EXCAVATION OF HOTSPOT FROM SPILL ON 02/01/57
OF UNKNOWN SEEPAGE BASIN PIPE LEAK
FROM 904-44G (NBN) – SRS INDEX 225

Minor
Operations and Maintenance Plan

Spill on 02/01/57 of Unknown Seepage Basin Pipe Leak from 904-44G (NBN)

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INTRODUCTION

This Operations and Maintenance (O&M) Plan is for the excavation of a known soil "hotspot" containing Cs-137 (~6 pCi/g) located off the northeast corner of the H-Area Seepage Basin 1, (904-44G). This excavation will be within SRS Index (SI) 225 (Spill on 02/01/57 of Unknown Seepage Basin Pipe Leak from 904-44G) of the Federal Facility Agreement (FFA, Reference 1).

The soil excavation area for this activity will not exceed 10 percent of the surface area that comprises SI 225. The plan is categorized as a "minor intrusive activity" based on the soil excavation meeting the definition of both "minor" and "intrusive" in Reference 2. The purpose of the excavation is to remove surface soil exceeding acceptable background levels for routine worker protection in support of long-term post-closure care grounds maintenance in this area. Soil data will be collected prior to excavation activities as defined in Attachment 2. The soil data and the final post-excavation condition will be used in the addendum to the site evaluation report for the 904-44G Spill Release Area (SRNS-RP-2023-00689 – currently in draft form) to recalculate and document the post-excavation decay-corrected risk for this area defined as SRS Index 225. The risk recalculation results will be used to establish the administrative path forward for this area as documented in the FFA.

AREA DESCRIPTION AND CONDITIONS

This excavation is located just south of the intersection of Road E and Road 4, between Road 4 and the eastern side of the Seepage Basin 904-44G (which was formerly identified as H-Area Seepage Basin #1) (see Attachment 1). This unit was originally identified because of a release of contaminated process wastewater from the H-Area Seepage Basin #1 that was discovered on 2/8/57, impacting about 100 feet of an adjacent ditch leading to Road 4, and then approximately 200 feet of the Road 4 drainage ditch. The area in which the activity will be conducted is located adjacent to the H-Area Hazardous Waste Management Facility (HWMF) cap/cover system (closed under a RCRA closure action in the early 1990's) and is within the H-Area HWMF coverage area for corrective action, post closure care, and the groundwater monitoring well network (including the point of compliance [POC] wells). Due to the proximity of this area to the cover system, routine ground maintenance in support of the H-Area HWMF will be long-term.

An inactive 4-inch diameter H-Area groundwater remediation pipe (installed in the late 1990's) traverses through the release area at a depth $\geq$2.5-feet below ground surface (see drawing P-PA-H-8374). According to drawing C-CT-H-7824, 6-inch-wide yellow metallic detection tape was installed 12-inches above the pipe. This inactive pipe transferred H-Area tritiated groundwater from the extraction wells collection tank (building 782-8G) to the H-Area groundwater treatment facility but was shut down in the early 2000's. This inactive pipe is classified as abandoned in place on Site Development and Control drawings. A direct buried fiber optic control cable also traverses through the release area. On Site Development and Control drawings, the control cable is collocated with the remediation pipe at the release area. This cable runs between the inactive extraction wells collection tank (782-8G) and the decommissioned H-Area groundwater treatment facility control room (782-10G). The depth of the control cable is unknown.

In 2002, the site evaluation program collected soil data at 25 locations to investigate the 904-44G release area. A preliminary risk evaluation indicated surface soil (0 – 1 foot interval) at only one location contained levels of Cs-137 above the SRS background concentration. The concentration of Cs-137 at the "hot spot", decay corrected to year 2023, is 6.3 pCi/g. The SRS background concentration for Cs-137 due to fallout from weapons testing is < 1 pCi/g.

O&M ACTIVITY

O&M Activity Description

The scope of the activity is as follows:

1) Define the area of excavation using the attached soil sampling strategy.
2) Locate and mark the hot spot coordinate (sample location 10) listed in Attachment 2, Table 1, with the use of a land survey.
3) Identify the perimeter sample locations using the coordinates listed in Attachment 2, Table 1.
4) Obtain soil samples to validate clean perimeter boundary (see Attachment 2 for sampling details).
5) Establish boundary shown in Attachment 2, Figure 2, with the use of a land survey.
6) Excavate to a depth of 1 foot within perimeter boundary.
7) Containerize, certify, and dispose of excavated soil as Low-Level Waste (LLW) at the E-Area Slit Trenches per the 1S Manual. (Note: sample results will determine final disposal facility).
8) Backfill excavated area with clean fill to grade (i.e., SRS borrow pit).
9) Establish grass cover.

