Savannah River NUCLEAR SOLUTIONS℠

RCRA Facility Investigation/Remedial Investigation Second Work Plan Addendum for the D-Area Groundwater Operable Unit (D-Area Upgradient Sources) (U)

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SAVANNAH RIVER SITE • AIKEN, SOUTH CAROLINA

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Prepared for
U.S. Department of Energy
and
Savannah River Site Nuclear Solutions, LLC
Aiken, South Carolina

CERTIFICATION

RCRA Facility Investigation/Remedial Investigation Second Work Plan Addendum for the D-Area Groundwater Operable Unit (D-Area Upgradient Sources) (U)

SRNS-RP-2025-01503, Revision ~~0~~1 Redline, ~~January~~ May 2026

[REF: 40CFR270.11 (d)(1)]

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LIST OF ABBREVIATIONS AND ACRONYMNS

ACP	Area Completion Projects
AFFF	aqueous film-forming foam
ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
CEDMS	Comprehensive Environmental Data Management System
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CM	contaminant migration
CMS	Corrective Measures Study
Core Team	USEPA, SCDES, and USDOE
CSM	conceptual site model
D	definitive-level
D&D	deactivation and decommissioning
DAG	D-Area Groundwater
DAOU	D-Area Operable Unit
DCSA	D-Area Coal Storage Area
DEXOU	D-Area Expanded Operable Unit
DQO	Data Quality Objective
ERDMS	Environment Restoration Data Management System
ft	foot/feet
FS	Feasibility Study
FFA	Federal Facility Agreement
FFTA	Fire-Fighting Training Area
GA	Gordon Aquifer
HASP	health and safety plan
IDW	investigation-derived waste
LLC	Limited Liability Company
LUC	Land Use Controls
µg/L	microgram per liter
MCL	maximum contaminant levels
mg/kg	milligram per kilogram
ng/g	nanogram per gram
ng/L	nanogram per liter
NTCR	non-time critical removal
OU	Operable Unit
PCE	tetrachloroethylene
pCi/mL	picocuries per milliliter
PFAS	polyfluoroalkyl substances
PFNA	perfluorononanoic acid
PFOS	perfluorooctane sulfonate
PFUnA	perfluoroundecanoic acid
PQL	Practical Quantitation Limit
QAPP	Quality Assurance Program Plan
QA/QC	Quality Assurance/Quality Control

LIST OF ABBREVIATIONS AND ACRONYMS *(Continued/End)*

RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RFI/RI	RCRA Facility Investigation/Remedial Investigation
RI	Remedial Investigation
ROD	Record of Decision
RSL	Regional Screening Levels
SAP	Sample Analysis Plan
SCDES	South Carolina Department of Environmental Services[1]
SRNS	Savannah River Site Nuclear Solutions, LLC
SRS	Savannah River Site
TBC	to be considered
TCE	trichloroethylene
TO	Technical Oversight
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
UTRA	Upper Three Runs Aquifer
VOC	volatile organic compound
VV	verified and validated
WP	Work Plan
WSRC	Washington Savannah River Company, LLC

[1] South Carolina Department of Environmental Services (SCDES) was known as South Carolina Department of Health and Environmental Control (SCDHEC) prior to July 1, 2024.

1.0 INTRODUCTION

This second Resource Conservation and Recovery Act (RCRA) Facility Investigation / Remedial Investigation (RFI/RI) Work Plan (WP) Addendum has been prepared for the D-Area Groundwater (DAG) Operable Unit (OU) at the Savannah River Site (SRS) and is supplemental to the Revision 1 RFI/RI WP for the DAG OU (D-Area Upgradient Sources) approved by the regulatory agencies in May 2022 (SRNS 2022). An earlier WP Addendum for the DAG OU was approved in 2024 for concrete and soil sampling for per- and polyfluoroalkyl substances (PFAS) in two suspected source areas (SRNS 2024). This is the second WP Addendum submitted for the DAG OU to support investigation of four additional suspect PFAS source areas in D Area and to install additional groundwater wells to characterize the PFAS groundwater plume. The DAG OU is subject to the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Data from the 2022 RFI/RI WP, the 2024 WP Addendum, and this second WP Addendum supports the development of the RFI/RI/Baseline Risk Assessment proposed for submittal in December 2029.

Groundwater in D Area has been monitored since 2004 per the *Monitoring Work Plan for the DAG OU* (WSRC 2004a). Groundwater monitoring reports or data summary letters have been submitted annually to the South Carolina Department of Environmental Services (SCDES) and U.S. Environmental Protection Agency (USEPA) documenting the monitoring results. Monitoring well data collected for DAG OU indicates that the groundwater is contaminated with tritium, volatile organic compounds (VOCs) (primarily trichloroethylene [TCE]), metals, and PFAS.

During the DAG OU Post-Characterization scoping meeting on November 30, 2023, the Core Team (i.e., representatives from the SCDES, USEPA, and the U.S. Department of Energy [USDOE]) discussed uncertainties associated with a contaminant migration (CM) risk to groundwater from PFAS contamination. The Core Team agreed further sampling was warranted in suspected PFAS source area locations in D Area to address these uncertainties. A webcast meeting was held on February 20, 2024, where SRS proposed

concrete and soil sampling for PFAS constituents in two suspected PFAS source areas – the 411-1D Fire-Fighting Training Area (FFTA) and the former 715-D Gasoline Station.

The first WP Addendum presented the characterization investigation designed to determine the nature and vertical extent of PFAS contamination in surficial concrete, vadose zone soils, and Upper Three Runs Aquifer (UTRA) soils. The first WP Addendum also included the plan for confirmation soil sampling for vadose zone soils associated with the D-Area Operable Unit (DAOU) Bubble Tower Subunit soil vapor extraction unit to determine if cleanup levels for tetrachloroethylene (PCE) have been met. In addition, a new UTRA well (DCB087C) for monitoring of metals, sulfate, and VOCs was included in the lower zone of the UTRA in the 484-17D D-Area Coal Storage Area (DCSA) to help further evaluate the ongoing DAG OU Treatability Study and any long-term effects from a non-time critical removal (NTCR) action conducted at the DCSA in 2020 (SRNS 2019a, SRNS 2019b).

This second WP Addendum presents the characterization investigation tailored to delineate four additional potential PFAS source areas, as well as further characterize the overall PFAS plume in the DAG OU. The characterization plan includes sampling for PFAS contamination in the following four potential source areas where aqueous film-forming foam (AFFF) may have been used or discharged: 1) soil and concrete sampling at the 402-D Tank Farm concrete structure remnants located upgradient of the 715-D Former Gas Station; 2) soil sampling at the site of a previous phytoremediation study that used water sourced from a PFAS contaminated D Area groundwater well; 3) soil sampling at an area where a grass fire may have been extinguished with AFFF; and 4) soil and concrete sampling at a stormwater discharge to the D-Area Effluent Discharge Canal tributary. Installation and sampling of seven (7) new groundwater wells to bound and characterize the PFAS groundwater plume is also included in this plan. Additionally, an alternate analyte list for specific D Area wells is presented to optimize and expand understanding of the groundwater plumes in the DAG OU and to add PFAS to the list of analytes for future monitoring. The Sampling and Analysis Plan (SAP) to support the additional data collection is included in this second WP Addendum.

1.1 RI Work Plan Addendum Organization

This second WP Addendum is focused on the information pertinent to the proposed sampling in this addendum. Previous DAG OU characterization associated with D Area historical information, previous investigations, and unit characteristics can be found in the 2022 RFI/RI WP (SRNS 2022) and the 2024 WP Addendum (SRNS 2024).

This second WP Addendum is organized into eleven sections. Section 1.0, Introduction, outlines the regulatory framework, provides a description and history of D Area associated with the PFAS source areas and a brief summary of groundwater contamination and monitoring. Section 2.0, Preliminary Unit Evaluation, is a description of specific DAG OU previous investigations, the unit evaluation conclusions, and potential applicable or relevant and appropriate requirements (ARARs) and "to be considered" (TBC) criteria. Section 3.0, Unit Assessment, outlines the proposed environmental sampling at the DAG OU and path forward for this unit. Section 4.0, Data Quality Objectives (DQOs), describes the DQOs, identifies possible receptors, and presents the conceptual site model (CSM).

The SAP for additional data collection is incorporated into Sections 5.0 through 7.0 of this second WP Addendum rather than submitted as a separate SAP report. Section 5.0, Sampling Design and Rationale, describes the design and rationale of the unit characterization work proposed in this WP Addendum for fiscal year 2026. Section 6.0, Analytical Plan, provides the analytical plan and data quality levels for each type of data collected. Section 7.0, Field Implementation, describes the field collection procedures and data management for the planned samples.

The project health and safety plan is addressed in Section 8.0, Safety, Health, and Emergency Response Plan. Section 9.0 presents the Quality Assurance/Quality Control (QA/QC) Plan. Section 10.0, Schedule, includes the proposed schedule for key deliverables and submittal dates. Section 11.0, References, is a list of references used to prepare this document.

1.2 Regulatory Background

SRS executed the scope included in the first Work Plan Addendum in 2024. The results from this field effort and ongoing groundwater monitoring led to expanded groundwater and surface water sampling and additional source area identification. The results of the additional characterization will be included in the DAG OU RFI/RI report.

A DAG OU Post-Characterization/Second Work Plan Addendum Scoping Meeting was held on November 13, 2025. The sampling results were presented and discussed leading to Core Team agreement on preparing a second Work Plan Addendum to characterize the four additional PFAS source areas identified. In addition, the Core Team agreed to further move out the DAG OU RFI/RI report to December 2029. SRS will submit a schedule extension by letter to USEPA and SCDES incorporating the proposed revised schedule as presented in Section 10.

Detailed information associated with the regulatory background history at the DAOU and DAG OU can be found in the 2022 DAG OU RFI/RI WP (SRNS 2022). The regulatory background associated with the sampling efforts proposed in this second WP Addendum is provided below.

1.2.1 DAG OU PFAS Source Areas

Two areas within D Area, the 411-1D FFTA and the former 715-D Gasoline Station, have been investigated as sources of PFAS to groundwater due to AFFF releases, as described in the previous 2024 WP Addendum (SRNS 2024). The 411-1D FFTA was constructed in D Area in the 1980s between the first two rows of deuterium (heavy water) refining bubble towers after the towers were deactivated and decommissioned (D&D). AFFF was used in multiple fire extinguishing fire pits at the 411-1D FFTA between the 1980s into the late 1990s (Figure 1). Additionally, a fuel fire was potentially extinguished using AFFF in the immediate vicinity of the former 715-D Gasoline Station in D Area (Figure 2).

As discussed in more detail in Section 2.0, four additional potential PFAS source areas were identified based on observed groundwater concentrations, process knowledge, and

interviews with D Area personnel. Preliminary 0-1 foot (ft) soil sampling occurred in third quarter (3Q) 2025 at each location aimed at validating evidence for these areas as PFAS source areas and to focus future characterization efforts. More information on this investigation can be found in Section 2.1 and Section 2.2.1.

1.2.2 D-Area Groundwater Contamination and Monitoring

The groundwater in D Area has been contaminated with tritium, VOCs (primarily TCE), metals, and PFAS from surface and/or facility sources associated with the DAOU and the D-Area Expanded Operable Unit (DEXOU). The DAOU is comprised of multiple waste units and facilities associated with the former operation of the 484-D Powerhouse and the production and rework of heavy water moderator for reactor operations. Most of the sources of groundwater contamination associated with the DAOU have been addressed under earlier remedial and/or removal actions. A final Record of Decision (ROD) for DEXOU was issued in 2004 (WSRC 2004b), an Early Action (EA) ROD for DAOU was issued in 2011 (SRNS 2011), and a Second EA ROD for DAOU was issued in 2020 (SRNS 2020). The final action ROD for completion of the DAOU is scheduled in the Federal Facility Agreement (FFA) (FFA 1993) for issuance in January 2046 pending remedial decisions for the remaining DAOU subunits and completion of D&D of facilities in D Area.

In March 2002, the Core Team created the DAG OU to monitor groundwater quality until the operational facilities in D Area become inactive and a final remedial decision is reached for the DAG OU. Groundwater in D Area has been monitored since 2004 with annual and semiannual monitoring of wells and surface water stations per the *Monitoring Work Plan for the DAG OU* (WSRC 2004a). Groundwater monitoring reports or data summary letters have been submitted annually to SCDES and USEPA to document the monitoring results. The most recent groundwater data summary report was submitted in October 2025 (SRNS 2025a). Additional descriptions of the sources of groundwater contamination can be found in Section 1.2, *Summary of Unit Description*, of the 2022 RFI/RI WP (SRNS 2022).

A treatability study is ongoing in D Area to inject potable water into the UTRA upgradient of a low-pH, metals plume to displace the low-pH groundwater and raise the pH in the

aquifer to more normal, less acidic conditions. The DAG OU Treatability Study monitors groundwater water elevations, field parameters, and metal concentrations to evaluate the impact of continuous groundwater injections and surface water conditions within the D-Area Effluent Discharge Canal. Details associated with the DAG OU Treatability Study can be found in the most recent Treatability Study Data Report submitted in May 2025 (SRNS 2025b). The next DAG OU Treatability Study Data Report summarizing 2025 data and activities will be submitted by May 30, 2026.

In addition, a NTCR action was conducted at the 484-17D DCSA in 2020 to reduce acidity (raise the pH) of the vadose zone soils by mixing in lime amendment from 0-4 ft below ground surface (bgs) to help reduce future leaching of metals from the vadose zone to groundwater.

2.0 PRELIMINARY UNIT EVALUATION

This section describes the preliminary unit evaluation of this second WP Addendum for the DAG OU and presents the results of unit reconnaissance and groundwater well monitoring and sampling data. Detailed unit characteristics for all of DAG OU can be found in Section 2.1, *Unit Characteristics*, of the 2022 RFI/RI WP (SRNS 2022). This preliminary unit evaluation focuses on specific information directly associated with the proposed characterization efforts for this second WP Addendum.

2.1 Existing/Previous Investigations

With the known use of AFFF in the 411-1D FFTA and at the 715-D Gasoline Station, it was suspected that the emerging PFAS contaminant group may be present in groundwater in D Area. Environmental sampling that has occurred on an annual basis since 2020 has indicated that the groundwater and surface water downgradient of these AFFF usage areas has been contaminated with PFAS compounds.

In June 2022, vadose zone and saturated UTRA soil samples were collected at locations downgradient and side gradient of the 411-1D FFTA and at the 715-D Gasoline Station

(Figure 1 and Figure 2). The 2022 soil results were presented in Appendix G of the 2023 Monitoring Report for the DAG OU (SRNS 2023). The maximum soil PFAS result was at boring DBR-02 in the 1 ft sample with a perfluorononanoic acid (PFNA) concentration of 3.39 nanograms per gram (ng/g). However, this location is not directly within, beneath, or immediately adjacent to the fire pits where the highest PFAS contamination may be present based on process knowledge. Additional sampling was warranted due to the uncertainty of groundwater impacts at these two areas and therefore proposed in the 2024 WP Addendum.

The results from soil borings, completed in 3Q2024 (Figure 3 and Figure 4), supported that the FFTA is likely a major source of PFAS to the groundwater in D Area. Vadose zone soil concentrations at the FFTA were roughly 10 to 100 times higher than maximum contaminant level (MCL)-based soil screening levels. Due to the relatively low levels in vadose zone soils and mostly deep contamination in the groundwater around the 715-D Gasoline Station, such as that in well DCB 62 (Figure 2), an upgradient source was suspected. This was further corroborated by firsthand accounts of prior D Area workers who stated that the concrete structure (402-D Tank Farm remnants) upgradient of the 715-D Former Gas Station was used for AFFF training.

Subsequently, three additional potential PFAS source areas were identified based on observed groundwater concentrations, process knowledge, and interviews with D Area personnel as follows: 1) the site of a previous VOC phytoremediation study that used water sourced from an unknowingly PFAS-contaminated D Area groundwater well; 2) an area where a grass fire may have been extinguished using AFFF; and 3) a stormwater/process sewer discharge to the D-Area Effluent Discharge Canal tributary. A total of thirty 0-1 ft soil samples were collected at the four newly identified suspected source areas in 2025 (Figure 5) to aid in identifying where to focus future source area characterization activities.

2.2 Unit Evaluation Conclusions

2.2.1 DAG OU PFAS Source Areas

Sampling results from the soils from the four potential PFAS source areas are presented in Table 1. The 0-1 ft soil samples taken in 3Q2025 at the concrete structure (402-D Tank Farm remnants) indicate that AFFF was likely applied in the vicinity of pads and walls of the concrete structure as the maximum PFAS result at the structures were 200 ng/g for perfluoroundecanoic acid (PFUnA). The results of 0-1 ft soil sampling at the stormwater/process sewer discharge area also displayed elevated PFAS levels with a maximum of 7.8 ng/g for perfluorooctane sulfonate (PFOS). The other two potential source areas (the grass fire area and the phytoremediation area) had detections of PFAS constituents, but at lower levels than the 420-D Tank Farm and stormwater/process sewer discharge areas. Additional characterization is warranted to quantify the PFAS soil contamination in these four potential source areas and collection of background data will provide useful anthropogenic contributions of widespread PFAS contamination for comparison. The results of the preliminary 0-1 ft soil samples will help identify where to focus this additional characterization.

2.2.2 DAG OU Groundwater Monitoring

The groundwater in D Area has been contaminated with tritium, VOCs (primarily TCE), metals, and PFAS. Additional descriptions of the DAG OU groundwater contamination can be found in Section 2.3, Unit Evaluation Conclusions, of the 2022 RFI/RI WP (SRNS 2022) as well as the March 2023 DAG OU Groundwater Monitoring Report (SRNS 2023).

Groundwater and surface water monitoring for DAG OU has been ongoing for the last 21 years in accordance with the Monitoring Work Plan for the DAG OU (WSRC 2004a). Optimization of the DAG OU monitoring network, with Core Team approval, has occurred over the past two decades to add or remove groundwater or surface water monitoring stations, modify contaminants required for sampling, change sampling frequencies, etc.

Groundwater monitoring is also being conducted as part of the DAG OU Treatability Study to reduce the acidic conditions in D-Area groundwater (SRNS 2019b). A subset of the DAG OU groundwater wells and surface water stations are visited and/or sampled more frequently (currently quarterly) for water elevations, field measurements (including pH), and metals analytical sampling. The most recent DAG OU Treatability Study Report was submitted in May 2025 (SRNS 2025b). The next DAG OU Treatability Study Data Report will be submitted by May 30, 2026, summarizing 2025 data results and activities. Additionally, groundwater monitoring within and downgradient of the 484-17D DCSA where a NTCR action was conducted in the vadose zone to reduce acidity in the 0-4 ft soils can be used to evaluate the efficacy of the removal action over time.

2.3 Operable Unit Strategy

The DAG OU groundwater investigation is based on collecting and evaluating historical and real-time analytical data. The presence of additional PFAS sources requires an additional characterization effort per this second WP Addendum and SAP for the following: 1) collect samples in surficial concrete, vadose zone soils, UTRA soils, and Gordon Aquier (GA) soils to determine the nature and vertical extent of PFAS contamination from the four potential source areas identified; 2) collect background samples to have a point of comparison; and 3) install seven new UTRA and GA wells and monitor for VOCs and PFAS to help further characterize the D-Area PFAS groundwater plumes, and provide data to support a planned removal action for PFAS in the high concentration portion of the plume.

