the sample port that corresponds with the attached discharge line.

6.5.13 Operate the pump cycle control box in manual drive to achieve optimum flow rate through the flow through cell.

6.5.14 At a minimum, pump the purge volume determined in Section **6.1** and record purge end time on sample data form before monitoring the water quality parameters.

6.5.15 Allow the flow through cell to fill completely **and** record the required water quality parameter readings on the sample data form and/or COC.

6.5.16 Collect discharge from the water quality meter in an appropriate waste container.

NOTES:

If unable to achieve water quality stabilization of groundwater from a sampling port of a multiport well, **then** supervision is notified.

The water quality parameters include pH, specific conductance, dissolved oxygen, temperature, and turbidity.

The reading for Eh (approx.) is documented, although **NOT** used to determine stabilization.

6.5.17 Record a minimum of three measurements on the sample data form and/or COC, including the initial reading, in three-minute intervals **until** water quality stability has been achieved.

6.5.18 Once stabilization has been achieved, detach the port discharge line from the water quality meter **and** collect required well samples.

NOTE:

Sample flow rate for VOCs is maintained at 100 ml/minute or less.

6.5.19 **If** sampling for VOCs, **then** ensure that a meniscus is raised above the lip of the VOC vial before capping, ensuring NO headspace.

A. After closing VOC vial, invert **and** tap lightly to check for air bubbles.

B. **If** air bubbles are present, **then** re-open container **and** add additional sample.

6.5.20 Collect required field quality control samples.

6.5.21 **After** sample collection close the sample port.

6.5.22 Repeat steps **6.5.11** through **6.5.2121** as required for each port to be sampled.

6.5.23 **After** completion of sampling, turn off the compressed air supply regulator **and** disconnect all air lines to and from the pump controller box and the well head. Chg A

6.5.24 Replace the well cap on the well.

6.6 Groundwater Sampling of Northwest Plume or Northeast Plume Extraction Wells

6.6.1 Upon arriving at the sampling site, inspect the site/well for damage or unusual circumstances such as tampering, vandalism, etc.

6.6.2 **If** any damage is observed, **then** record any damage or unusual circumstances on sample data form and/or COC and contact supervision.

NOTE:

Documentation of stable water quality conditions is **NOT** required at Northwest/Northeast Pump and Treat wells.

6.6.3 **Before** sampling, purge a minimum of 2 liters of water from the sampling port **and** record the purge start time and end time on the sample data form.

6.6.4 Reduce the water flow rate to approximately 300 ml/min or less during sampling.

6.6.5 Collect samples for the required analytes in the appropriate order.

NOTE:

Sample flow rate for VOCs is maintained at 100 ml/min or less.

6.6.6 **If** sampling for VOCs, **then** ensure that a meniscus is raised above the lip of the container before capping, ensuring NO headspace.

A. After closing VOC vial, invert **and** tap lightly to check for air bubbles.

B. **If** air bubbles are present, **then** re-open container **and** add additional sample.

6.6.7 Collect required field quality control samples.

6.6.8 Return purge water from the Northeast Pump and Treat extraction wells and Northwest Pump and Treat extraction wells to the sump of the sampled well.

6.7 Post-Sampling Activities for Ground Water Samples

6.7.1 Record the barometric pressure from National Weather Service Office at Barkley Regional Airport website for wells where water level depth is measured.

6.7.2 Decontaminate sampling equipment according to CP4-ES-2702 **and** record the decontamination event on CP4-ES-2702 F01.

6.7.3 Complete COC and MW groundwater data forms according to CP3-ES-2708, *Chain-of-Custody Forms, Field Sample Logs, Sample Labels, and Custody Seals.*

6.7.4 Drain all purge water from the water quality meter, sampling flow control box, and discharge tubing into the waste container on the sample trailer.

6.7.5 Record purge water volume collected in the waste container on the container log sheet and the MW groundwater data form.

NOTES:

Well purge water is transported to the storage facility at the end of every shift.

The sampling flow control box is decontaminated by rinsing with a minimum of 300 mL of analyte-free water through the sampling port on the sampling flow control box.

6.7.6 Thoroughly decontaminate the sampling flow control box and water level meter **and** record the decontamination event and time.