O&M Activity Sampling and Monitoring for Health and Safety

The identified unit is included in the FFA because of possible historical contamination from a release that occurred in February 1957 from the 904-44G basin. Radiological surveys and controls may be required at the excavation site during the sampling and the excavation within the buffer zone as directed by Rad Protection. If radiological contamination is encountered, Rad Protection will determine if protective equipment and/or personnel access restrictions are required.

The work area will be barricaded as required in the work package to ensure that access is controlled for personnel safety around the work area. Worker health and safety will be directed and controlled as required in the work package and Assisted Hazard Analysis (AHA).

Health and Safety Plan

The health and safety concerns involve worker exposure to unknown waste material that could be excavated. The work will be completed in accordance with the requirements stated in the AHA. The safety requirements and personal protective equipment described in the AHA are appropriate for the sampling and the excavation work. This work will occur within an

established Underground Radioactive Material Area (URMA) due to an inactive H-Area groundwater pipe that traverses through the work zone at a depth greater than 2.5 feet below ground surface.

Characterization and Sampling Plan for the Affected Area within the Unit

Excavated soil will be disposed of as LLW depending on sample results. Soil sampling is required to establish a pre-excavation boundary, establish an approved waste stream for disposal of the excavated soil, and for radiological control purposes as necessary. If any unexpected conditions arise during the sampling or during the excavation, a Timeout will be taken and the Shift Operations Manager (SOM), Environmental Compliance Authority (ECA) and the Maintenance/Site Services Manager will be notified until the Timeout is resolved. Refer to Attachment 2 for the sampling plan.

Contaminated Materials Management and/or Disposal

Radiological contamination has a small potential to be present in the excavated soil. Soil sample results will assist in establishing the work controls necessary for the excavation. All excavated soil will be disposed of in accordance with guidance from Rad Protection, the Generation Certification Official (GCO), and the ECA. Clean soil will be placed in the excavation once the work is complete. The total volume of the soil to be excavated is expected to be less than 30 cubic yards.

Environmental Plans and Permit Modification Requests

There are no existing or new permits identified to execute this work.

Stormwater and sediment control shall be managed using Best Management Practices as necessary to minimize run-on into the excavation area.

CONTINGENCY PLAN

During implementation of the activity, if the conditions change at any time such that the activity is no longer considered “minor” (as defined in Reference 2) or any other unanticipated event occurs, the Project Manager, or the Project Construction Manager shall:

- Stop work, secure the area, contain, and stabilize the area, and determine any necessary change to the activity plan.
- Notify the SRNS on-scene-coordinator (OSC) of the findings and proposed path forward. The SRNS-OSC will communicate the information to the DOE-OSC and obtain concurrence on the path forward.

DOCUMENTATION & REPORTING

ACP will transmit the following documentation to the SRNS-OSC within twenty days of the completion of the activity:

- The signed O&M plan.
- Any sampling and characterization data collected as requested for records.