Table 2 identifies the proposed new sampling locations and constituents for analysis. Figure 6 through Figure 11 display the proposed locations for the soil and concrete borings and new monitoring wells. Results from this WP addendum sampling effort will be incorporated into the DAG OU RFI/RI which is proposed to be submitted to the USEPA and SCDES on December 10, 2029.

The RFI/RI will evaluate and document the results of the groundwater investigation and identify the groundwater remedial action objectives (RAOs) and cleanup levels. MCLs, or

regional screening levels (RSLs) in the absence of MCLs, will be used as a point of comparison for defining the problem(s) warranting action and the scope of the problem(s). An updated baseline groundwater flow and contaminant fate and transport model will be developed in conjunction with the RFI/RI. The Corrective Measures Study/Feasibility Study (CMS/FS) to evaluate remedial alternatives for groundwater will be developed and is proposed to be submitted in March 2031.

2.4 Potential ARARs and TBC Criteria

A preliminary list of potential ARARs and TBC criteria for the DAG OU is presented in Table 3. Development of ARARs and TBC criteria is an iterative process performed throughout the assessment and corrective action of the DAG OU. This list of potential ARARs is expected to be modified and refined as more data is collected. ARARs may be location-, chemical-, or action-specific.

Because groundwater monitoring data indicate that groundwater in the DAG OU is contaminated, the USEPA Primary Drinking Water Standards of the Safe Drinking Water Act and South Carolina Drinking Regulations are potential ARARs. The Atomic Energy Act is likely to be applicable since tritium is also present in groundwater at DAG OU. Certain other requirements may be applicable depending on specific remedial actions implemented at the unit. RCRA and South Carolina Hazardous Waste Management Regulations may be considered ARARs if waste material is removed from the unit. If groundwater extraction wells or monitoring wells are required for remedial action, then the South Carolina Well Standards would be considered an action-specific ARAR.

Certain potential ARARs can be identified as inappropriate based on existing information available about DAG OU. No critical habitats for endangered species are associated with groundwater; therefore, the Endangered Species Act is not applicable. No archeological or historic sites are located at or near the DAG OU; therefore, the National Archeological and Historic Preservation Act is not included as an ARAR.

2.5 Potential Corrective Measures Study/Feasibility Study Options

2.5.1 Standard Remedial Technologies

Historical groundwater data indicate that D-Area groundwater may require remediation. Likely response actions are identified early in the life cycle of the project to ensure that the planning for data collection will support the response action alternative selection process. The likely response actions for the DAG OU identified in the RFI/RI WP (SRNS 2022) for evaluation in the CMS/FS include Monitored Natural Attenuation with Land Use Controls (LUCs), groundwater monitoring and LUCs (for metals), pH adjustment (for metals), targeted bioremediation (for VOCs), phytoremediation (for tritium), and carbon treatment, resin encapsulation, or other emerging remediation technologies for PFAS, as appropriate.

2.5.2 Innovative Remedial Technologies

Although standard remedial technologies and process options should provide appropriate protection to human health and the environment, innovative technologies will be considered and evaluated for the DAG OU in the CMS/FS stage of development.

2.6 Potential Early and/or Interim Remedial Actions

Characterization data was collected in the high concentration portion of the PFAS plume and discussed with the USDOE, USEPA, and SCDES in the November 13, 2025 scoping meeting to cooperatively develop the best strategy for implementing early actions at the DAG OU, if warranted. The Core Team agreed to conduct a NTCR action for the high concentration portion of the PFAS plume. A Rev 0 RSER/EE/CA will be submitted by SRS in the first quarter of calendar year 2026 evaluating three options for PFAS treatment.

3.0 UNIT ASSESSMENT

The unit assessment for the DAG OU makes use of existing datasets developed from historical data and groundwater monitoring. These data have been used to identify remaining data needs, streamline characterization efforts, eliminate unnecessary sampling,

and provide sufficient data to make decisions at various points in the environmental assessment process. The data will be used to support fate and transport analysis, support a comparison of groundwater concentrations to ARARs, MCLs, or RSLs (as appropriate) to satisfy the CERCLA requirements and identify problems warranting response action, and evaluate RAOs for the DAG OU. The process to qualify the risk to human health and ecological receptors in the Savannah River and other surface water features in D Area is not part of the DAG OU and is being addressed by the Savannah River Floodplain Swamp Integrator Operable Unit. Surface soil sample results will be used to determine risk to human health and ecological receptors, likely as part of the DAOU.

3.1 Objectives

This section presents the unit characterization objectives as they address the CSM and meet the DQO process needs. The following data needs were identified as an outcome of reviews conducted on the DAG OU characterization and monitoring datasets for this second WP Addendum:

- PFAS source area sampling of surficial concrete and soils, vadose zone soils, and saturated soils of the UTRA and GA to support evaluation of CM and provide vertical and horizontal source area characterization of PFAS constituents.
- Collect background PFAS samples.
- Install new monitoring wells in the UTRA and GA to monitor for VOCs and PFAS, as necessary.
- Add PFAS groundwater and surface water sampling to the DAG OU monitoring plan.
- Optimize the DAG OU sampling plan for all analytes.

The primary objective of the additional characterization sampling for the DAG OU is to address data needs identified by the USDOE, USEPA, and SCDES regarding PFAS extent in vadose zone soils and groundwater conditions within the DAG OU that exceed MCLs (or tap water RSLs in the absence of an MCL) which may warrant action. This additional information, in conjunction with existing characterization data, will be used to develop a RFI/RI.

All samples will be analyzed by SCDES-certified laboratories. Surficial concrete and soil samples will be analyzed for PFAS constituents (using method EPA 1633), pH, and total organic carbon (TOC). Groundwater samples will be analyzed for VOCs and PFAS constituents, and tritium at a subset of monitoring wells. Groundwater samples will be verified and validated (VV) data. Soil and concrete samples will be 5% definitive-level (D) data and 95% VV data.

The field investigation will be conducted in compliance with SRS Manual 3Q1, *Hydrogeological Data Collection (U)* (SRS 2025b).

During the soils and groundwater unit assessment, field quality control (QC) samples consisting of duplicates, splits, rinsate blanks, field blanks, and trip blanks, will be collected. Duplicates and splits will be analyzed for the same parameters as the associated samples. Rinsate blanks will be collected at the rate of one per 40 samples and will only be analyzed for PFAS. Field blanks will be collected at the rate of one per 40 samples and will only be analyzed for PFAS. Trip blanks will be collected and shipped with the VOC groundwater samples. If contamination is detected in any field QC blank, contamination of associated samples will be assumed.

3.2 Primary Source Characterization

Groundwater has been impacted by multiple sources within D Area, including subunits associated with the DEXOU and the DAOU. Primary sources include 488-D Ash Basin, D-Area Coal Storage Area (484-17D), D- Area Coal Pile Runoff Basin (489-D), D-Area Rubble Pit (431-2D), D-Area Heavy Water Facility (411-D, 412-D and 413-D), 420-2D Heavy Water Rework Facility, 421-2D Moderator Handling and Storage Building, Fire Training Area (411-1D/411-3D) and the Gasoline Station (715-D). Most of the sources of groundwater contamination associated with the DEXOU and DAOU have been addressed under remedial and/or removal actions.

The following additional areas in D Area have been identified as potential primary sources of PFAS contamination from the prior use of AFFF that will be investigated in accordance with this second WP addendum:

- Concrete structure (402-D Tank Farm remnants) and associated soils upgradient of the 715-D Former Gas Station;
- Grass Fire Area soils;
- Phytoremediation Study Area soils (sprayed with PFAS contaminated groundwater from well DRW 1D); and
- Stormwater/process sewer discharge of PFAS contaminated waters to the D-Area Effluent Discharge Canal tributary.

3.3 Secondary Source Characterization

Secondary sources include impacted concrete, soils, or sediment in and around the facilities as listed in Section 3.2. A total of 6 concrete samples, 125 soil samples (in the vadose zone, UTRA, and GA) and 6 sediment samples will be collected at the concrete structure (Figure 7), grass fire area (Figure 8), phytoremediation study area (Figure 9), stormwater/process sewer discharge area (Figure 10), and/or at groundwater well borings (Figure 6) as shown in Table 2. To aid in secondary source characterization, a total of 15 soil samples will be taken at three background locations (Figure 11).

3.4 Exposure Media Characterization

Groundwater is the primary exposure media at the DAG OU as presented in the CSM (Figure 14~~Figure 12~~) and in Section 4. Groundwater samples have been collected from existing groundwater wells and will be collected from the seven new groundwater monitoring wells. This new data will be used to determine the extent of the groundwater plumes, provide vertical delineation of the plumes, and help evaluate changes/impacts from the future DAG OU PFAS NTCR action in the high concentration portion of the plume.

3.4.1 New Groundwater Monitoring Wells

Five new UTRA monitoring wells (DCB091A, DCB091C, DCB092C, DCB093B, and DCB093C) and two new GA monitoring wells (DCB091D and DCB092D) will be installed to further characterize PFAS and VOC groundwater contamination (Table 2, Figure 6, and Figure 7).

Groundwater samples obtained from the new groundwater monitoring wells will be analyzed for VOCs and PFAS, as necessary, to provide data for the assessment of plume extent and movement. Tritium will be collected from the DCB093B and DCB093C wells in two sampling events (due to their proximity to the tritium plume) but is not expected to be detected above MCLs and will likely not require continued monitoring. If any of the new wells display detections of tritium, tritium will be added for that well on an annual monitoring basis. The proposed groundwater wells are upgradient and outside of the low-pH and metals contaminated plumes in D Area; therefore, monitoring for these constituents is not included.

3.5 Physical Characteristics

Geologic descriptions of the soil cores collected at the four potential source areas and well installations will be conducted. Physical and lithologic descriptions will be used to enhance the hydrogeologic CSM at those locations.

4.0 DATA QUALITY OBJECTIVES (DQO)

The DQO process was developed by the USEPA as guidance for data collection activities (USEPA 2006). The DQOs are developed using an interactive and iterative process approach to decision-making based on seven steps outlined by USEPA guidance: 1) state the problem, 2) identify the goal(s), 3) identify the information inputs, 4) define the boundaries of the study, 5) develop the analytic approach, 6) specify performance or acceptance criteria, and 7) develop the plan for obtaining data.

DQOs are useful in identifying data gaps and in developing SAPs that describe the procedure for collecting sufficient data of known and defensible quality. These data are used to define the nature, magnitude, and extent of contamination and to define human health risks. In turn, these findings will facilitate development of sound decisions concerning remedial response activities. DQOs also assist in determining appropriate detection limits, analytical methods, and sampling and handling procedures/ requirements.

The focus of the DQO development process is efficient planning for data collection. This process is participatory, encouraging input and consensus from all data users, thus facilitating the understanding and acceptance of project goals. The DQO process applies to the entire planning team, including management, regulators, and technical personnel. The DQO process is a series of planning steps based on the scientific methods (Section 4.1.2 through 4.1.8 of this document) detailed in *Guidance of Systematic Planning Using Data Quality Objectives Process* (USEPA 2006). This process provides a systematic and flexible approach to decision-making. Although the steps are described sequentially, the DQO process is iterative. The results of the DQO process are a set of data specifications and an efficient, cost-effective SAP. Thus, major benefits of the DQO process are as follows:

- Promotes efficient, cost-effective, and timely data collection;
- Provides a thorough, systematic approach to relate data collection specifications to the end needs of the data users;
- Involves the decision-makers and the assessment technical team in establishing a definitive plan with objective criteria;
- Aids in communicating and understanding the levels of risk and the basis for decisions; and
- Encourages critical thinking about data gathering and interpretation.

4.1 DQO Evaluation

4.1.1 Conceptual Site Model (CSM)

USEPA guidance for CERCLA remedial investigations stresses the need and utility of conceptual representation of the unit under consideration. Such a representation provides an objective framework around which existing information can be organized and synthesized, data gaps can be identified, and sampling programs can be designed to address critical data needs identified in the DQO process.

The CSM follows USEPA guidance for conceptual representation. It depicts the preliminary understanding of the site and focuses on identifying potential CM from the sources to potential receptors. The CSM for DAG OU is presented in Figure 14~~Figure 12~~. The CSM identifies potential sources of contamination, release mechanisms, media of concern, exposure routes, and potential receptors. Each of these components is described below.

4.1.1.1 Exposure/Physical Attributes

The primary sources to the DAG OU are contaminant releases and process spills or leaks from subunits associated with the DEXOU and DAOU. These primary sources include the 488-D-Area Ash Basin , 489-D Coal Pile Runoff Basin 432-2D D-Area Rubble Pit, 484-17D DCSA, D-Area Heavy Water Facility (411-D, 412-1D, and 413-D), D-Area Heavy Water Rework Facility (420-D Concentrator Building), 420-2D Rework Handling Facility, 421-2D Moderator Handling and Storage Building, FFTA (411-1D/411-3D), and Former Gasoline Station (715-D). The potential additional PFAS sources include AFFF use/impacted areas including the concrete and soil at the 402-D Tank Farm remnants located upgradient of the 715-D Former Gas Station, the Grass Fire Area soils, the Phytoremediation Study Area soils, and the concrete and sediment at and downgradient of the Stormwater/Process Sewer Discharge Area.

4.1.1.2 Primary Release Mechanisms

Contaminants may have been released from the primary sources by the following primary release mechanisms:

- Operation of facilities;
- Spills and leaks from process-related activities and maintenance;
- Runoff and deposition from the surface units; and
- Infiltration/percolation/seepage from the surface units.

4.1.1.3 Secondary Sources of Contamination

Secondary sources of contamination at the DAG OU may include concrete, surface soil (0 to 0.3 m [0 to 1 ft]) and subsurface/deep soil (0.3 m [1 ft] to water table depth) in areas where the primary sources may have been released through infiltration, seepage, surface runoff, and/or discharge.

4.1.1.4 Secondary Release Mechanisms

The secondary sources may release contamination to other media through runoff, infiltration/percolation and leaching of contaminants from concrete and/or soils (all depths) to groundwater.

4.1.1.5 Exposure Pathways (Media)

Contact with contaminated environmental media creates pathways for human and ecological receptors. The exposure pathway (media) at the DAG OU is groundwater (human receptors only).

4.1.1.6 Exposure Routes

The final element in the CSM that links the primary sources to the potential receptors are the exposure routes. Exposure routes for human receptors may include ingestion of contaminated groundwater and showering (includes dermal contact and inhalation).

A quantitative risk assessment is not planned to be conducted for the DAG OU, but rather contaminant concentrations in the groundwater (and surface water) will be compared to MCLs or tap water RSLs in the absence of a MCL to determine exceedances.

4.1.1.7 Receptors

A hypothetical future resident receptor scenario will be used to evaluate exposure to the groundwater media for the DAG OU.

4.1.2 State the Problem

The initial step in the DQO process is to define the problem for the DAG OU so that the focus of the investigation will be clear and disciplined. This step entails summarizing and evaluating data from previous investigations (Section 2.0). A CSM is then developed (Section 4.1.1), and potential exposure pathways are identified.

Previous characterization and monitoring activities indicate the presence of VOCs, tritium, low pH/metals, and PFAS in the groundwater. Although previous groundwater investigations and recurrent groundwater and surface water sampling for DAG OU have determined the extent of groundwater contamination is well known, additional monitoring wells will be beneficial in further characterizing the plumes and provide additional trending information at and downgradient of the PFAS source areas.

VOCs (primarily TCE), tritium, low pH/metals, and PFAS are the primary contaminants and exceed MCLs (or RSLs as appropriate) in groundwater (Figure 15 and Figure 16). The resultant groundwater plumes discharges to the southwest to the D-Area Effluent Discharge Canal, Beaver Dam Creek, and into the D-Area wetlands. Surface waters in the D-Area Effluent Discharge Canal and Beaver Dam Creek exhibit acidic conditions (low pH) and metal and PFAS concentrations that exceed respective groundwater MCLs and RSLs.

Additionally, surface soil sampling for PFAS constituents at newly discovered potential source areas (702-D concrete structure, grass fire area, phytoremediation study area, and

the stormwater/process sewer discharge area) indicates that PFAS contaminants are present above levels that are likely to pose a CM risk to groundwater.

4.1.3 Identify the Decisions

The purpose of this DQO step is to identify the decisions that must be supported with the collected data to address the problem. This step helps define the objectives of the field investigation.

Figure 15~~Figure 13~~ shows the locations of the groundwater plumes in DAG OU. The focus of this second work plan addendum is to further define the PFAS groundwater plume (Figure 6 and Figure 16) and supplement the VOC plume. The following are decisions that need to be addressed for the groundwater under this RFI/RI WP Addendum:

- Install and/or augment existing groundwater monitoring well network to monitor groundwater quality and movement of the PFAS groundwater plume;
- Collect PFAS and VOC samples from all new monitoring wells (DCB091A, DCB091C, DCB091D, DCB092C, DCB092D, DCB093B, and DCB093C). Tritium will be collected at least twice at wells DCB093B and DCB093C (due to their proximity to the tritium plume) but is not expected to be above MCLs. If any of the new wells display detections of tritium, tritium will be added for that well on an annual monitoring basis.; and
- Collect samples of concrete, vadose zone soils, saturated soils of the UTRA and GA, and sediment at four newly identified areas in D Area with possible PFAS contamination (i.e., concrete structure [402-D Tank Farm remnants], grass fire area, phytoremediation study area, and stormwater/process discharge area) to collect data to determine the nature and extent of PFAS contamination and for use in CM risk determinations.

Environmental measurements are necessary to adequately characterize the data gaps. Resources available to resolve the problem include concrete and soil sample collection, the installation of a monitoring well, and groundwater sampling.

Unit screening data will be compiled and evaluated as part of this investigation in accordance with USEPA guidance (USEPA 2006). In conjunction with existing data, the new data will be used to address the decisions listed above and to determine whether the contaminants exceed ARAR criteria, MCLs or RSLs (as appropriate), or background concentrations. Unit-specific stratigraphic and hydrostratigraphic data will support the design and implementation of remedial actions. A strategy for determining potential remedial alternatives is discussed in Section 2.5.

4.1.4 Identify the Inputs to the Decisions

The purpose of this step is to identify the information needed to support the decisions presented in Section 4.1.3 and to specify which inputs require new environmental measurements. Existing data that supports the decisions are also addressed. Each of the following inputs requires new environmental measurements:

- 5% Definitive-level and 95% VV PFAS analytical data for concrete, soil, and sediment media to determine if CM cleanup levels to groundwater are exceeded and to provide vertical profiles of contaminant distribution;
- Collect background PFAS samples to help determine anthropogenic extent and levels of PFAS contamination;
- Screening-level VV analytical groundwater data to determine if MCLs, or in the absence of MCLs, RSLs are exceeded and to support groundwater modeling and removal action evaluation; and
- Hydrostratigraphic and groundwater hydrologic characteristics to provide inputs into contaminant fate and transport analyses.

4.1.5 Define the Boundaries of the Study

The purpose of this step is to identify the spatial limits of the affected media and to determine the discrete area affected by the remedial decisions. This step also investigates temporal changes in the plumes over time. This WP addendum only applies to the characterization efforts presented in Section 4.1.3.