6.7.7 Disconnect the pump cycle control box from the well head, replace discharge tubing into well, **and** lock the well cap.

6.7.8 Transport the purge water waste container to the storage facility.

6.7.9 Record purge water volume collected in the waste container on the container log sheet and the MW groundwater data form.

6.7.10 Handle waste generated during groundwater sampling according to CP3-WM-1037, *Generation and Temporary Storage of Waste Materials.*

6.8 Sampling of Microbial Induced Corrosion

6.8.1 Examine apparatus (i.e. pump and motor) for corrosion.

6.8.2 **If** there is no corrosion, **then** exit section **and** sample will **NOT** be taken.

6.8.3 **If** apparatus has corrosion spots, **then** examine to see if there is biofilm **or** corrosion layer on the apparatus over the corrosion spot.

6.8.4 **If** layer is over corrosion spot, **then** scrape metal to obtain liquid under the layer.

6.8.5 **If** enough liquid exists, **then** use pH paper to determine the pH of the liquid under the layer **and** record pH on sample data form and/or COC.

6.8.6 Swab the corrosion spot.

6.8.7 Place the swab in container.

6.9 Post-Sampling Activities

6.9.1 Complete the COCs and sample labels according to CP3-ES-2708.

6.9.2 Ensure sample information is documented according to CP4-ES-2700, *Logbooks and Data Forms* on sample data forms and/or COC.

6.9.3 Inspect reusable sampling equipment to ensure gross quantities of sample material have been removed.

6.9.4 **If** gross quantities of sample material can **NOT** be removed from the reusable sampling equipment, **then** handle the reusable sampling equipment as non-fissile waste according to CP3-WM-1037, *Generation and Temporary Storage of Waste Materials*.

6.9.5 Decontaminate sampling equipment according to CP4-ES-2702 **and** record the decontamination event on CP4-ES-2702 F01.

6.9.6 Dispose of all waste generated from sampling activities according to CP3-WM-1037.

7.0 ACCEPTANCE CRITERIA

None

8.0 POST PERFORMANCE WORK ACTIVITIES

8.1.1 Maintain custody of the samples according to CP3-ES-2708 until samples are transferred to the designated laboratory for analysis as soon as possible.

8.1.2 **If** preservation of sample requires refrigeration **then** refrigerate samples.

8.1.3 Ensure that the temperature of the sample(s) is maintained according to CP3-ES-0043, *Temperature Control for Sample Storage*.

8.1.4 **If** samples contain radiological material, **then** coordinate with RADCON, **and** handle according to CP3-WM-9503, *Off-Site Shipments by Air Transport*.

8.1.5 Prepare samples for shipment off-site and ship according to CP3-WM-9503.

8.1.6 Submit a copy of the COCs and logbook pages and/or sample data forms to the SMO for entry into PEMS.

8.1.7 **If** unused or excess sample material is received from the off-site laboratory, **then** dispose of sample material into accumulation containers according to CP3-WM-1037.

9.0 RECORDS

9.1 Records Generated

The following records may be generated by this procedure:

- Data Form Entries
- Logbook Entries

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

BZ – Breathing Zone

CF – Casing Factor

COC- Chain-of-Custody

CTR – Contract Technical Representative

D&R - Deactivation & Remediation

DOE - U.S. Department of Energy

IH- Industrial Hygiene

IS- Industrial Safety

JHA – Job Hazard Analysis

ml/min – milliliters per minute

MW – Monitoring Wells

ORP – Oxidation Reduction Potential

PD – Packer Depth

PEMS – Paducah Environmental Management System

RWP - Radiological Work Permit

SMO - Sample Management Office

TCE– Trichloroethylene

TWA– Time Weighted Average

VOC – Volatile Organic Compounds

WD – Well Depth

DEFINITIONS

Monitoring Well – Any well intended to be used either to collect water samples for purposes of water quality testing, or to measure groundwater levels. A piezometer is a type of monitoring well which measures the pressure (more precisely, the piezometric head) of groundwater at a specific point.

Micropurge – minimum volume of purge calculated based on the pump volume and length and diameter of tubing in the discharge line