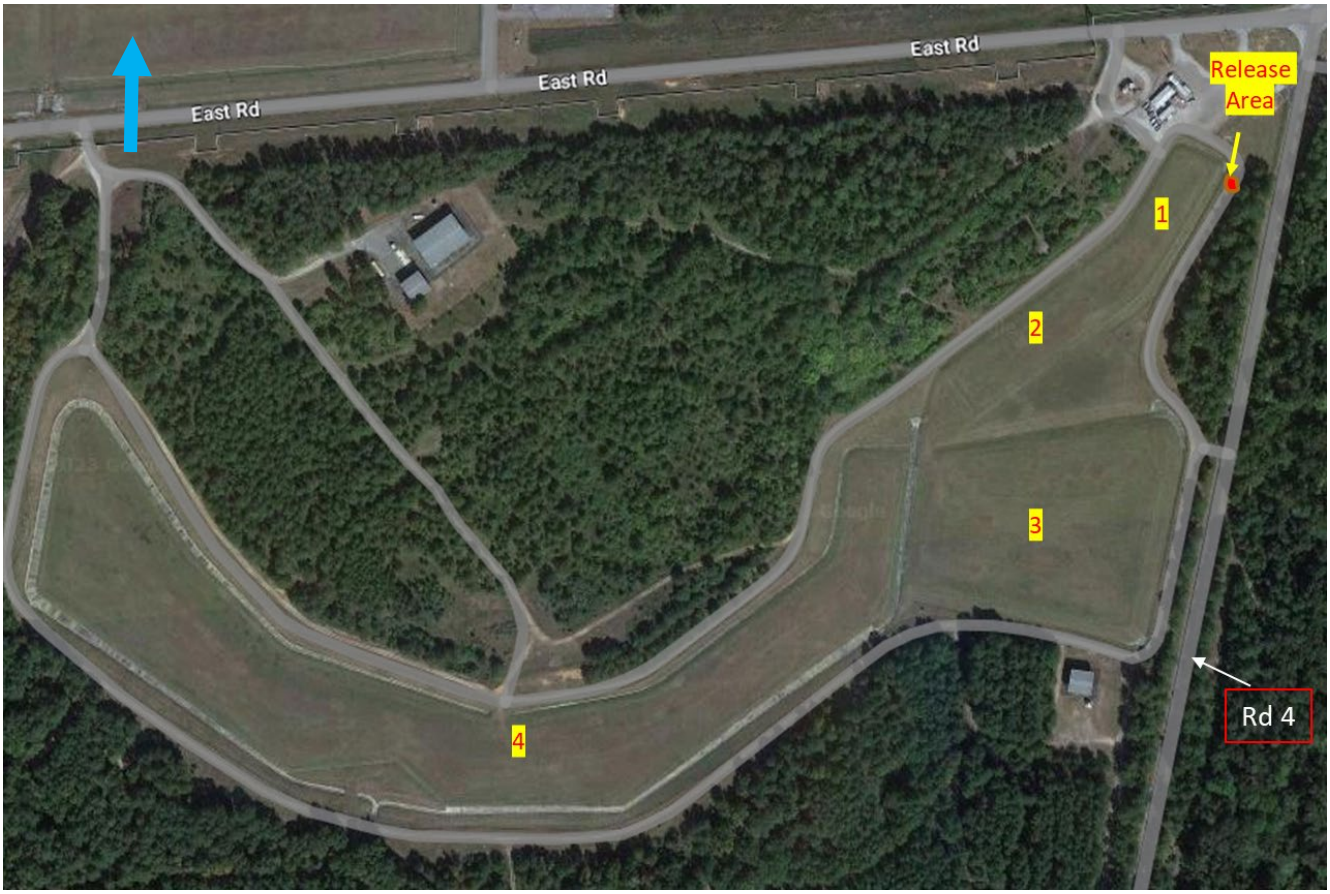
ATTACHMENTS

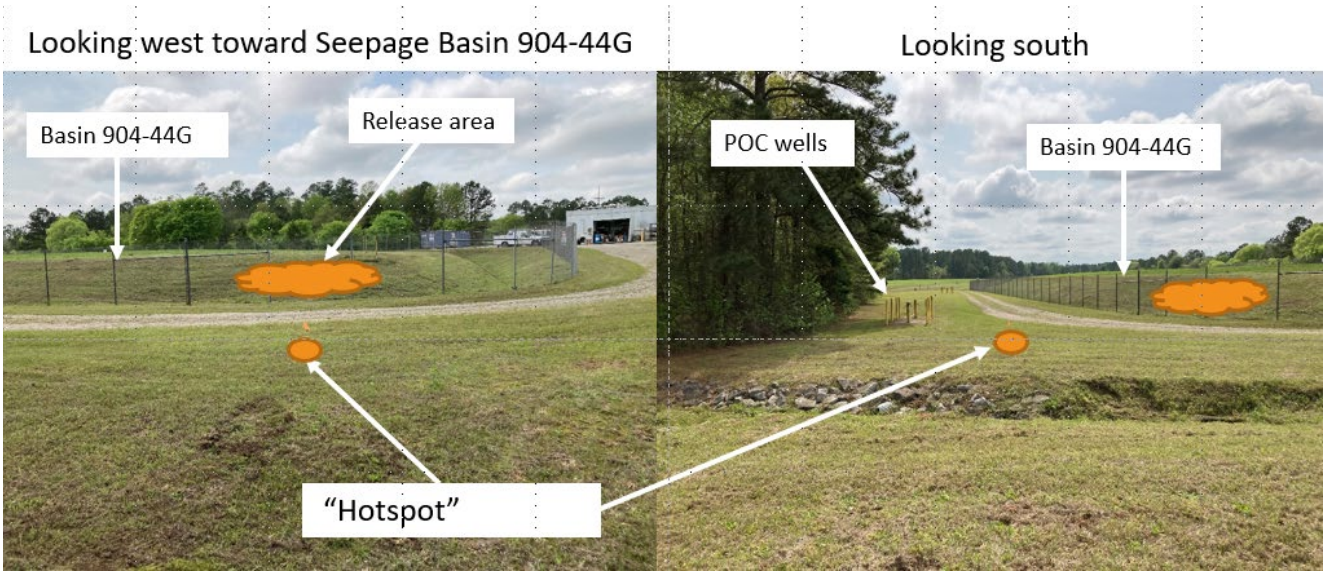
Attachment 1. Location of Site Index 225
Attachment 2. Soil Sampling Plan for the Excavation of the Hotspot Associated with the Spill on 02/01/57 of Unknown of Seepage Basin Pipe Leak from 904-44G (NBN)