For groundwater, this WP addendum is using the guidance of monitoring stations that have been previously installed and established for years and provide a benchmark for the spatial boundaries of the individual contaminant plumes of concern. Groundwater monitoring will commence after the installation of the additional monitoring wells and is expected in mid-2026 with sampling occurring at least annually. This data will provide trending information for unmonitored zones within the groundwater plumes specifically at and downgradient of the PFAS source area and on the north side of the D-006 stream/ditch. For soils, historical process knowledge, previous soils sampling, and known groundwater contamination has indicated that contaminants may be present above CM cleanup levels. The soil sampling proposed in this second WP addendum will help determine the vertical and horizontal extent of contamination in these potential source areas. Background locations are included to verify anthropogenic PFAs impacts do not need to be considered. It is not expected that any existing infrastructure will interfere with the proposed sampling locations.

4.1.6 Develop Decision Rules

The purpose of this step is to integrate the output from the previous steps of the DQO process to form a statement that defines the conditions of the OU so that the decision maker can choose from the appropriate alternative actions. These actions encompass the entire CERCLA process. Figure 7 through Figure 11 depicts the location of the soil borings and monitoring wells. It is expected that the extent of PFAS contamination in the source areas will be adequately defined after completion of these WP Addendum activities.

MCLs will be the primary point of comparison for groundwater constituent concentrations according to the protocols established in the FFA (FFA 1993). In the absence of an MCL for a constituent, the USEPA tap water RSL will be the primary point of comparison for an Action Level. PFAS soil concentrations will be used to determine if CM risks to groundwater exist.

No new groundwater constituents are expected to be found following new well installations. The purpose of the data to be collected is to supplement the existing

groundwater monitoring network and to provide trending information at unmonitored zones within the groundwater plumes specifically at and downgradient of the PFAS source area and on the north side of the D-006 stream/ditch. All data will be included in the RFI/RI which is proposed to be submitted in December 2029.

Soil and concrete data will be used to determine current secondary source contaminant concentrations (PFAS). PFAS data is being collected from locations that are expected to be the most contaminated, and sample results will be used in future CM calculations to determine if the soil and/or concrete are contaminated at levels that pose a continuing CM concern to groundwater. If so, an appropriate technical and administrative path forward will be discussed with the Core Team (i.e., USDOE, SCDES, USEPA).

Completion of the comprehensive sampling analysis will lead to the presentation and analysis of sampling results for potential continued characterization of contamination extent, determination of contaminants of concern (COCs), and evaluation of remedial alternatives with the support of groundwater modeling.

4.1.7 Specify the Limits on Decision Errors

This section presents guidelines for the decision maker's acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainty in the data. Due to the inherent uncertainty introduced by heterogeneity and error in sampling, storing, transporting, and analyzing environmental media, it is important to specify the acceptable decision error rates. Potential errors resulting from field sampling modifications implemented will be minimized by using standardized sampling and analytical procedures. Savannah River Nuclear Solutions (SRNS) developed specific technical instructions for collecting samples for PFAS analysis, to minimize the risk of anthropogenic PFAS contamination, in the technical report *SRS Sample Collection Guidelines for Per- and Polyfluoroalkyl Substances (PFAS)* **(**SRNS 2021).

All constituents will be analyzed at levels that allow comparison against established MCLs or RSLs (to the extent practicable). The analytical method chosen must be capable of

achieving a Practical Quantitation Limit (PQL) below the established MCL, RSL, or risk-based concentrations. It is understood that the current best available method for PFAS analysis (EPA 1633) cannot achieve soil RSLs for all PFAS compounds. The minimum detection limits that SRS will request from the laboratories for each analyte and the screening levels that will be used in decision making are provided in Table 13 and Table 14. The project will use the results to determine COCs and support a remedial decision that can be agreed to by the USDOE, USEPA and SCDES.

Existing groundwater data are summarized in Section 2.3 of the April 2022 RFI/RI WP (SRNS 2022) and provide a baseline for comparison to data obtained under this WP addendum. Over 20 years of results have been obtained at the DAG OU, which provide a high level of confidence in the data quality and allow for the easy identification of any data anomalies.

4.1.8 Optimize Design for Obtaining Data

This section discusses the most effective sampling and analysis design for generating the data that are expected to satisfy the DQO process needs by reviewing all existing data, performing a characterization, and interpreting the results in a time frame that allows for timely completion of the RFI/RI.

The final step in the DQO process is development of a SAP that takes into account the problems key decisions, environmental variables, and method for identifying the spatial and temporal boundaries of the contamination and populations at risk. SAP content is provided in Sections 5.0 through 7.0.

4.2 Summary of DQO Evaluation

This section discusses the unit characterization objectives as they address the CSM and meet the DQO needs. The data needs developed under the DQO process are summarized in Table 10 through Table 12.

Groundwater samples will be collected from the UTRA and GA to monitor for VOCs and PFAS. Results will be compared to the appropriate MCLs or RSLs. PFAS soil samples will be compared to RSLs as available and will be used in the future to determine CM risks to groundwater.

5.0 SAMPLING DESIGN AND RATIONALE

Implementation of the SAP to obtain decision-quality data for each subunit/media is documented in the remaining sections of this sampling and analysis plan. The following section describes how the plan is implemented to collect the physical data to meet the criteria developed during the DQO process. Table 13 and Table 14 list the laboratory analytical specifications for the samples as described below. Table 16 lists the preservatives, holding times and bottle requirements for concrete, soil and groundwater samples.

5.1 PFAS Concrete and Soil Samples

To aid in the determination if PFAS contamination exists in concrete and vadose zone soils at levels that pose a CM risk to groundwater, multiple depth discrete intervals will be sampled throughout the vadose zone. This includes five concrete samples from the 402-D Tank Farm remnants and one concrete sample from the stormwater/process sewer discharge area as well as 20 total soil borings at the potential PFAS source locations (three hand auger and 17 rotosonic borings), and three background boring locations (Table 4 through Table 9). Saturated soil samples within the UTRA and GA will also be collected as a comparison to the vadose zone samples and for vertical contaminant delineation. Additionally, during installation of the three deepest wells at the three well clusters (two GA wells [DCB091D and DCB092D] and at UTRA well DCB093C), vadose zone soils and saturated soils in the UTRA and GA will be sampled. In total, 152 samples will be collected and analyzed with method EPA 1633 as shown in Table 14.

5.2 Groundwater Samples

In addition to sampling of soil and concrete, this second WP Addendum proposes the installation of seven (7) new groundwater monitoring wells (DCB091A, DCB091C, DCB091D, DCB092C, DCB92D, DCB093B, and DCB093C) (Figure 6 and Figure 7). Wells DCB091A and DCB091C, are both screened in the UTRA, and DCB091D is screened in the ~~Gordon Aquifer (~~GA~~)~~. The DCB091 well cluster will help further evaluate the groundwater plumes in D Area, especially the PFAS plume as this well cluster will be located immediately downgradient of the concrete structure in the 402-D Tank Farm area where PFAS contamination above soil screening levels is expected. Wells DCB092C and DCB092D, screened in the UTRA and GA respectively, are located on the northern side of the D-006 stream/ditch which will help delineate the groundwater plumes and determine how much of the plume is traveling past the ditch. DCB093B and DCB093C, both screened in the UTRA, will be located on the southern side of the D-006 stream/ditch compared to the DCB092 cluster. These two wells will monitor contaminant concentrations downgradient of the Bubble Tower Subunit and form a line with two other existing well clusters (DCB044 and DCB045). Figure 12 and Figure 13 show the proposed new and existing DAG OU groundwater wells in relation to the UTRA and GA potentiometric surface, respectively.

The seven additional groundwater wells will have groundwater samples collected after well development for PFAS and VOCs (Figure 6 and Figure 7). Tritium will be sampled twice at wells DCB093B and DCB093C due to their proximity to the DAG OU tritium plume, but is not expected to be detected or exceed the MCL and likely won't be carried on in future additional sampling. If any of the new wells display detections of tritium, tritium will be added for that well on an annual monitoring basis. Annual groundwater samples will be collected under the regular DAG OU monitoring for VOCs and PFAS. Refer to Table 2 and Table 13 for the list of groundwater analyses to be performed.

6.0 ANALYTICAL PLAN

This section describes the data quality levels for each type of data being collected. All data collected under this SAP will follow the Area Completion Projects (ACP) Quality Assurance Program Plan (QAPP) for Environmental Data Collection and Management (SRNS 2012). The data quality level is determined by the intended use of the data.

6.1 Data Quality Levels for Analytical Results

The data quality level for the permanent well groundwater samples will be VV data level. The data quality level for all soil and concrete samples will be 5% Definitive (D) data level and 95% VV data. Requirements for VV and D data are listed in Table 15. Groundwater samples may be analyzed using USEPA approved methods for constituent analysis or screening methods to determine field results (i.e., dissolved oxygen, pH, turbidity, etc.) Data will be qualified by the Savannah River Nuclear Solutions, LLC (SRNS) auto-validation software module for the following aspects of USEPA Functional Guideline Criteria to achieve the VV quality level: Quantitation Limits, surrogate or tracer recoveries, blanks (method/lab/prep, trip, field, rinsate), lab control sample recoveries, matrix spike recoveries/duplicates, lab replicates, field duplicates, cooler temperatures, chemical preservation, and holding times. The laboratory will provide an electronic data deliverable and case narrative and respond to inquiries about the analytical data package for SRNS to run the auto-validation software. All fatal errors, data errors, and warnings will be fixed during the verification process, and the data set will be reviewed for completeness. The auto-validation routines will be conducted, and the data qualified accordingly. Data usability will be assessed using the following PARCC parameters:

1. **Precision** is the mutual agreement between individual measurements of the same property under similar conditions. Precision is determined from the field and laboratory duplicate analyses and indicates the consistency of field and laboratory techniques.

2. **Accuracy** is determined from the laboratory control samples; matrix spikes; serial dilutions; surrogates/tracers; internal standards/carriers; and the results of the method, field, trip, and equipment rinsate blanks. Accuracy indicates the ability of the field and laboratory process to generate correct results. Blank results specifically monitor for any contamination from sample processing. ~~Representativeness expresses the degree to which sample data accurately and precisely represents the characteristics of a population, variations in a parameter at a sampling point, or an environmental condition that they are intended to represent. For this project, representative data will be obtained through careful selection of sampling locations and analytical parameters, Representative data will also be obtained through proper collection and handling of samples to avoid interference and minimize contamination.~~

3. **Representativeness** of data will also be ensured through consistent application of established field and laboratory procedures. Representativeness expresses the degree to which sample data accurately and precisely represents the characteristics of a population, variations in a parameter at a sampling point, or an environmental condition that they are intended to represent. For this project, representative data will be obtained through careful selection of sampling locations and analytical parameters, Representative data will also be obtained through proper collection and handling of samples to avoid interference and minimize contamination. Laboratory, field, and trip blank samples will be evaluated for the presence of contaminants to aid in evaluating the representativeness of sample results. Data determined to be nonrepresentative, by comparison with existing data, will be used only if accompanied by appropriate qualifiers and limits of uncertainty.

4. **Completeness** is a measure of the percentage of project-specific data that are valid. Valid data are obtained when samples are collected and analyzed in accordance with sampling matrix table and QC procedures outlined in this document, and none of the QC criteria that affect data usability are exceeded. When all data validation is completed, the percent completeness value will be calculated by dividing the number

of useable sample results by the total number of sample results planned for this investigation.

5. **Comparability** expresses the confidence with which one data set can be compared with another. Comparability of data will be achieved by consistently following standard field and laboratory procedures and by using standard measurement units in reporting analytical data. Field procedures are standardized, and field operations will adhere to SOPs to ensure comparability. The comparability of laboratory data will be assured by use of established and approved analytical methods and by certified laboratories, consistency in the basis of analysis (wet weight, volume, or similar units), and consistency in reporting units (µg/L, picocuries per milliliter [pCi/mL], etc.). Comparability will be determined from split and duplicate sample comparisons or screening level and definitive level comparisons. Comparability is an indicator of both precision and accuracy.

Table 16 lists the preservatives, holding times and bottle requirements for groundwater and surface water to meet the data qualities necessary to meet the DQOs.

6.2 Field Analytical Sampling Quality Assurance/Quality Control

QC samples will consist of field duplicates, rinsate/equipment blanks, trip blanks and split samples. Field QA/QC will be maintained through the use of QA/QC samples and methods as described below.

1. Field Duplicate (co-located) Samples: Two or more independent samples collected from side-by-side locations at the same point in time and space so as to be considered identical. These separate samples are intended to represent the same population and are carried through all steps of the sampling and analytical procedures in an identical manner. These samples are used to assess precision of the total method, including sampling, analysis, and site heterogeneity. Field duplicate samples are planned at a combined minimum rate of 5% according to ER-SOP-043, or typically 1 per 20 samples and analyzed for the same parameters as the associated samples.

2. Equipment Blank: A sample of water free of measurable contaminants poured over or through decontaminated field sampling equipment that is considered ready to collect or process an additional sample. The purpose of this blank is to assess the adequacy of the decontamination process. Also called rinse blank or rinsate blank. Equipment blanks are typically planned at a rate of 1 blank per 40 samples.

3. Field Blank: (PFAS only) A sample of water free of measurable contaminants poured from one bottle to the sample bottle. The purpose of this blank is to assess the adequacy of environmental and sampler contamination of PFAS. One field blank is planned for each of the potential source areas.

4. Trip Blank: A clean sample of water free of measurable contaminants that is taken to the sampling site and transported to the laboratory for analysis without having been exposed to sampling procedures. Trip blanks are analyzed to assess whether contamination was introduced during sample shipment (typically analyzed for VOCs only). A blank consists of distilled-deionized water provided by the laboratory to be placed in every cooler with VOC samples typically at the rate of 1 trip blank per cooler.

5. Split Samples: Two or more representative portions from a sample in the field, analyzed by at least two different laboratories and/or methods. Prior to splitting, a sample is mixed (except volatiles, oil and grease, or when otherwise determined) to minimize sample heterogeneity. These are quality control samples used to assess precision, variability, and data comparability between laboratories. Split samples are planned at a combined minimum rate of 5% or typically 1 per 20 samples and analyzed for the same parameters as the associated samples. For PFAS samples, if a secondary laboratory is not available to run the recently approved EPA 1633 method, an alternate analytical method may be used (e.g., EPA 537MOD/537.1MOD for soils/concrete and EPA 533 for groundwater).

Table 15 provides the minimum field QC/QA requirements (numbers of duplicate, split, and blank samples) for VV and D level data.

6.3 Sample Matrix Table

Tables 2 and 4 through 8 include detailed information for all locations where samples are to be collected. The number of duplicate and split samples will meet or exceed the requirements of Table 15 and trip and equipment blanks will be collected at a frequency shown in Table 15.

The seven new wells DCB091A, DCB091C, DCB091D, DCB092C, DCB092D, DCB093B, and DCB093C will be added to the DAG OU monitoring network and include annual analyses for VOCs and PFAS. Tritium will also be sampled at least twice; however, it is not expected to be detected so it is not included for ongoing monitoring. If any of the new wells display detections of tritium, tritium will be added for that well on an annual monitoring basis.

Additionally, PFAS groundwater and surface water monitoring have not officially been added to the DAG OU monitoring plan. During the November 13, 2025, DAG OU Post-Characterization scoping meeting the annual PFAS sampling requirements were agreed upon by the Core Team and are provided in Table 17 for groundwater wells and Table 18 or surface water stations. It is also proposed that all groundwater and surface water sampling be reduced to annul sampling. This would include a reduction of 13 monitoring wells (DCB 21A, DCB 21B, DCB 21C, DCB 22A, DCB 22B, DCB 22C, DCB 55, DCB 70A, DCB 70B, DWP 2, DWP 3A, DWP 3C, and DWP 8) from semiannual to annual sampling for metals, redox/dissolved oxygen, sulfate, ferric and ferrous iron, and/or uranium. Due to long-time trends for over 20 years, continued annual sampling at these monitoring wells will continue to provide sufficient data until the DAG OU ROD remedial action start date.

6.4 Sample Location Maps

Figure 6 illustrates the new groundwater well sample locations, and Figure 7 through Figure 11 illustrate the existing and proposed locations of concrete and soil samples to be collected.

7.0 FIELD IMPLEMENTATION

The following sections outline the field implementation procedures and processes for the DAG OU RFI/RI WP Addendum characterization effort. Additional implementing documents such as the environmental evaluation checklist, automated hazard analysis, and site-specific health and safety plan are internal to SRS and detail day-to-day sampling operations and safety requirements.

7.1 Sample Collection Procedures and Processes

The DAG OU characterization effort will include concrete, soils, and groundwater as part of this SAP, using SRS Manual 3Q1, *Environmental Requirements and Program Documents* (SRS 2025b). The following specific procedures will be followed:

- Technical Oversight (TO) Requirements for Groundwater Monitoring Wells and Soil Borings, SRNS Manual 3Q1, Section 9004
- Soil Boring Investigations, SRNS Manual 3Q1, Section 9006
- Specifications for Installation of Piezometers and Monitoring Wells, SRNS Manual 3Q1, Section 9007
- Sampling Groundwater Monitoring Wells, Tanks/Vessels (Sample Ports or Spigots) and Surface Water, SRNS Manual 3Q1, Section 9015

These procedures are consistent with the *USEPA Region 4 Field Branches Quality System and Technical Procedures* sampling procedures. Prior to beginning all field activities, all field crews will be required to read the procedures listed above and the TO will have had experience with those activities.

As described earlier, PFAS sampling involves a rigorous routine to avoid cross contamination. As of issuance of this SAP, the sampling regime is described in the technical report *SRS Sample Collection Guidelines for Per- and Polyfluoroalkyl Substances (PFAS)* **(**SRNS 2021). This technical report lists pre-sampling requirements, PPE requirements, sampling guidelines, and packaging guidelines. These include

limitations on clothing and products that can be worn/used (e.g., waterproof clothing, sharpies/markers, etc.), places to avoid touching with hands (e.g., the inside cap or around the edge of bottles), and other general guidance (e.g., stand downwind of sample collection site). Concrete samples will be crushed into smaller particles, homogenized, and bottled.

7.2 Equipment and Decontamination Procedures

The following equipment will be required to sample groundwater and surface water:

- Camera for photo documentation;
- Field Logbook and/or Field Data Recorder with backup batteries;
- Global positioning system unit and backup batteries;
- Personal Protective Equipment;
- KIJ5 radio, Cell phone, and pager;
- All sample bottles with preservatives;
- PFAS compliant pumps, tubing, and other sampling devices; and
- Cooler and frozen blue ice or equivalent for packing samples in the field (PFAS samples require bagged wet ice).

Equipment needs will vary from day to day based on sampling requirements and field conditions. Specific needs will be addressed at plan-of-the-day meetings by the TO, industrial hygiene personnel, and safety personnel. Equipment selection and d~~D~~decontamination of field sampling equipment will be done in accordance ~~to~~with the 3Q1 Manual Procedure 9016, Section 5.4 and *SRS Sample Collection Guidelines for Per- and Polyfluoroalkyl Substances (PFAS)* (SRNS 2021). Disposal of investigation-derived waste (IDW) will follow the job specific waste management plan.