REFERENCES

1. SRNS-OS-94-42, Federal Facility Agreement for the Savannah River Site, Administrative Document Number 89-05-FF, effective August 16, 1993, Revision 0 of Appendix C and Revision 0 of Appendix E for Fiscal Year 2022.
2. WSRC-RP-96-45, *Savannah River Site Plan for Performing Maintenance in Federal Facility Agreement Area (O&M Plan) (U)*, December 15, 1996.
3. SRS Manual 8Q Procedure 34, Revision 11 "Excavations and Trenches".
4. SRS Manual 5Q, Chapter 2, Revision 17 “Radiological Standards”.

Attachment 1: Location of Site Index 225





Attachment 2: Soil Sampling Plan for the Excavation of the Hotspot Associated with the Spill on 02/01/57 of Unknown of Seepage Basin Pipe Leak from 904-44G (NBN)

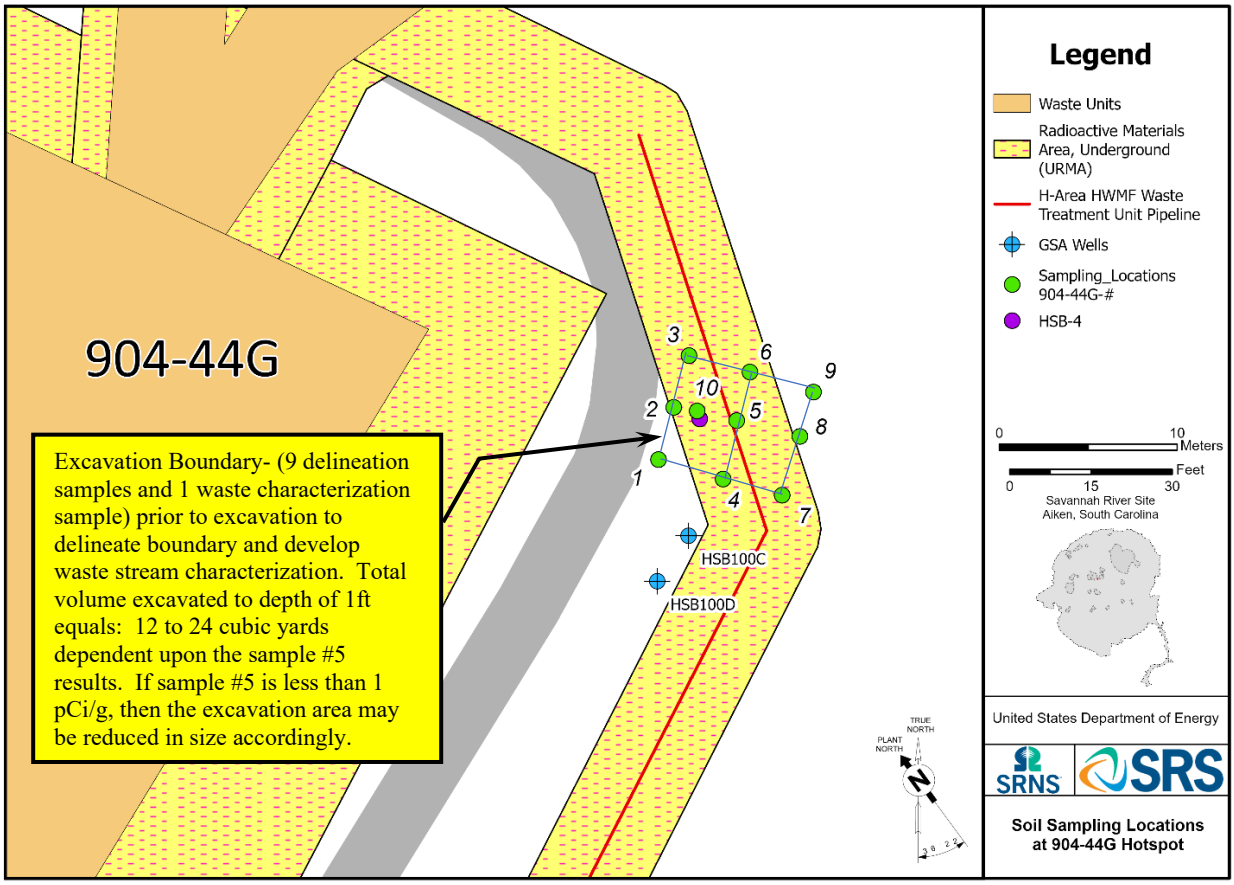
PURPOSE

This sampling strategy will provide data to define the area requiring excavation, support the development of any radiological controls for the excavation of the area based on expected radiological hazards, recalculate the post-excavation decay-corrected risk for this area defined as SRS Index Number 225, and provide the necessary data to develop the waste characterization of the soil for disposal at E-Area. The area is posted as an Underground Radioactive Material Area (URMA). In addition, sample data will be used to support radiological work controls at the discretion of Rad Protection.

SCOPE

The scope of this sampling plan is specific to the release "hot spot" area shown in Attachment 1. Figure 1 below identifies the specific sample locations within the release area that will be obtained for this sampling effort. Sample stations 1 thru 9 will be limited to a 1-ft depth below ground surface, Station 10 will be sampled in the 0-1 and 1-2 ft intervals.

Figure 1– Sample Locations and Excavation Boundary



ANALYTICAL PLAN

Samples will be analyzed for the analytes listed in Table 1 specific to the sample location. Data quality level will be definitive. Field quality control samples will include one split sample, one field duplicate sample and a rinsate/equipment blank. Table 2 highlights the analysis methods, minimum detection activity (MDA), and other pertinent