7.3 Sample Documentation

Overall documentation will be done in accordance with *Area Completion Projects Quality Assurance Project Plan for Environmental Data Collection and Management* (SRNS 2012). Sample documentation will be conducted according to Manual C3, ER-SOP-043, standard operating procedure for *Obtaining and Managing Environmental Data for Environmental Compliance & Area Completion Projects*, which provides the general

requirements and guidelines that are necessary for the documentation, record keeping, mobilization, collection, processing, reporting and storage of environmental data. Data Management Plan Q-DMP-B-00001, Environmental Restoration Data Management System, requires sampling information, such as barcoded dates, times, sample identifications, weather, etc., to be recorded and maintained in logbooks and Chain-of-Custody documents included in the sampling package delivered to the project. Sampling documentation is tracked through a series of documents including:

- Mobilization Report;
- Chain-of-Custody Forms;
- Field Log Books;
- Analytical Data Packages; and
- SCDES and SRS required logs and forms.

A logbook for recording sample collection activities will be kept for this project. The subcontractor will ensure the logbook is correctly filled out and returned within two weeks after completion of sampling. Essential field information is: sample name, date of collection, time of collection, and sampler's name. Space should be provided for any field observations or comments relating to the quality or representativeness of the sample. Information on the parent sample of each field duplicate should be recorded.

7.4 Chain-of-Custody

Chain-of-Custody procedures establish requirements for sample custody and documenting custody from the time of collection through laboratory analysis. Chain-of-Custody demonstrates that samples obtained in the field have been securely collected and transported and have reached the analytical laboratory without alteration. Chain-of-Custody requirements are established by SRNS Manual 3Q1, Procedure 1001, *Chain-of-Custody Procedure*. At a minimum, Chain-of-Custody documents will include the following information which is compliant with USEPA requirements:

- Project name – i.e., monitoring well name, RFI/RI project name, etc.;
- Time of sample collection;
- Sample identifiers (bar-coded labels);
- Sample description;

- Sample identification;
- Number of sample containers/bottles;
- Sampler's signature for each sample, the sampler indicates;
- Date of sample collection;
- Whether a sample is persevered or unpreserved;
- Whether a sample is filtered or unfiltered; and
- Analyses to be performed.

A Chain-of-Custody record is used as physical and legal evidence of sample custody to trace the sample from collection through delivery to the analyzing laboratory and where the samples were stored. The Chain-of-Custody record must originate with the responsible organization or the person collecting the sample. Every sample is assigned a unique identification number that is entered on the Chain-of-Custody document. The Chain-of-Custody records each transfer of custody of the samples by a relinquishing party to a receiving organization whose name and identifying contact information is located on the form.

7.5 Sample Management and Shipping

Samples will be collected in accordance with SRNS Manual 3Q1, Section 9000, *Hydrogeologic Data Collection Procedures and Specifications* (SRS 2025b). Sample management for analytical laboratories and intra-SRS facilities is primarily controlled by SRNS Quality Assurance Manual 1Q, Procedure 13-1, *Packaging, Handling, Shipping, Storage and Receiving*. The purpose of this procedure is to define the requirements and specify the responsible parties and their roles for the packaging, handling, shipping, storage, and receiving of items to ensure that they are properly controlled to prevent damage or loss and to minimize their deterioration. Sample shipment is also regulated by SRNS Manual 19Q, Procedure 1.02, *General Transportation Requirements for Radioactive and Non-Radioactive Hazardous Materials*. These manuals provide specific requirements to sampling personnel for the required packaging, labeling, record-keeping, selection of appropriate transportation carrier, and appropriate transport container based on the analytically pre-tested nature of a sample. Samples associated with this second RFI/RI

WP Addendum are non-hazardous and non-radiological as they represent environmental media rather than waste materials.

Samples will be stored in coolers with blue ice or bagged wet ice, as applicable, in the custody of the sampler, or designee, until delivered to the ACP Sample Packaging personnel. If samples need to be stored overnight prior to delivery to the sample-packaging group, then they will be stored in a locked facility with the Chain-of-Custody record and in a refrigerator (4°C ± 2°C) if required for sample preservation. ACP Sample Packaging personnel will manage, package, and ship samples to the laboratories in accordance with Manual C3, Volume IX Procedure ER-SOP-803B, *Packaging of Non-Department of Transportation (DOT) Samples for On-Site Transfers/Off-Site Shipments*. Table 16 lists proper preservatives, holding times, and sample containers for samples collected in the field, stored, and transported to the analytical laboratories.

7.6 Data Validation and Data Management

Requirements for data validation/verification and data management procedures are found in SRNS Procedures and Standard Operating Procedures, the USEPA Functional Guidelines, and two USDOE National Policies and Procedures:

- SRNS Manual C1, ER-AP-305 – Use of Field-Generated Blanks;
- SRNS Manual C1, ER-AP-306 – Laboratory Data Records Review;
- SRNS Manual C3, Volume X, ER-SOP-033 – Analytical Data Qualification;
- SRNS Manual C3, Volume X, ER-SOP-043 – Obtaining and Managing Environmental Data for Environmental Compliance & Area Completion Projects;
- Data Management Plan, Q-DMP-B-00001, Environmental Restoration Data Management System;
- Department of Energy Consolidated Audit Program, Policies and Practices, Procedure AD-1, Revision 2, November 10, 2009; and
- Quality Systems for Analytical Services, Revision 2.5, Department of Energy, November 9, 2009.

In addition, SRS procedures incorporate the criteria found in the USEPA National Functional Guidelines to verify, validate, and qualify analytical data to assess its usability for risk and remedial management decisions. Adherence to this complex list of procedures and guidelines establishes: (a) if data meets the specific technical and QC criteria established by the DQOs and laboratory QAPPs; and (b) the usability of any data not meeting the specific technical and QC criteria. All data is qualified for usability using USEPA Functional Guidelines. Adherence to the guideline requirements and the USDOE Audit Program for analytical laboratories allows the data to be qualified based upon a set of nationally established functional guideline qualifiers for uniformity.

Depending upon the PQOs, data will be verified and/or validated according to the following criteria:

- Verification – Confirmation by examination and provision of objective evidence that the specified analytical requirements have been met. This is to be an electronic data deliverable completeness check for all required fields. Data verification consists of a completeness check to confirm that all sampling data and data fields requested from the laboratory have been received and comply with specified requirements.

- Validation – Confirmation by manual examination and provision of objective evidence that the particular requirements for a specific intended use are fulfilled. Data validation consists of any analyte and sample specific process for evaluating compliance of the laboratory data received with methods, procedures, or contract requirements. Definitive-level data undergoes a more thorough manual validation of the laboratories and lab provided data (e.g., Contract Lap Program-like forms QC, sample quantitation reports, calibrations and calibration verifications, and other quality control measurements) and has the most certainty associated with it.

The ACP Data Management group will enter sample collection and laboratory data into the Comprehensive Environmental Data Management System (CEDMS) in accordance with Procedure ER-SOP-43. Properly completed and qualified data is entered into the CEDMS

Database. Data records are updated, re-qualified, and continuously corrected for usability based on the results of electronic verification and manual validation evaluations as corrective actions are resolved with the analytical laboratories. A data usability report will be prepared that will accompany the DAG OU RFI/RI and CMS/FS reports.

7.7 Investigation-Derived Waste Identification, Generation, and Management

Sampling activities associated with the DAG OU may generate aqueous and non-aqueous IDW. Aqueous IDW will be managed in accordance with the IDW Management Plan (WSRC 2007). Aqueous IDW may consist of decontamination rinsates or monitoring well purge water, which may contain listed waste. Non-aqueous IDW may include soil, concrete, and soil cuttings. Given the historical industrial activities in D-Area, and the existence of extensive areas of land use controls associated with DEXOU and the Ash Basin closures, SRS proposes to use industrial RSLs for PFAS that may be present in non-aqueous IDW. These materials would be returned to the ground in the phytoremediation study area if the PFAs concentrations are below industrial RSLs, rather than the residential RSLs typically used as identified in Appendix B in the IDW Management Plan. Additional IDW-specific information will be documented in an IDW Management Strategy, which will be maintained in the project record file.

8.0 SAFETY, HEALTH, AND EMERGENCY RESPONSE PLAN

A unit-specific health and safety plan (HASP) (if required) will be prepared in accordance with 29 Code of Federal Regulations 1910.120 and approved prior to field investigations. This plan will meet Occupational Safety and Health Administration requirements and follow Savannah River Site safety, health, and emergency response plan guidance (WSRC 1996). All personnel involved in the performance of the work shall be familiar with the provisions of the HASP.

9.0 QUALITY ASSURANCE / QUALITY CONTROL PLAN

Precision, accuracy, completeness, representativeness, comparability, and documentation of the characterization are specified in the Savannah River Site site-level quality assurance manuals listed below:

- WSRC-RP-96-234, Revision 1, Savannah River Site RCRA Facility Investigation / Remedial Investigation Work Plan Safety, Health, and Emergency Response Plan, Quality Assurance / Quality Control, and Data Management Requirements (WSRC 1996)
- SRS Procedure Manual 1Q, Quality Assurance Manual (U) (SRS 2025a)
- Area Completion Projects Programmatic Quality Assurance Project Plan for Environmental Data Collection and Management, ERD-AG-2005-00001, Revision 5, April 2012 (SRNS 2012)

Table 15 shows the QA/QC requirements of the sampling plan.

10.0 SCHEDULE

This section includes the currently proposed schedule of field activities, documents, and report submittals for the DAG OU.

The estimated completion date for field activities is September 2026.

A summary of key deliverables and submittal dates are as follows:

Deliverable	Submittal Date
Revision 0 RFI/RI Report	12/10/2029
Revision 0 Corrective Measures Study / Feasibility Study	03/12/2031
Revision 0 Statement of Basis / Proposed Plan	11/12/2031
Record of Decision	07/20/2032
Record of Decision Issuance	04/01/2033
Remedial Action Start	06/24/2034

The review schedule for these documents is shown in Figure 17~~Figure 14~~, which also shows the schedule for preparation and review associated with regulatory documents.

11.0 REFERENCES

FFA, 1993. *Federal Facility Agreement for the Savannah River Site*, Administrative Docket No. 89-05-FF (Effective Date: August 16, 1993)

SRNS, 2011. *Early Action Record of Decision Remedial Alternative Selection for the D-Area Operable Unit*, SRNS-RP-2010-00162, Revision 1.2, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2012. *Area Completion Projects Programmatic Quality Assurance Project Plan for Environmental Data Collection and Management*, ERD-AG-2005-00001, Revision 5, April 2012

SRNS, 2019a. *Removal Site Evaluation Report/Engineering Evaluation/Cost Analysis (RSER/EE/CA) for the D-Area Coal Storage Area (484-17D) (U)*, SRNS-RP-2018-00813, Revision 1, June 2019, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2019b. *D-Area Treatability Study,* SRNS-RP-2018-00128, Revision 1, January 2019, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2020. *Second Early Action Record of Decision Remedial Alternative Selection for the D-Area Operable Unit*, SRNS-RP-2018-00461, Revision 1, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2021. *SRS Sample Collection Guidelines for Per- and Polyfluoroalkyl Substances (PFAS)*, SRNS-TR-2021-00356, Rev 1. November 2021, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2022. *RCRA Facility Investigation/Remedial Investigation Work Plan for the D-Area Groundwater Operable Unit (D-Area Upgradient Sources) (U),* SRNS-RP-2019-00394, Revision 1, May, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2023. *2023 Groundwater Monitoring Report for the D-Area Groundwater Operable Unit 2021-2022 Data (U)*, SRNS-RP-2023-00261, Revision 0, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2024. *RCRA Facility Investigation/Remedial Investigation Work Plan Addendum for the D-Area Groundwater Operable Unit (D-Area Upgradient Sources) (U)*, SRNS-RP-2024-00312, Revision 1, July, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2025a. *D-Area Groundwater Operable Unit (OU) Annual Data Summary Report – 2024 Data (U)*, SRNS-RP-2025-01191, Revision 0, emailed on 10/30/2025, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRNS, 2025b. *Treatability Study Data Report for Groundwater Injection and Discharge Canal Neutralization at the D-Area Groundwater Operable Unit (OU) (U) – 2024 Data and Information*, SRNS-TR-2025-00218, Revision 0, Savannah River Nuclear Solutions, LLC, Savannah River Site, Aiken, SC

SRS, 2025a. *SRS Procedure Manual 1Q*, Quality Assurance Manual (U), Savannah River Site, Aiken, SC

SRS, 2025b. *SRS Procedure Manual 3Q1*, Section 9000, "Hydrogeological Data Collection Procedures and Specifications (U)", Savannah River Site, Aiken, SC

USEPA, 2006. *Guidance on Systematic Planning Using the Data Quality Objectives Process*, EPA/240/B-06/001, U.S. Environmental Protection Agency, Washington, D.C.

WSRC, 1996. *RCRA Facility Investigation Remedial Investigation Work Plan for Safety, Health, and Emergency Response Plan (SHERP), Quality Assurance/Quality Control (QA/QC) and Data Management Requirements*, WSRC-RP-96-234, Revision 1, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2004a. *Monitoring Work Plan for the DAG OU*, WSRC-RP-2003-4150, Revision 1, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2004b. *Record of Decision Remedial Alternative Selection for the D-Area Expanded Operable Unit*, WSRC-RP-2004-4007, Revision 1, August 2004, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC

WSRC, 2007. *Savannah River Site Investigation-Derived Waste Management Plan*, WSRC-RP-94-1227, Revision 9, Washington Savannah River Company, Savannah River Site, Aiken, SC

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Figure 1. D-Area 411-1D Fire-Fighting Training Area (FFTA)