requirements required for the sampling. Composite soil sample at each sample location will be obtained using a hand auger at the locations shown in Figure 1 at a depth of 0 to 1ft in depth. Sample station 10 will be sampled in the 0-1 ft and 1-2 ft intervals and will be analyzed for EAV waste disposal constituents in addition to Cs-137.

Table 1. Sample Matrix

Sample Count	Sample Station	Top Depth *(ft)*	Bottom Depth *(ft)*	Sample Media	Collection Method	Analyte	Proposed Sample Coordinates		Sample Station Surface Elevation
							SRS North	SRS East	
1	904-44G-1	0	1	Soil	Hand auger	Cs-137	N72091.79	E58810.25	258.37
2	904-44G-2	0	1	Soil	Hand auger	Cs-137	N72097.92	E58818.20	258.55
3	904-44G-3	0	1	Soil	Hand auger	Cs-137	N72103.97	E58826.09	258.57
4	904-44G-4	0	1	Soil	Hand auger	Cs-137	N72081.85	E58817.83	257.94
5	904-44G-5	0	1	Soil	Hand auger	Cs-137	N72089.10	E58826.17	258.25
6	904-44G-6	0	1	Soil	Hand auger	Cs-137	N72094.92	E58833.43	258.49
7	904-44G-7	0	1	Soil	Hand auger	Cs-137	N72073.06	E58824.88	257.52
8	904-44G-8	0	1	Soil	Hand auger	Cs-137	N72079.88	E58833.89	257.71
9[1]	904-44G-9	0	1	Soil	Hand Auger	Cs-137	N72085.00	E58840.71	257.46
10[2].	904-44G-10	0 1	1 2	Soil	Hand auger	EAV Isotopes	N72094082	E58821.30	258.38
11	904-44G-10RB	--	--	Water	Rinsate Blank	Cs-137	--	--	--

Note 1. Split sample to be collected and analyzed for Cs-137.
Note 2: Field duplicate sample to be collected and analyzed for Cs-137 only.

Rad Protection will perform the required surveys of the surface soil in accordance with procedure 5Ql.2-485 and any additional soil screening for offsite shipping purposes. If radioactivity in the soil meets or exceeds Soil Contamination Area Limits, contact Rad Protection for further instructions, radiological posting, additional sampling requirements, and follow-up surveys. If radioactivity in the soil meets or exceeds Soil Contamination Area Limits [equal or exceed 150 pCi/g (gross beta activity) or 1000 pCi/g (gross alpha activity) or tritium 800,000 pCi/mL], contact RPD Management for further instructions, radiological posting per 5Q1.1-518, additional sampling requirements and follow-up surveys.