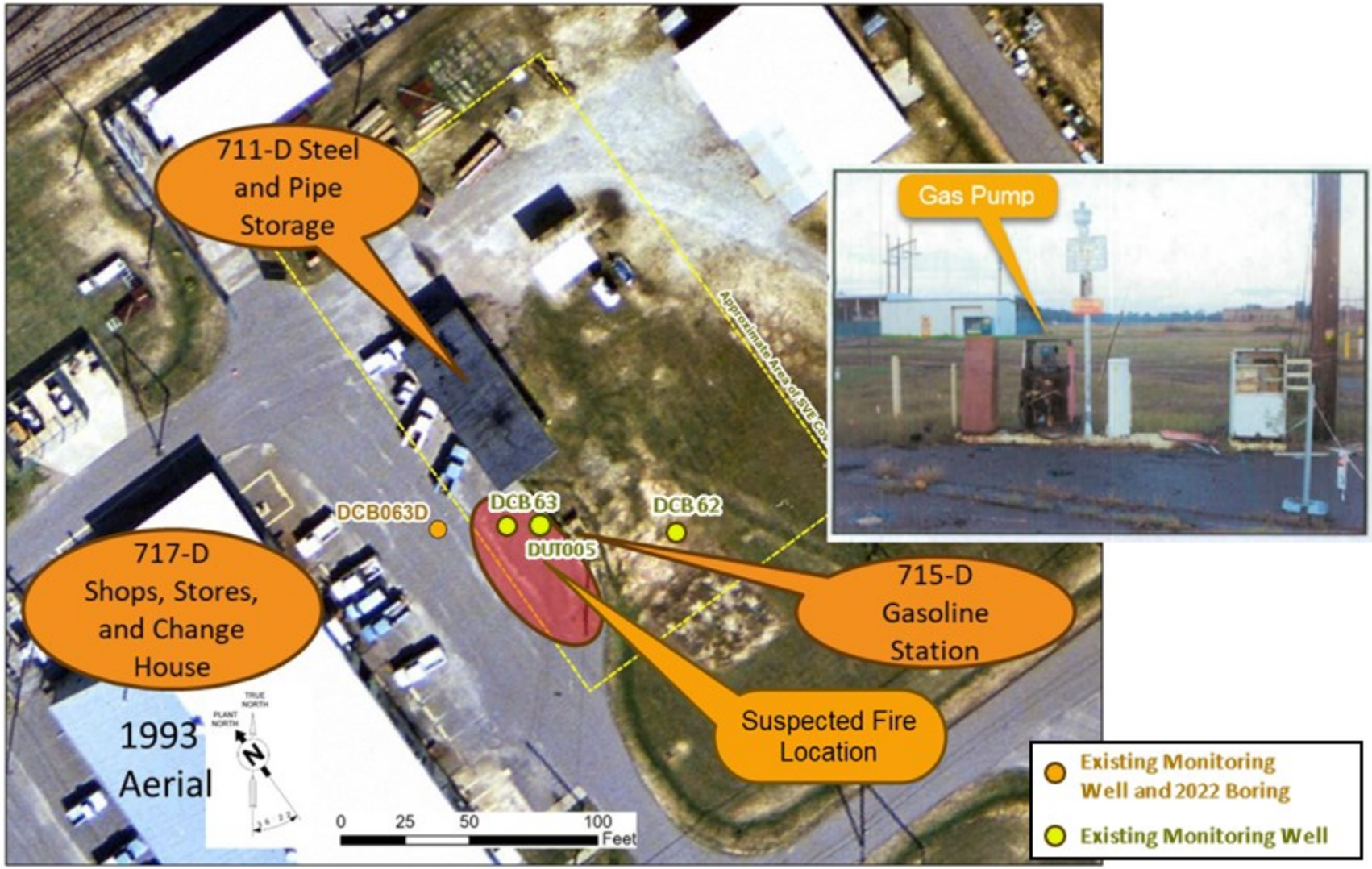


Figure 2. D-Area 715-D Gasoline Station Area

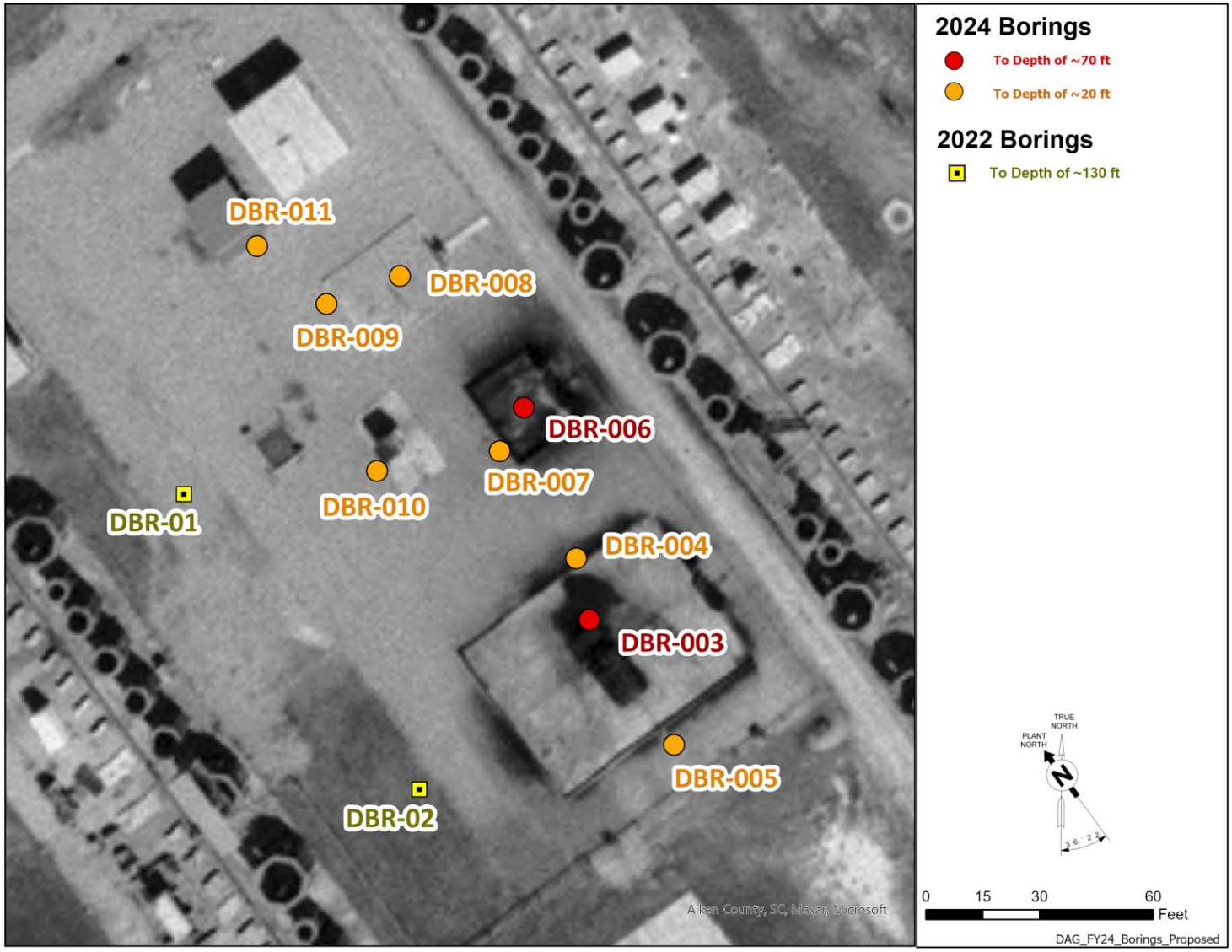


Figure 3. D-Area FFTA 2024 Sample Locations

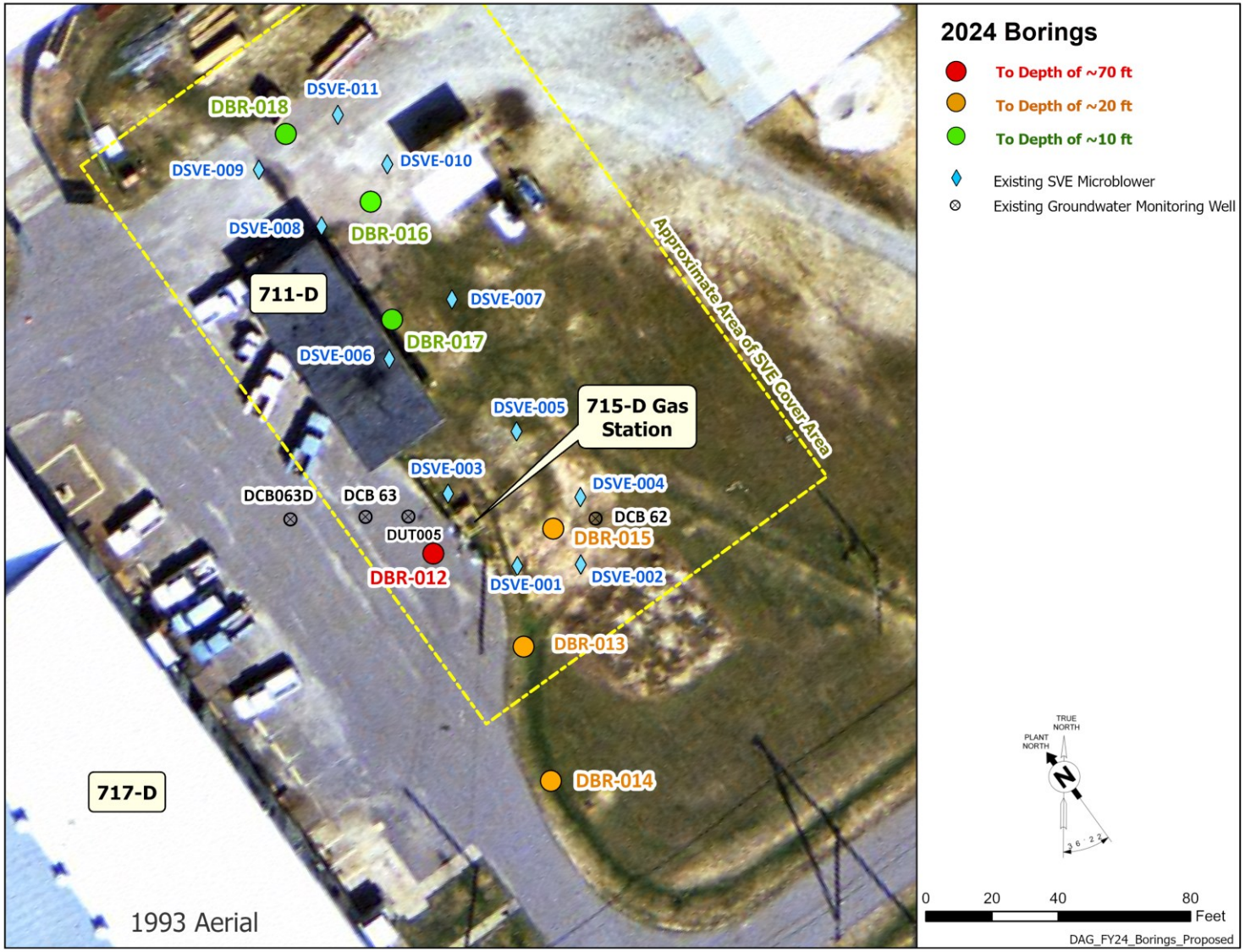


Figure 4. D-Area 715-D 2024 Gasoline Station Area Sample Locations

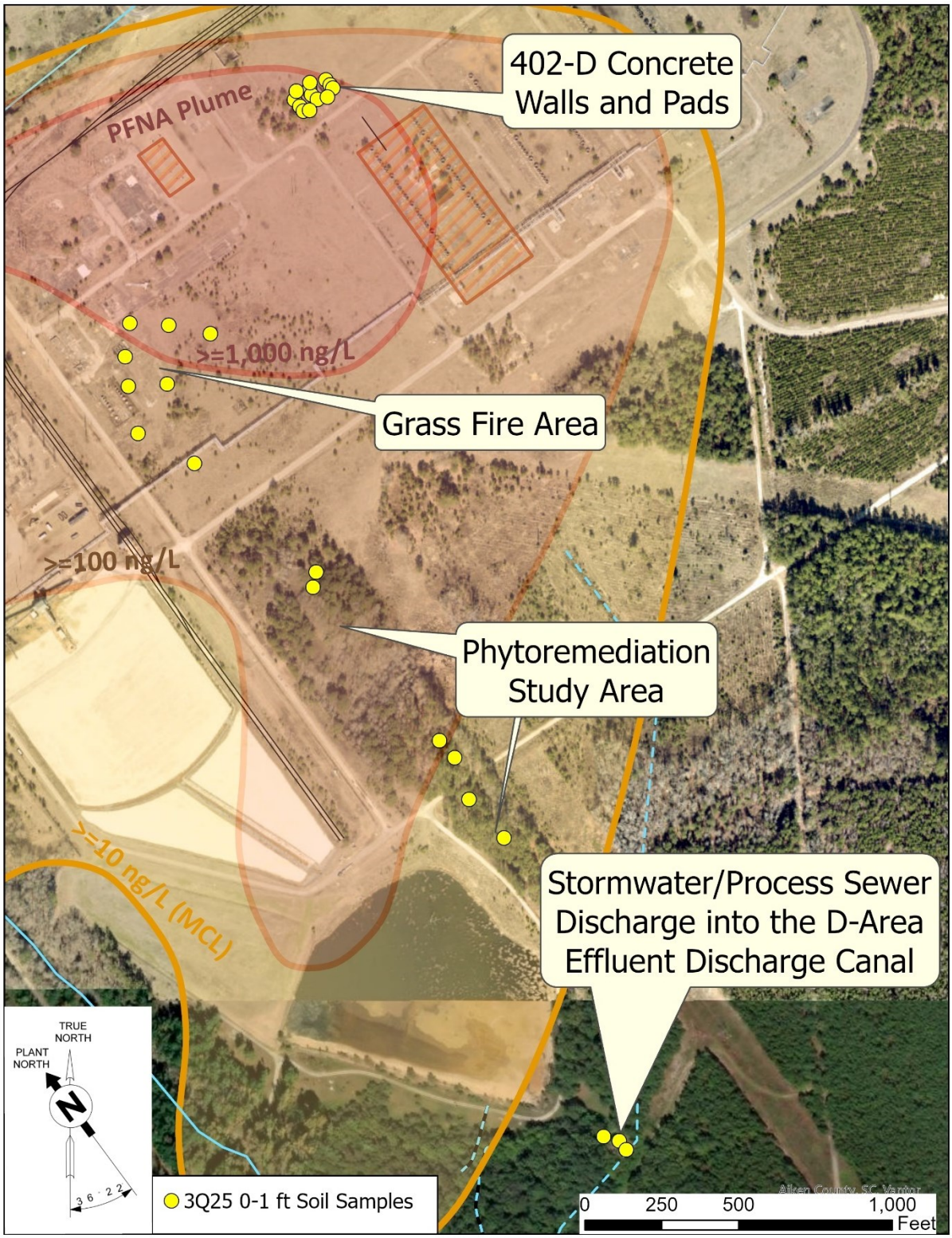


Figure 5. Four Potential PFAS Source Areas and Associated 0-1 ft Soil Sampling Locations Collected in 2025

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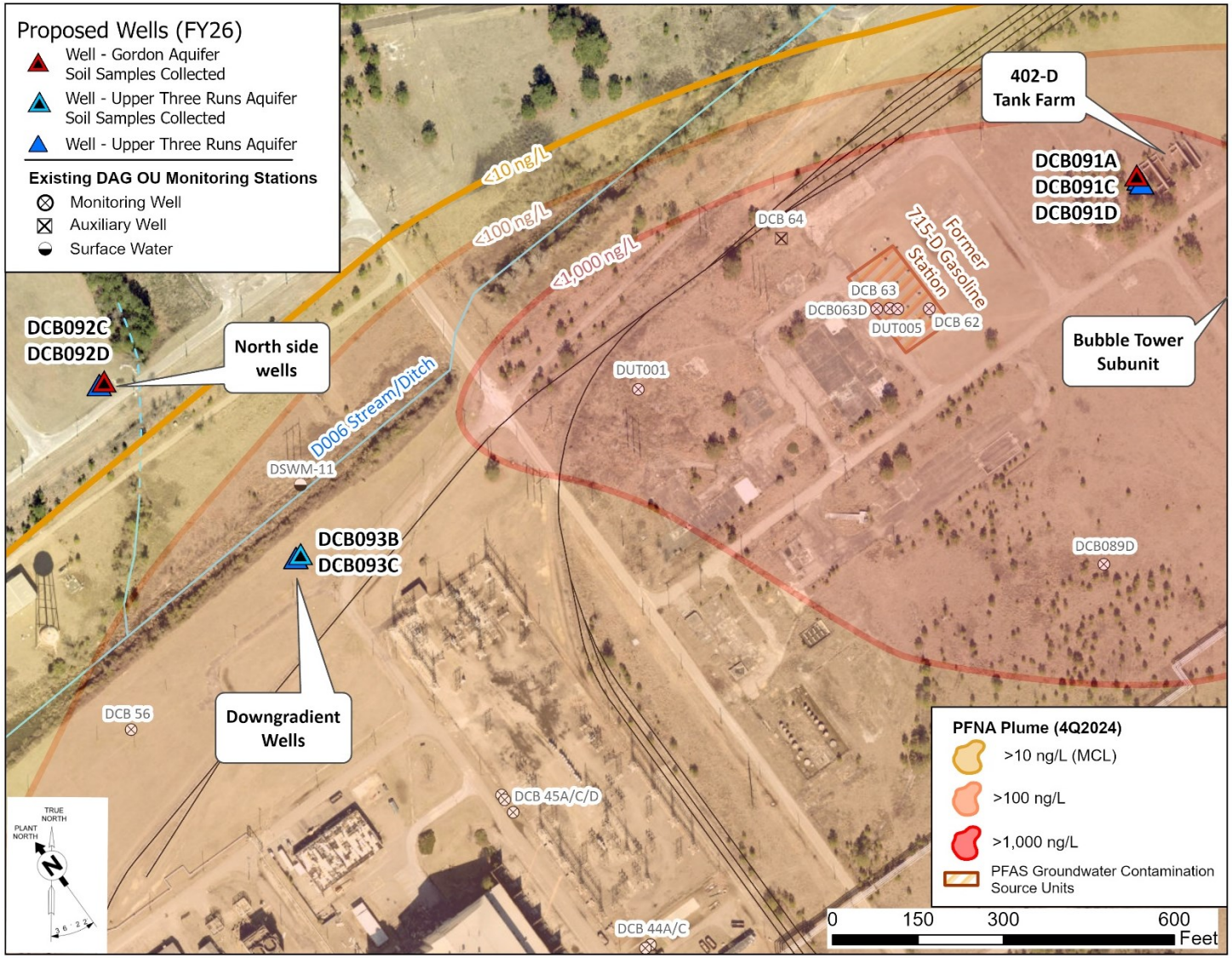


Figure 6. Proposed Groundwater Monitoring Well Locations

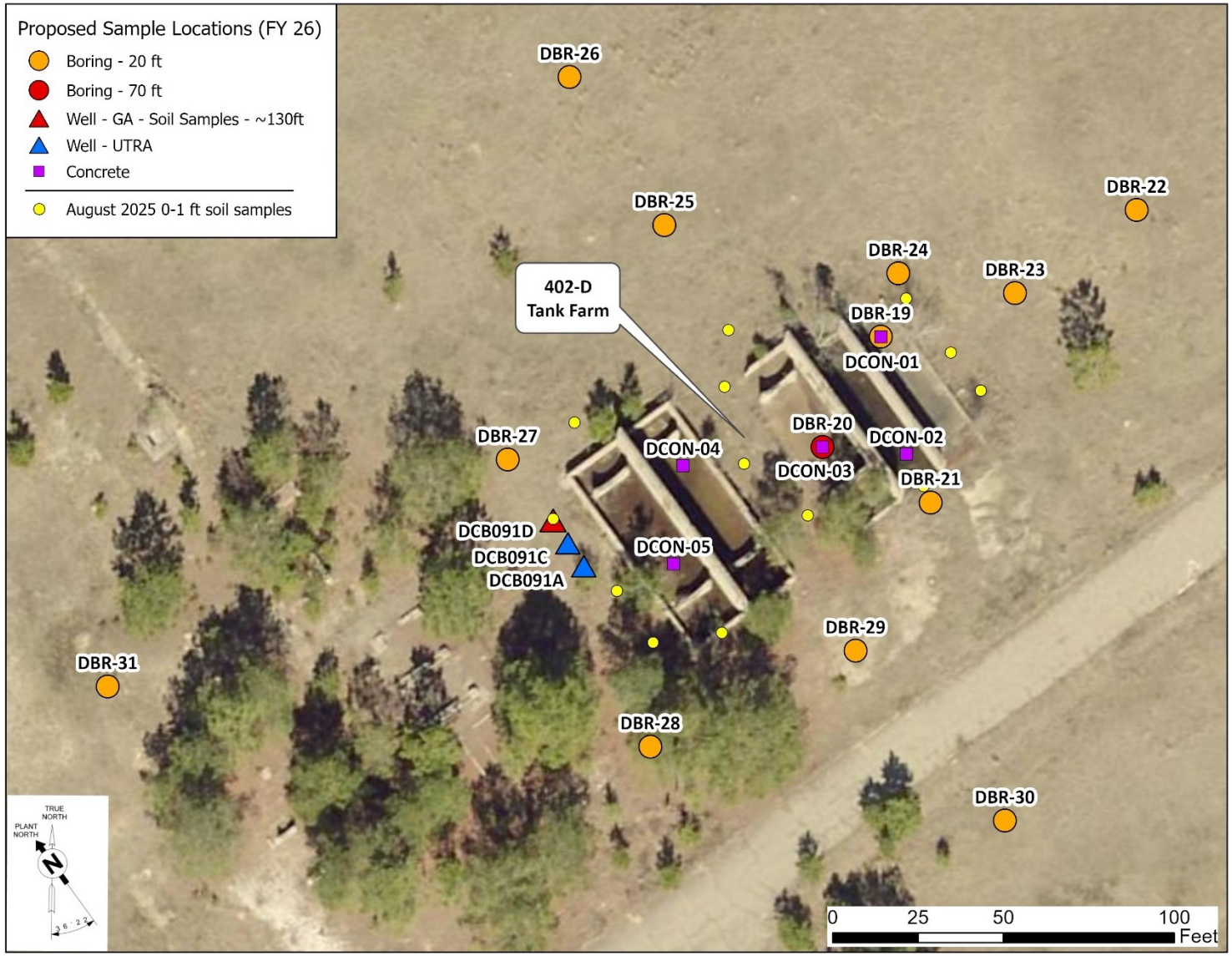


Figure 7. Proposed Groundwater Monitoring Wells and Soil Borings at the 402-D Tank Farm



Figure 8. Proposed Soil Borings at the Grass Fire Area

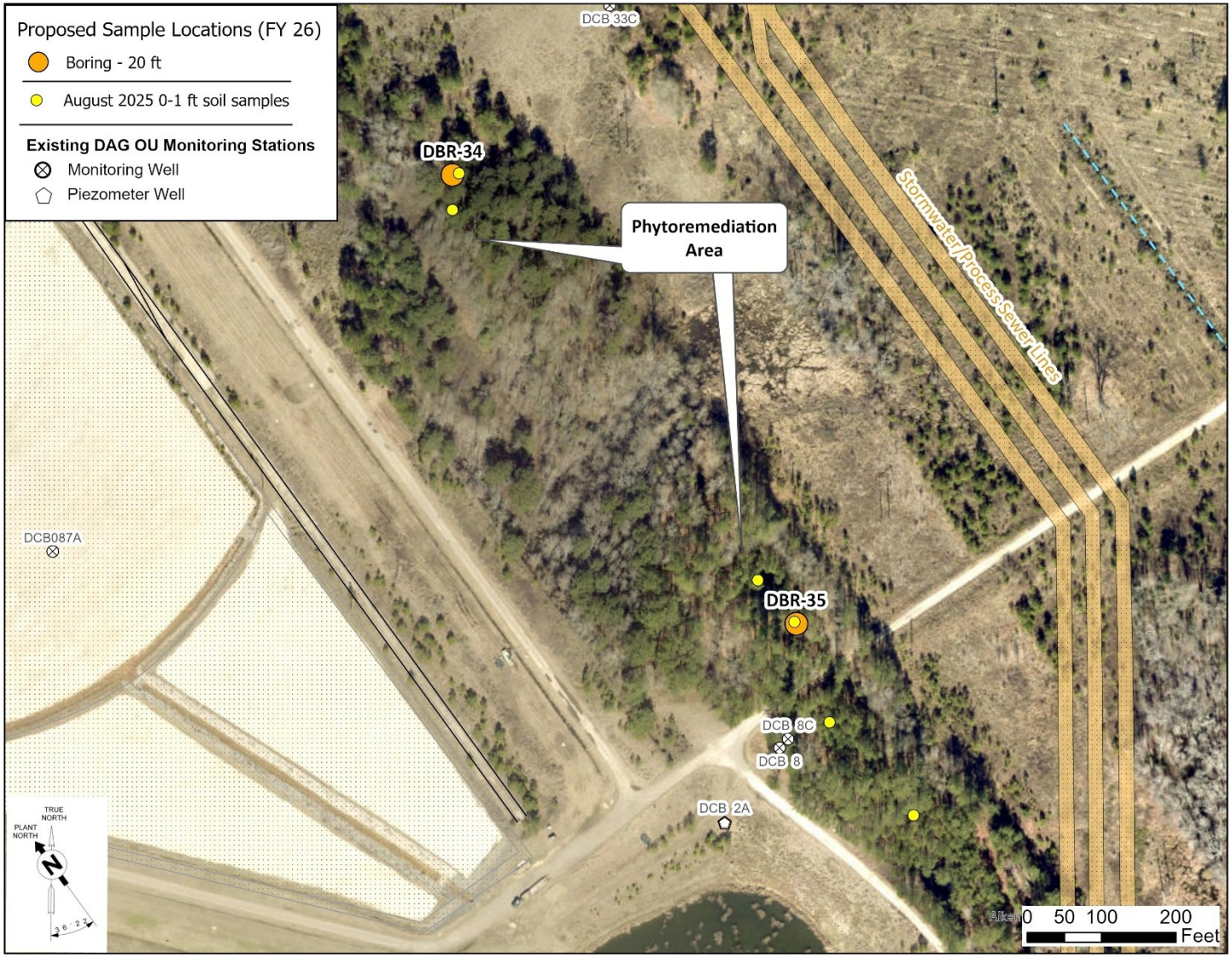


Figure 9. Proposed Soil Borings at the Phytoremediation Study Area

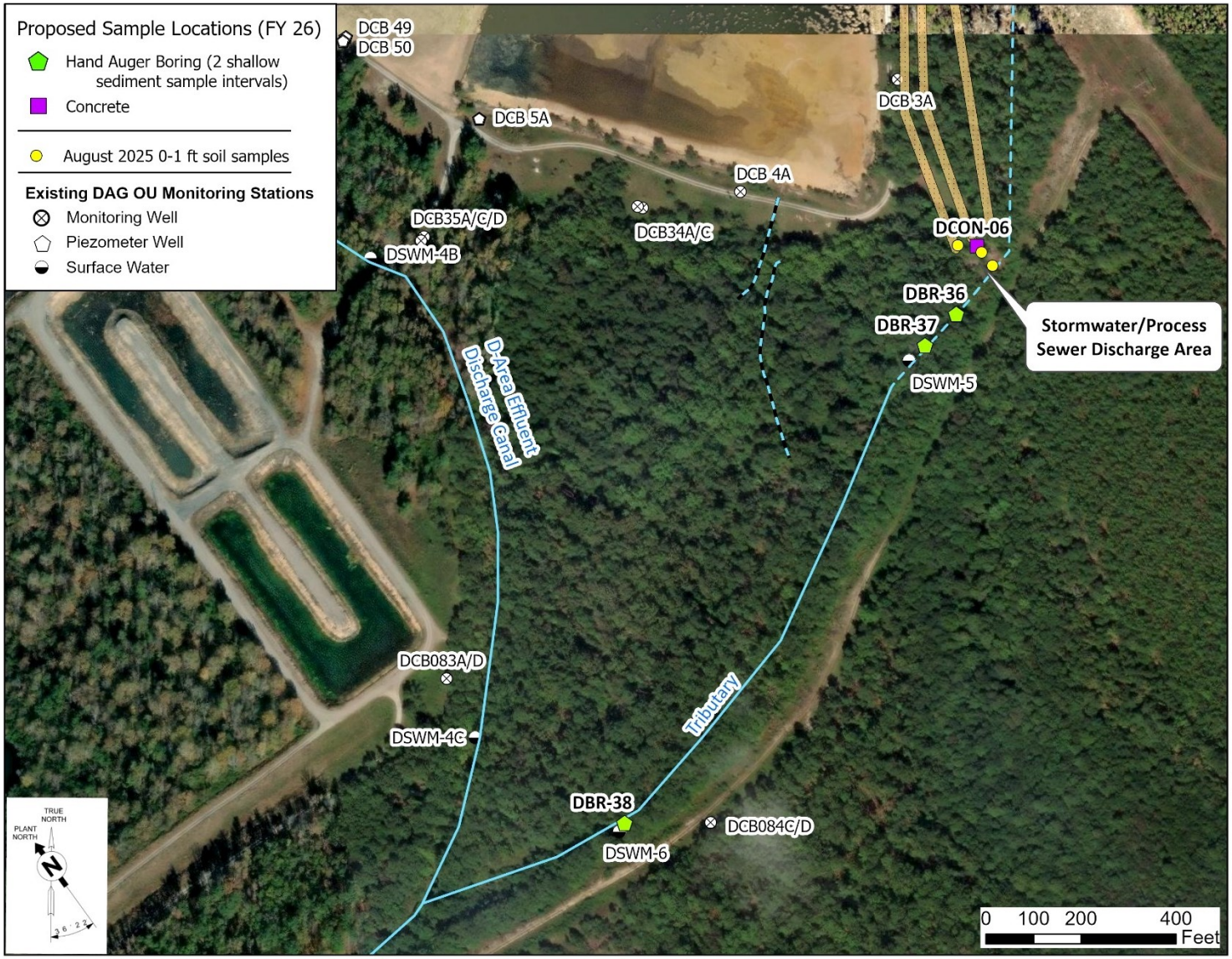


Figure 10. Proposed Soil Borings at the Stormwater/Process Sewer Discharge Area

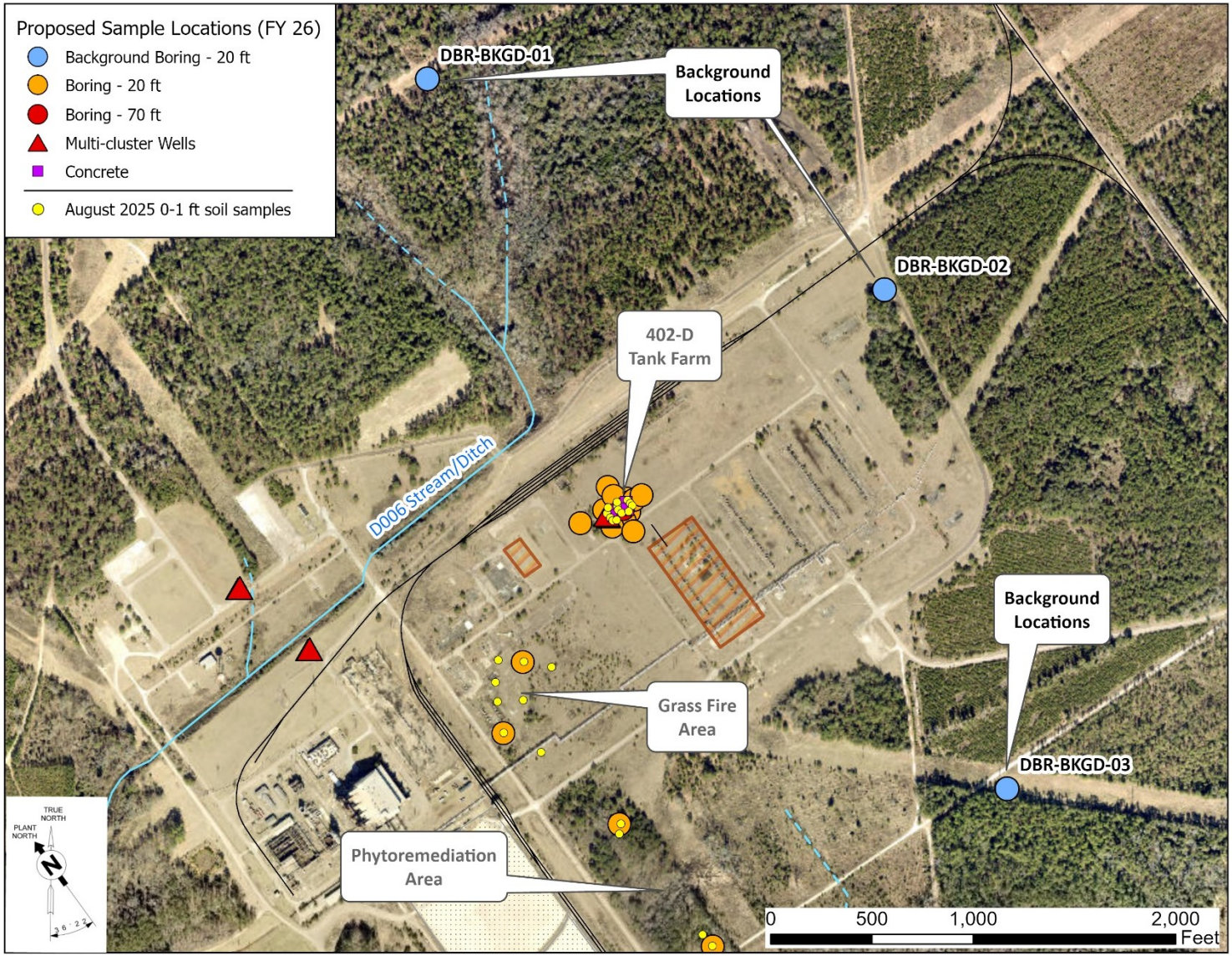


Figure 11. Proposed Background Sampling Locations

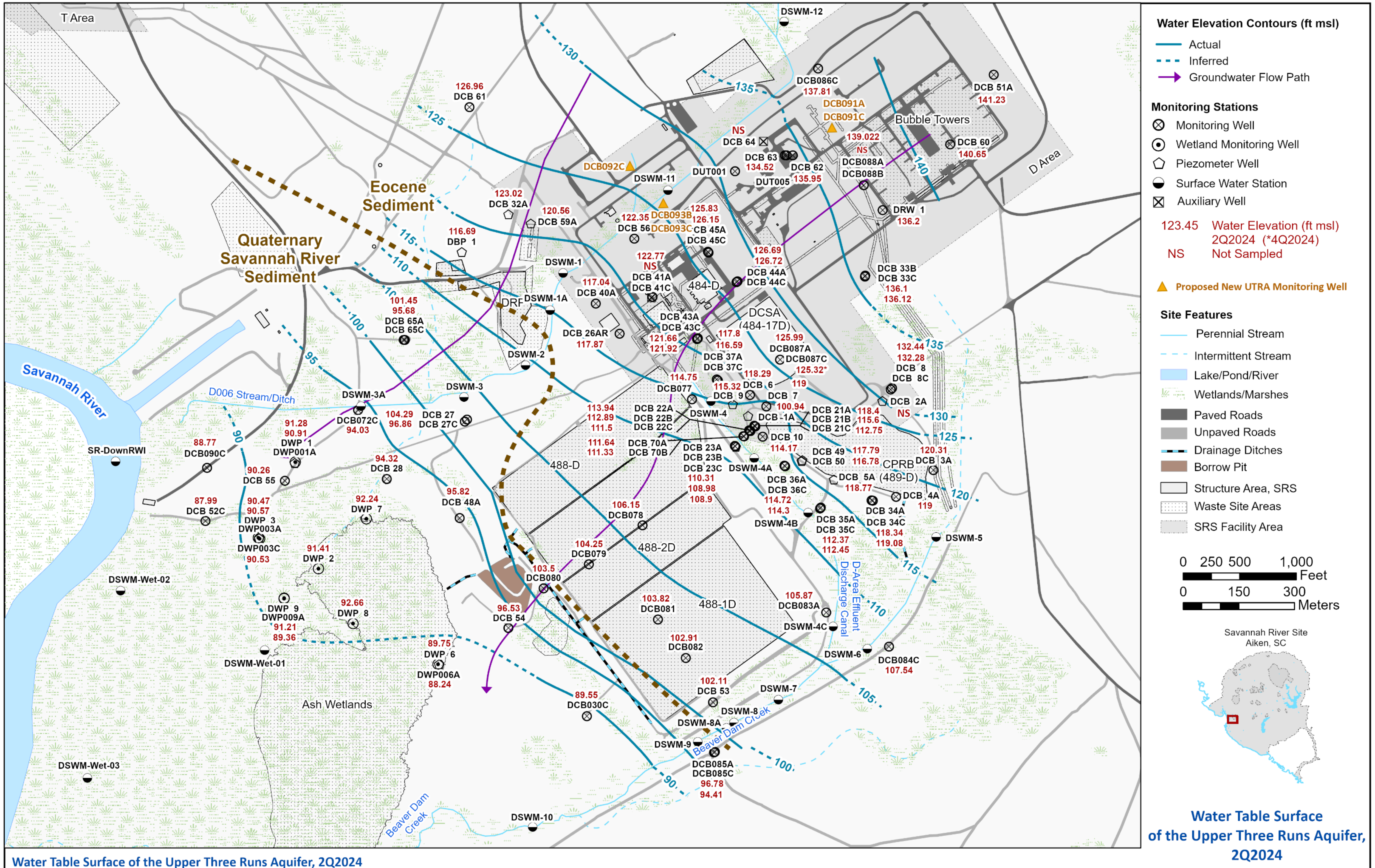


Figure 12. Potentiometric Surface of the Upper Three Runs Aquifer (2024)

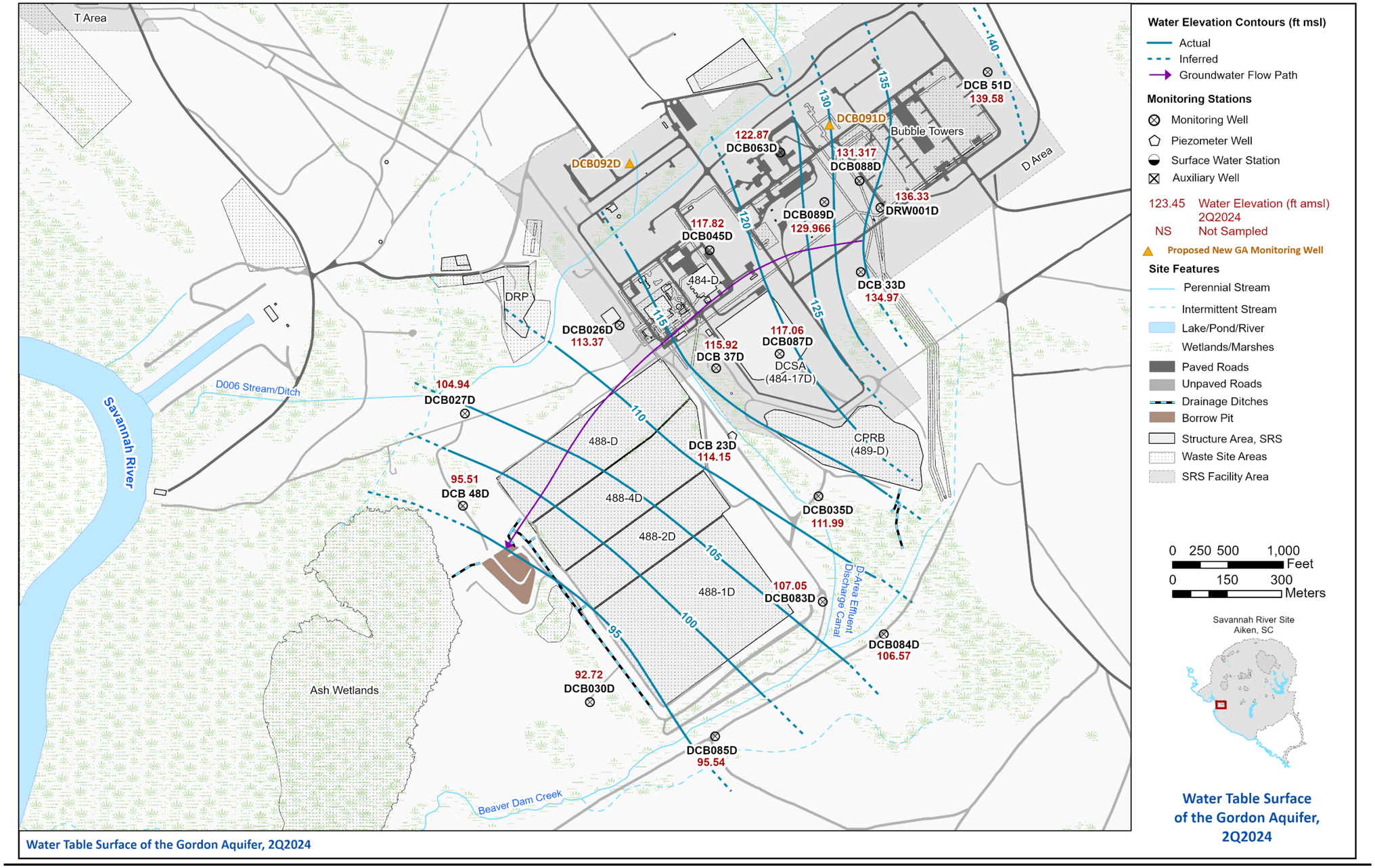


Figure 13. Potentiometric Surface of the Gordon Aquifer (2024)

Preliminary Conceptual Site Model for the D-Area Groundwater Operable Unit

Primary Source	Primary Release Mechanisms	Secondary Source	Secondary Release Mechanism	Exposure Media	Exposure Route	Potential Receptors: Human: Industrial Worker	Potential Receptors: Human: Resident	Potential Receptors: Ecological: Terrestrial	Potential Receptors: Ecological: Aquatic	COC[3]
D Area Facility Operations (includes DEXOU and DAOU)[1]	Operations// Spills/ Leaks/ Runoff/ Deposition/ Infiltration	Concrete/Soil (all depths)[2]	Infiltration/ Leaching/ Surface Runoff	Groundwater	Ingestion	—	○	—	—	GW plumes include 1) VOCs (i .e., PCE and TCE); 2) Tritium; 3) Metals (low pH) and; 4) PFAS
					Showering	—	○	—	—	
				Surface Water/ Sediment[4]		TBD	TBD	TBD	TBD	TBD	TBD

→	Pathways: current, historic, and/or future.
○	Complete exposure pathway for qualitative evaluation, (i.e., comparison to MCLs).
—	Incomplete exposure pathway.
1	Groundwater has been impacted by multiple sources within D Area, including subunits associated with the D-Area Expanded Operable Unit (DEXOU) and the D-Area Operable Unit (DAOU). Primary sources include 488-D Ash Basin, D-Area Coal Storage Area (484-17D), D- Area Coal Pile Runoff Basin (489-D), D-Area Rubble Pit (431-2D), D-Area Heavy Water Facility (411-D, 412-D and 413-D), 420-2D Heavy Water Rework Facility, 421-2D Moderator Handling and Storage Building, Fire Training Area (411-1D/411-3D), the Gasoline Station (715-D), the 402-D Tank Farm, Grass Fire Area, VOC Phytoremediation Area, and the Stormwater/Process water discharge area into tributary to the D-Area Effluent Discharge Canal.
2	Surface, subsurface, and deep soils either have been or will be addressed as subunits of the DEXOU and/or the DAOU and are not part of the DAG OU. Detailed CSMs are provided in the appropriate OU documentation.
3	Although a formal RFI/RI has not been performed, four distinct groundwater plumes have been identified for the DAG OU.
4	Surface water and/or sediment data to be formally evaluated in the Savannah River and Floodplain Swamp Integrator Operable Unit.
TBD	To Be Determined