SAFETY

Comply with all safety precautions per applicable procedures and completed AHA. Personnel shall exercise caution when traversing the area due to uneven terrain, briers, bushes, weeds, tall grass, tripping hazards, gravel, and holes. Maintain awareness of poisonous plants and animals. Avoid fire ant mounds. Use safe techniques during use of sampling equipment.

PREREQUISITES

A pre-job review of the sampling plan is required with all sampling personnel prior to the start of sampling activities. Note: Prior to any sampling, at each location an exposure rate reading will be performed with a Bicron µRem and direct probe of surface and substance. If no elevated readings are detected, sampling can commence. If elevated readings are detected, additional radiological controls (i.e., postings, PPE) may be required. Contact Rad Protection FLM for path forward.

SAMPLING PLAN

- Obtain a composite sample for each location down to a depth of 1 foot. The sample should contain only soil material. Discard any grass and all surface organic debris and rocks, if present. Repeat this at each sample location. Sample station 10 will also be sampled in the 1-2 ft interval.
- As soil sample is being removed, Rad Protection to randomly probe soil.
- Package and survey soil samples for transport to the Rad Protection count room.
- Rad Protection will analyze the soil samples for alpha and non-volatile beta-gamma.
- Package samples for offsite analysis
- At the completion of sampling, survey all items for unconditional radiological release.
- If any item/material does not meet unconditional radiological release <20 dpm alpha/100 cm^2, < 200 dpm bg /100 cm^2, and direct probe of non-detect alpha and beta- gamma by direct probe, stop work, survey personnel, post area per radiological survey results, and contact Rad Protection FLM for path forward. All soil samples shall be saved and stored until Rad Protection Management directs the release or disposal of the soil sample.

REFERENCES

1. Manual 5Q1.2 Procedure 485, *Soil Survey and Sampling Techniques*
2. Manual 5Q1.1 Procedure 518, *Radiological Posting*
3. Manual 5Ql.2 Procedure 303, *Analysis of Soil Samples*
4. Manual 8Q Procedure 34, *Excavation and Trenching*
5. Manual 3Q1, Section 9016, *Sampling Surface and Sub-surface Soils for Analytical Purposes*

Table 2: Laboratory Analytical Specifications Table for Radiological Analytes in Soil and Water Media

Radionuclides Isotope	Typical Soil MDAs (pCi/g)	Typical Water MDAs (pCi/mL)	Analytical Method
Alpha Spectroscopy			
Americium-241	0.50	0.40	NNS
Americium-243	0.50	0.462	NNS
Curium-243/244	0.351	0.503	NNS
Curium-245/246	0.416	0.458	NNS
Neptunium-237	0.07	0.771	NNS
Plutonium-238	0.50	0.35	NNS
Plutonium-239/240	0.50	0.353	NNS
Plutonium-242	0.50	0.372	NNS
Thorium-228	0.50	0.445	NNS
Thorium-230	0.50	0.523	NNS
Thorium-232	0.50	0.45	NNS
Uranium-233/234	0.50	0.663	NNS
Uranium-235	0.206	0.684	NNS
Uranium 238	0.50	0.744	NNS
Gamma Pulse Height Analyses			
Actinium-228	0.30	25.00	NNS
Cesium-137	0.15	5.0	NNS
Cobalt-60	0.03	10.00	NNS
Lead-214	0.25	20.00	NNS
Potassium-40	1.00	75.00	NNS
Rad Indicators			
Gross Alpha	3.000	3.00	EPA900.0MOD
Nonvolatile beta	4.000	4.00	EPA900.0MOD
Individual Analyses			
Carbon-14	2.00	10.00	NNS
Iodine-129	2.00	1.00	NNS
Nickel-59	3.38	20.00	NNS
Nickel-63	4.00	10.00	NNS
Promethium-147	10.00	10.00	NNS
Radium-226	0.895	0.30	EPA903.0MOD
Radium-228	1.29	0.50	EPA903.0MOD
Strontium-90	2.00	0.852	NNS
Technetium-99	5.00	17.3	NNS
Tritium	6.00	0.50	EPA906.0MOD

Note: All MDAs are sample-specific. The MDAs represented above are typical MDAs as reported by the subcontract laboratories but are not always achievable.
NNS = No National Standard