Figure 14~~12~~. Conceptual Site Model

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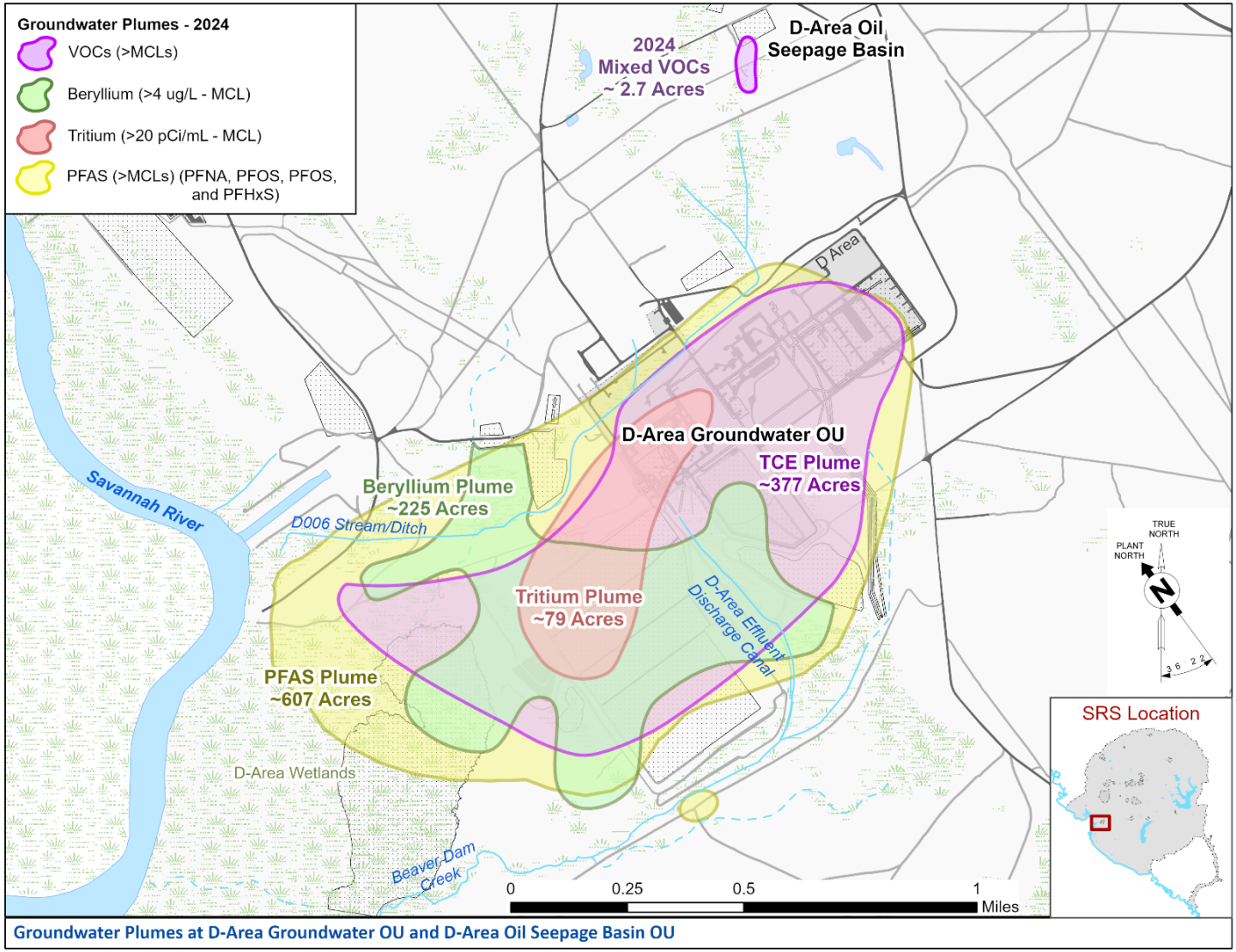


Figure ~~15~~13. D-Area Groundwater Plumes (2024)

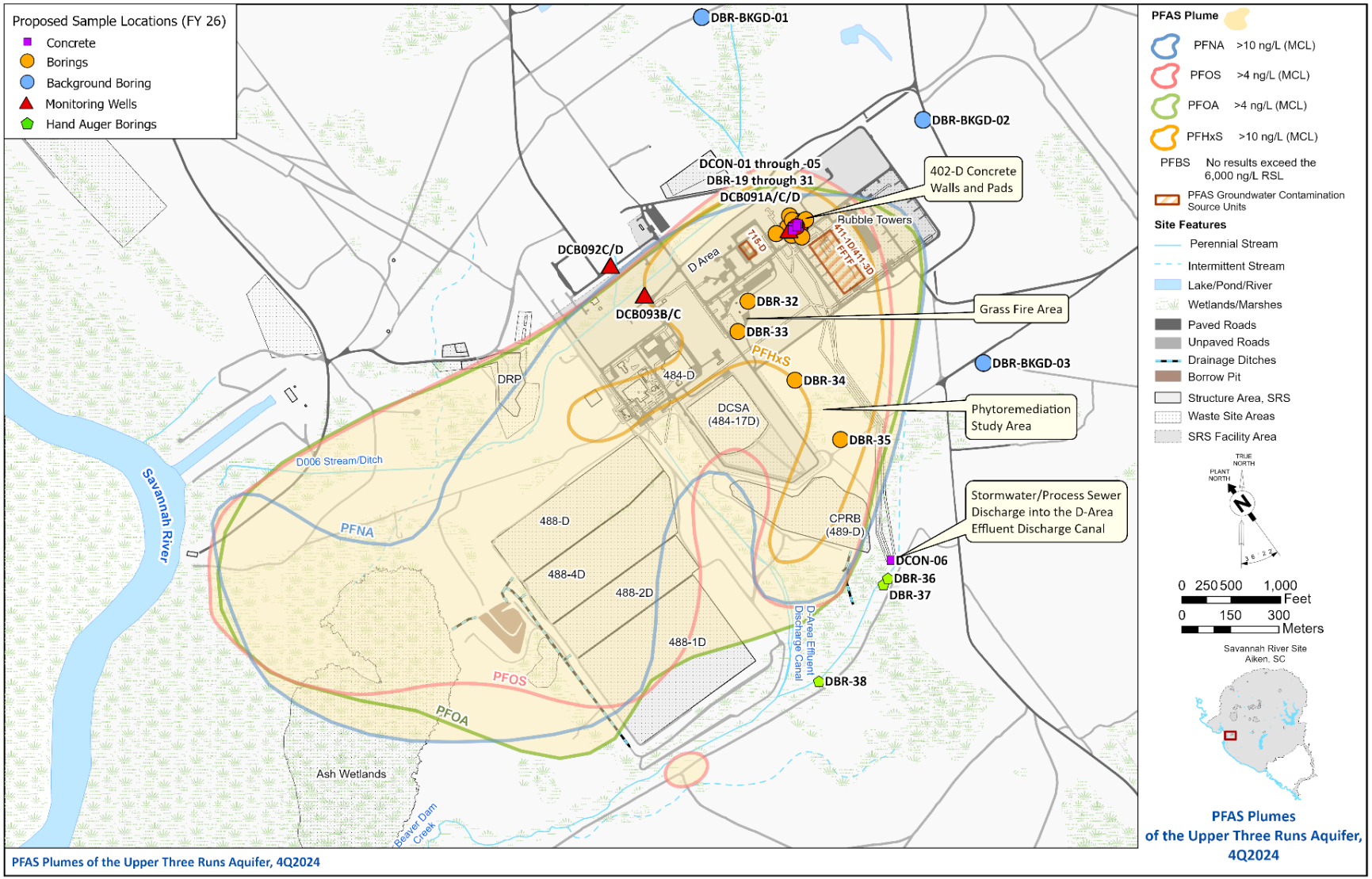
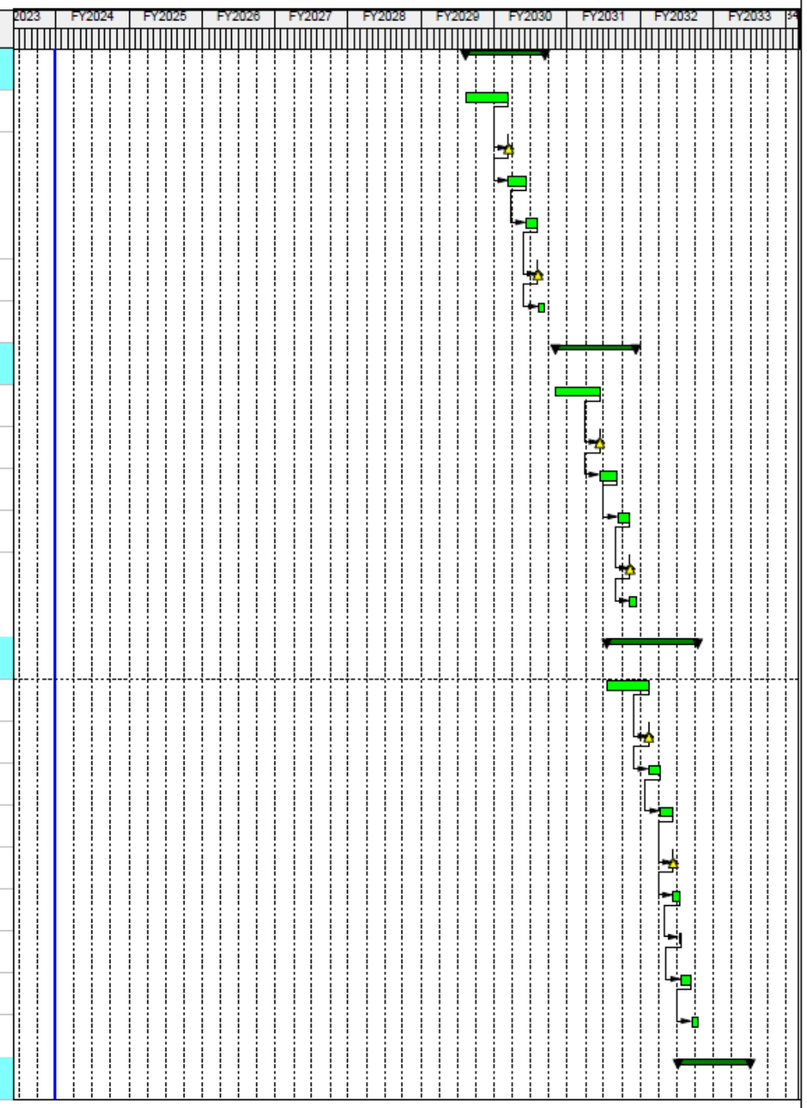


Figure 16. Combined PFAS Plumes in the Upper Three Runs Aquifer (4Q2024) with Potential Source Areas Identified

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#	Activity ID	Activity Name	Original Duration	Start	Finish
1	**3 - RFI / RI Report**		216d	7-May-2029	8-Jun-2030
2	DAGWOU07190	Develop D-Area Groundwater OU Revision 0 RFI/RI	120d	7-May-2029*	10-Dec-2029
3	DAGWOU07200	D-Area Groundwater OU Revision 0 RFI / RI Submittal	0d		10-Dec-2029
4	DAGWOU07210	EPA/SCDES Review Revision 0 RFI / RI	90d	11-Dec-2029	10-Mar-2030
5	DAGWOU07220	SRS Incorporate EPA/SCDES Comments	60d	11-Mar-2030	9-May-2030
6	DAGWOU07230	SRS Submit Rev. 1 RFI / RI	0d		9-May-2030
7	DAGWOU07240	EPA/SCDES Final Review & Approval of Rev. 1 RFI / RI	30d	10-May-2030	8-Jun-2030
8	**4- CMS / FS Report**		220d	1-Aug-2030	10-Sep-2031
9	DAGWOU07260	Develop D-Area Groundwater OU Revision 0 CMS/FS	120d	1-Aug-2030*	12-Mar-2031
10	DAGWOU07280	D-Area Groundwater OU Revision 0 CMS/FS Submittal	0d		12-Mar-2031
11	DAGWOU07290	EPA/SCDES Review Revision 0 CMS/FS	90d	13-Mar-2031	10-Jun-2031
12	DAGWOU07300	SRS Incorporate EPA/SCDES Comments	60d	11-Jun-2031	9-Aug-2031
13	DAGWOU07310	SRS Submit Rev. 1 CMS/FS	0d		9-Aug-2031
14	DAGWOU07320	EPA/SCDES Final Review & Approval of Rev. 1 CMS/FS	30d	12-Aug-2031	10-Sep-2031
15	**5 - Statement of Basis/Proposed Plan (SB/PP)**		248d	14-Apr-2031	12-Jul-2032
16	DAGWOU07340	Develop D-Area Groundwater OU Revision 0 SB/PP	120d	14-Apr-2031*	12-Nov-2031
17	DAGWOU07360	D-Area Groundwater OU Revision 0 SB/PP Submittal	0d		12-Nov-2031
18	DAGWOU07370	EPA/SCDES Review Revision 0 SB/PP	60d	13-Nov-2031	11-Jan-2032
19	DAGWOU07380	SRS Incorporate EPA/SCDES Comments	60d	12-Jan-2032	11-Mar-2032
20	DAGWOU07390	SRS Submit Rev. 1 SB/PP	0d		11-Mar-2032
21	DAGWOU07400	EPA/SCDES Final Review & Approval of Rev. 1 SB/PP	30d	12-Mar-2032*	10-Apr-2032
22	DAGWOU07410	Notification of Public Comment Proposed Plan	14d	11-Apr-2032	24-Apr-2032
23	DAGWOU07420	Public Comment Period	48d	25-Apr-2032	11-Jun-2032
24	DAGWOU07430	Develop Responsiveness Summary	29d	14-Jun-2032	12-Jul-2032
25	**6- ROD**		198d	5-Apr-2032	1-Apr-2033



Remaining Level of Effort
Actual Level of Effort
Actual Work
Actual Work Crit
Milestone
Remaining Work
% Complete
Baseline Milestone
Summary

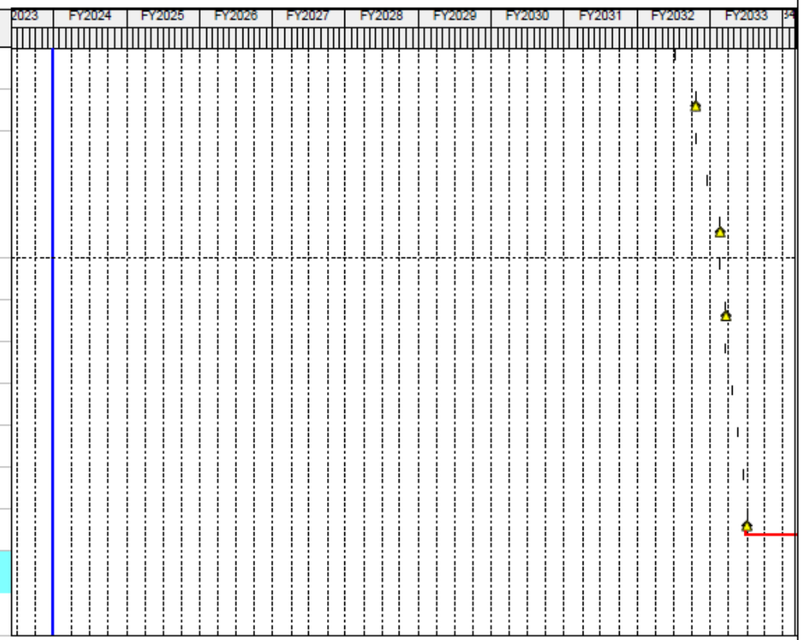
D - Area Groundwater OU Implementation Schedule

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Figure ~~17~~14. Implementation Schedule for the DAG OU

13-Jan-2026 16:22

#	Activity ID	Activity Name	Original Duration	Start	Finish
26	DAGWOU07440	Develop D-Area Groundwater OU Revision 0 ROD	60d	5-Apr-2032*	20-Jul-2032
27	DAGWOU07450	D-Area Groundwater OU Revision 0 ROD Submittal	0d		20-Jul-2032
28	DAGWOU07460	EPA/SCDES Review of ROD (Rev.0)	60d	21-Jul-2032	18-Sep-2032
29	DAGWOU07470	SRS Incorporate EPA/SCDES Comments	60d	19-Sep-2032	17-Nov-2032
30	DAGWOU07480	Submit ROD (Rev.1) to EPA/SCDES	0d		17-Nov-2032
31	DAGWOU07490	EPA/SCDES Final Review/Approval	30d	18-Nov-2032	17-Dec-2032
32	DAGWOU07500	Approval of ROD	0d		17-Dec-2032
33	DAGWOU07510	DOE Obtain Signature on ROD	30d	19-Dec-2032	17-Jan-2033
34	DAGWOU07520	SCDES obtain Signature on ROD	30d	18-Jan-2033	16-Feb-2033
35	DAGWOU07530	EPA obtain Signature on ROD	30d	17-Feb-2033	18-Mar-2033
36	DAGWOU07540	Prepare Public Notice	14d	19-Mar-2033	1-Apr-2033
37	DAGWOU07550	Issue ROD	0d		1-Apr-2033
38	**7 - RA Start**		0d	24-Jun-2034	24-Jun-2034
39	RASTART20	D-Area Groundwater OU Remedial Action Start	0d		24-Jun-2034*



Remaining Level of Effort
Actual Level of Effort
Actual Work
Actual Work Crit
Milestone
Remaining Work
% Complete
Baseline Milestone
Summary

D - Area Groundwater OU Implementation Schedule

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Figure ~~17~~14. Implementation Schedule for the DAG OU *(Continued/End)*

Table 1. Results from the 0-1 ft Soil Samples Collected in 2025

Max (ng/g) (ppb)

	Station	GENX	PFBA	PFBS	PFDA	PFDoA	PFHxA	PFHxS	PFNA	PFOA	PFOS	PFUnA
	Risk Based SSL (ng/g)	*0.061*	*6.5*	*3*	*0.000081*	*170*	*2.4*	*0.17*	*0.25*	*0.00004*	*0.015*	*45*
	MCL Based SSL (ng/g)	*0.01*	--	--	--	--	--	*0.0042*	*0.042*	*0.061*	*0.03*	--
Concrete Structure (402-D Tank Farm Remnants)	**DPFAS-01**	ND	ND	ND	0.22	0.17	ND	ND	0.093	ND	0.6	2.2
	DPFAS-02	ND	ND	ND	0.28	0.19	ND	ND	ND	ND	0.63	2.6
	DPFAS-03	ND	ND	ND	0.28	0.12	ND	ND	0.31	ND	0.63	2.4
	DPFAS-04	ND	0.11	ND	0.21	ND	0.047	ND	0.3	0.17	0.69	0.16
	DPFAS-05	ND	ND	ND	ND	ND	0.078	ND	0.091	0.15	0.23	0.11
	DPFAS-06	ND	ND	ND	ND	0.044	0.062	0.1	0.34	0.11	0.12	0.078
	DPFAS-07	ND	0.16	ND	0.4	2.5	0.099	0.14	0.19	0.095	0.43	200
	DPFAS-08	ND	ND	ND	0.067	0.43	ND	ND	0.13	ND	0.5	6.7
	DPFAS-09	ND	ND	ND	0.095	0.67	ND	ND	ND	ND	0.069	4.5
	DPFAS-10	ND	ND	ND	ND	0.41	ND	ND	0.076	ND	0.2	2
	DPFAS-11	ND	ND	ND	0.12	7.2	0.056	0.18	0.077	ND	0.41	26
	DPFAS-12	ND	ND	ND	ND	ND	ND	ND	0.076	ND	0.075	ND
	DPFAS-13	ND	ND	ND	0.82	0.85	ND	ND	2.6	ND	3.2	5.5
Grass Fire	**DPFAS-14**	ND	ND	ND	ND	ND	ND	ND	0.079	ND	0.25	ND
	DPFAS-15	ND	0.11	ND	0.16	ND	ND	ND	0.14	0.22	0.39	0.068
	DPFAS-16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	DPFAS-17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	DPFAS-18	ND	ND	ND	0.13	0.072	ND	ND	ND	0.036	0.32	0.31
	DPFAS-19	ND	ND	ND	0.11	ND	ND	ND	0.56	0.13	0.27	0.41
	DPFAS-20	ND	0.12	ND	ND	ND	ND	ND	0.11	0.1	0.26	0.09
	DPFAS-21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phyto	**DPFAS-22**	ND	ND	ND	ND	ND	ND	ND	0.24	ND	0.11	0.13
	DPFAS-23	ND	ND	ND	ND	ND	ND	ND	0.41	0.098	0.32	ND
	DPFAS-24	ND	ND	ND	ND	ND	ND	ND	0.069	ND	0.13	ND
	DPFAS-25	ND	ND	ND	0.06	ND	ND	ND	0.64	0.059	0.23	0.06
	DPFAS-26	ND	ND	ND	ND	0.037	ND	ND	0.17	0.066	0.25	0.075
	DPFAS-27	ND	ND	ND	ND	ND	ND	ND	0.071	ND	0.15	ND
SW/PS Dis.	**DPFAS-28**	ND	0.89	ND	1.9	1.4	0.62	0.57	2.6	1.3	3.9	15
	DPFAS-29	ND	0.5	ND	0.35	0.26	0.27	0.1	1.9	0.66	4.2	1
	DPFAS-30	ND	ND	ND	0.62	0.69	ND	ND	1.7	0.49	7.8	6.7
	Maximum Result	ND	0.89	ND	1.9	7.2	0.62	0.57	2.6	1.3	7.8	200
	Station with Maximum Result	--	DPFAS-28	--	DPFAS-28	DPFAS-11	DPFAS-28	DPFAS-28	DPFAS-13	DPFAS-28	DPFAS-30	DPFAS-07

--	Constituent not analyzed for. (Split samples were analyzed with method EPA533.)
ND	Not Detected
##	Detected
##	>MCL based SSL/Risk based SSL
##	>10x MCL based SSL/Risk based SSL
##	>100x MCL based SSL/Risk based SSL

Note: All results are from REG samples
Note: Concentrations are first compared to MCL based SSL, and if there is no MCL based SSL, then the Risk based SSL is used.
SW/PS Dis. = Stormwater/Process Sewer Discharge

Table 2. DAG OU Boring and Monitoring Well Proposed Sample Stations and Samples

Station ID	Area	Station Type	Aquifer	Longitude (UTM Zone 17 - NAD 83)	Latitude (UTM Zone 17 - NAD 83)	Screen Zone# *(ft bgs)*		Ground Elevation	Reference Elevation	Total Depth# *(ft bgs)*	VOCs	Tritium*	PFAS			pH and TOC
						Top Depth	Bottom Depth				GW	GW	GW	Soil	Concrete	Soil
DBR-019	Concrete Walls	Boring	UTRA	-81°44'9.33"	33°12'25.37"	--	--	146.68	--	20				X		X
DBR-020	Concrete Walls	Boring	UTRA	-81°44'9.48"	33°12'25.08"	--	--	146.65	--	70				X		X
DBR-021	Concrete Walls	Boring	UTRA	-81°44'9.11"	33°12'24.92"	--	--	146.59	--	20				X		X
DBR-022	Concrete Walls	Boring	UTRA	-81°44'8.40"	33°12'25.78"	--	--	147.04	--	20				X		X
DBR-023	Concrete Walls	Boring	UTRA	-81°44'8.82"	33°12'25.53"	--	--	146.55	--	20				X		X
DBR-024	Concrete Walls	Boring	UTRA	-81°44'9.22"	33°12'25.59"	--	--	146.84	--	20				X		X
DBR-025	Concrete Walls	Boring	UTRA	-81°44'10.03"	33°12'25.72"	--	--	146.56	--	20				X		X
DBR-026	Concrete Walls	Boring	UTRA	-81°44'10.36"	33°12'26.15"	--	--	145.89	--	20				X		X
DBR-027	Concrete Walls	Boring	UTRA	-81°44'10.56"	33°12'25.04"	--	--	146.89	--	20				X		X
DBR-028	Concrete Walls	Boring	UTRA	-81°44'10.06"	33°12'24.21"	--	--	146.73	--	20				X		X
DBR-029	Concrete Walls	Boring	UTRA	-81°44'9.29"	33°12'24.60"	--	--	146.44	--	20				X		X
DBR-030	Concrete Walls	Boring	UTRA	-81°44'8.87"	33°12'24.05"	--	--	146.45	--	20				X		X
DBR-031	Concrete Walls	Boring	UTRA	-81°44'11.93"	33°12'24.38"	--	--	145.22	--	20				X		X
DBR-032	Grass Fire	Boring	UTRA	-81°44'15.22"	33°12'17.57"	--	--	138.94	--	20				X		X
DBR-033	Grass Fire	Boring	UTRA	-81°44'16.42"	33°12'14.52"	--	--	137.24	--	20				X		X
DBR-034	Phytoremediation	Boring	UTRA	-81°44'9.55"	33°12'9.67"	--	--	136.94	--	20				X		X
DBR-035	Phytoremediation	Boring	UTRA	-81°44'4.05"	33°12'3.72"	--	--	136.09	--	20				X		X
DBR-036	Stormwater/ Process Water Discharge	Hand Auger	UTRA	-81°43'58.27"	33°11'49.86"	--	--	113.55	--	2				X		X
DBR-037	Stormwater/ Process Water Discharge	Hand Auger	UTRA	-81°43'58.81"	33°11'49.24"	--	--	114.14	--	2				X		X
DBR-038	Stormwater/ Process Water Discharge	Hand Auger	UTRA	-81°44'6.44"	33°11'39.48"	--	--	106.3	--	2				X		X
DBR-BKDG-01	Background	Boring	UTRA	-81°44'21.01"	33°12'46.05"	--	--	149.75	--	20				X		X
DBR-BKDG-02	Background	Boring	UTRA	-81°43'54.46"	33°12'35.90"	--	--	152.39	--	20				X		X
DBR-BKDG-03	Background	Boring	UTRA	-81°43'47.03"	33°12'11.53"	--	--	147.7	--	20				X		X
DCB091A	Concrete Walls	Monitoring Well	UTRA	-81°44'10.30"	33°12'24.74"	13	23	146.83	TBD	~25	X		X			
DCB091C	Concrete Walls	Monitoring Well	UTRA	-81°44'10.35"	33°12'24.80"	60	70	146.5	TBD	~75	X		X			
DCB091D	Concrete Walls	Monitoring Well	GA	-81°44'10.40"	33°12'24.87"	110	120	146.58	TBD	~130	X		X	X		X
DCB092C	North of D006	Monitoring Well	UTRA	-81°44'31.82"	33°12'21.11"	50	60	133.26	TBD	~75	X		X			
DCB092D	North of D006	Monitoring Well	GA	-81°44'31.72"	33°12'21.17"	110	120	133.24	TBD	~130	X		X	X		X
DCB093B	Downgradient of Bubble Towers	Monitoring Well	UTRA	-81°44'27.72"	33°12'18.14"	30	40	133.25	TBD	~~40~~45	X	X	X			
DCB093C	Downgradient of Bubble Towers	Monitoring Well	UTRA	-81°44'27.62"	33°12'18.21"	50	60	133.29	TBD	~75	X	X	X	X		X
DCON-01	Concrete Walls	Concrete	--	-81°44'9.33"	33°12'25.37"			146.68	--	--					X	
DCON-02	Concrete Walls	Concrete	--	-81°44'9.20"	33°12'25.06"			146.62	--	--					X	
DCON-03	Concrete Walls	Concrete	--	-81°44'9.48"	33°12'25.08"			146.65	--	--					X	
DCON-04	Concrete Walls	Concrete	--	-81°44'9.95"	33°12'25.03"			146.7	--	--					X	
DCON-05	Concrete Walls	Concrete	--	-81°44'9.99"	33°12'24.74"			146.7	--	--					X	
DCON-06	Stormwater/ Process Water Discharge	Concrete	--	-81°43'57.90"	33°11'55.66"			118.69	--	--					X	

*Tritium will be monitored for two sampling events. If detected, monitoring for tritium will be added on an annual basis.
#Screen zones lengths and depths and total depths of monitoring wells will be determined in the field based on lithology. Anticipated depths are listed.

Table 3. Potential ARARs and TBC Criteria for the DAG OU

ARAR/TBC	Type	Applicability
Federal		
Atomic Energy Act	Action/chemical-specific	Radioactive Waste
Resource Conservation and Recovery Act	Action/chemical-specific	Treatment, storage, and disposal of hazardous waste
Clean Air Act	Action/chemical-specific	Potential releases to air from units
Safe Drinking Water Act	Chemical-specific	MCLs and MCL goals
Clean Water Act	Action/chemical-specific	Discharge limitations
Toxic Substances Control Act	Action/chemical-specific	Potentially applicable if specific constituents are determined to be present
Federal Insecticide, Fungicide, and Rodenticide Control Act	Chemical-specific	Potentially applicable if specific pesticides are determined to be present
USDOE Orders	Action-specific	Treatment, storage, and disposal of hazardous and radioactive wastes
State		
SC Pollution Control Act	Action -specific	Potential releases to surface water, groundwater, air, or soil
SC Wastewater Regulations	Chemical-specific	Discharge limitations
SC Drinking Water Regulations	Chemical-specific	MCLs and MCL goals
SC Hazardous Waste Management Regulations	Action-specific	Treatment, storage, and disposal of hazardous and radioactive wastes
SC Air Pollution Control Regulations	Action-specific	Potential releases to air
SC Water Classification Standards	Chemical/location-specific	Surface water and groundwater classification
SC Well Standards	Action-specific	Well construction requirements

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Table 4. Proposed 402-D Tank Farm PFAS Soil/Concrete Samples

PFAS (Concrete/Soil)			Vadose Zone								Saturated Zone		
Station	Total Depth	Concrete	0-1	1-2	3-4	4-5	5-6	7-8	8-10	10-12	12-20	20-70	70-130
DBR-19, DCON-01	20	1	1		1		1		1		1		
DBR-20, DCON-03	70	1	1		1		1		1		1	5	
DCON-02	--	1											
DCON-04	--	1											
DCON-05	--	1											
DBR-21	20		1		1		1		1		1		
DBR-22	20		1		1		1		1		1		
DBR-23	20		1		1		1		1		1		
DBR-24	20		1		1		1		1		1		
DBR-25	20		1		1		1		1		1		
DBR-26	20		1		1		1		1		1		
DBR-27	20		1		1		1		1		1		
DBR-28	20		1		1		1		1		1		
DBR-29	20		1		1		1		1		1		
DBR-30	20		1		1		1		1		1		
DBR-31	20		1		1		1		1		1		
DCB091A	~25												
DCB091C	~~70~~75												
DCB091D	~130		1		1		1		1		1	5	5

Sample depth intervals will be determined in the field based on actual depth to groundwater, lithology, and core recovery.

Table 5. Proposed Grass Fire Area PFAS Soil Samples

PFAS (Soil)		Vadose Zone							Saturated Zone
Station	Total Depth	0-1	1-2	3-4	4-5	5-6	7-8	8-12	12-20
DBR-32	20		1		1		1	1	1
DBR-33	20		1		1		1	1	1

Sample depth intervals will be determined in the field based on actual depth to groundwater, lithology, and core recovery.

Table 6. Proposed Previous Phytoremediation Study Area PFAS Soil Samples

PFAS (Soil)		Vadose Zone							Saturated Zone
Station	Total Depth	0-1	1-2	3-4	4-5	5-6	7-8	8-12	12-20
DBR-34	20		1		1		1	1	1
DBR-35	20		1		1		1	1	1

Sample depth intervals will be determined in the field based on actual depth to groundwater, lithology, and core recovery.

Table 7. Proposed Stormwater/Process Sewer Discharge Area PFAS Sediment/Concrete Samples

PFAS (Concrete/Sediment)			Sediment (Saturated Zone)							
Station	Total Depth	Concrete	0-1	1-2	3-4	4-5	5-6	7-8	8-10	9-12
DCON-06		1								
DBR-36	2		1	1						
DBR-37	2		1	1						
DBR-38	2		1	1						

Table 8. Proposed Background PFAS Soil Samples

PFAS (Soil)		Vadose Zone							Saturated Zone
Station	Total Depth	0-1	1-2	3-4	4-5	5-6	7-8	8-12	12-20
DBR-BKGD-01	20	1		1		1		1	1
DBR-BKGD-02	20	1		1		1		1	1
DBR-BKGD-03	20	1		1		1		1	1

Sample depth intervals will be determined in the field based on actual depth to groundwater, lithology, and core recovery.

Table 9. Proposed Downgradient and North of D006 Wells PFAS Soil Samples

PFAS (Soil)		Vadose Zone								Saturated Zone	
Station	Total Depth	0-1	1-2	3-4	4-5	5-6	7-8	8-10	10-12	12-75	75-130
DCB092C	~~60~~75										
DCB092D	~130	1			1					5	3
DCB093B	~~60~~45										
DCB093C	~75	1			1					8	

Sample depth intervals will be determined in the field based on actual depth to groundwater, lithology, and core recovery.

Table 10. Data Quality Objectives Worksheet for D-Area Groundwater Operable Unit - Primary Source Material

Primary Sources	Probable Condition	Exposure Pathway and/or Release Mechanism	Data Needs and DQOs Including Engineering/Physical Processes	Field Activities including Removal and Characterization	Parameters	Potential Remedial Action Alternative
• 402-D Concrete Walls/Pad • Grass Fire Area • Stormwater/Process Sewer Discharge	Existing data show PFAS contamination in groundwater. Concrete could be contaminated at levels that pose a CM risk to soil and groundwater.	Exposure pathways within these source areas have been or will be addressed independently. PFAS has not yet been fully investigated. PFAS may still pose a CM risk to groundwater.	Provide data on the amount of concrete contamination to determine if CM risks to soil and groundwater exist.	Concrete sampling.	5% Definitive-level and 95% VV PFAS suite (method EPA 1633), pH, and TOC.	Potential DAOU Removal Action or Final Action for PFAS.

Table 11. Data Quality Objectives Worksheet for D-Area Groundwater Operable Unit - Secondary Source Material

Secondary Sources	Probable Condition	Exposure Pathway and/or Release Mechanism	Data Needs and DQOs including Engineering/Physical Processes	Field Activities Including Removal and Characterization	Parameters	Potential Remedial Action Alternative
• Soils within and adjacent to the 402-D Concrete Walls/Pad: • Grass Fire Area soils • Phytoremediation Study Area soils • Stormwater/Process Sewer Discharge soils	Based on existing data, PFAS have migrated into the subsurface from multiple source areas.	PFAS has not yet been fully investigated. PFAS may pose a CM risk to groundwater.	Provide data on the amount of soil contamination to determine if CM risks to groundwater exist. pH and TOC will aid in the groundwater model and PFAS sorption capacity.	Soil and sediment cores	5% Definitive-level and 95% VV soil PFAS suite, pH, and TOC.	Excavation, cover system, insitu treatment

Table 12. Data Quality Objectives Worksheet for D-Area Groundwater Operable Unit – Groundwater Pathway (Media)

Primary Sources	Probable Condition	Exposure Pathway and/or Release Mechanism	Data Needs and DQOs including Engineering/Physical Processes	Field Activities including Removal and Characterization	Parameters	Potential Remedial Action Alternative
• Groundwater	Contamination of groundwater from leaching and spills from primary sources. Contaminated groundwater exists. Plume commingled. Slow groundwater flow rates. Varying subsurface groundwater flow resulting in multiple plumes. Contaminated groundwater discharging into Beaver Creek and D-Area Discharge Canal.	Release mechanism is infiltration/leaching from soil	Primary sources inside D Area facilities that have contributed to tritium, TCE, pH/metals, and PFAS plumes have been identified and have been or will be addressed under separate actions. Provide data on level and extent of TCE, and PFAS contamination near high concentration portion of plume. Data will also support removal action design for PFAS treatment.	Install new monitoring wells. Collect groundwater samples.	VOC suite, PFAS, TOC, and pH data for water samples collected from new monitoring wells.	Alternatives include: monitored natural attenuation with LUCs, phytoremediation (tritium), targeted bioremediation (VOCs), and pH adjustment (pH/metals), PFAS reduction by carbon treatment; resin capsulation, etc (or other emerging remediation technologies), and groundwater and surface water monitoring

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Table 13. Laboratory Analytical Specifications and Contaminant Screening Levels Table for Analytes for Groundwater Media

Analyte	Analyte ID	Preparation Method [B]	Analytical Method [B]	CRDL [A]	TW RSL [C]	MCL [D]	Units
PFAS							
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	1633	EPA1633	0.21~~ (ng/L)~~	0.0027	4	ng/L
PERFLUOROOCTANE SULFONATE (PFOS)	1763-23-1	1633	EPA1633	0.25~~ (ng/L)~~	2	4	ng/L
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID (11CL-PF3OUDS)	763051-92-9	1633	EPA1633	0.87~~ (ng/L)~~	--	--	ng/L
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	1633	EPA1633	0.66~~ (ng/L)~~	--	--	ng/L
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID (9CL-PF3ONS)	756426-58-1	1633	EPA1633	0.67~~ (ng/L)~~	--	--	ng/L
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (GENX)	13252-13-6	1633	EPA1633	0.99~~ (ng/L)~~	15	10 (E)	ng/L
N-ETHYLPERFLUORO-1-OCTANESULFONAMIDOACETIC ACID (NEtFOSE)	2991-50-6	1633	EPA1633	0.29~~ (ng/L)~~	--	--	ng/L
N-METHYLPERFLUORO-1-OCTANESULFONAMIDOACETIC ACID (NMEFOSAA)	2355-31-9	1633	EPA1633	0.29~~ (ng/L)~~	--	--	ng/L
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	1633	EPA1633	0.09~~ (ng/L)~~	6,000	(E)	ng/L
PERFLUORODECANOIC ACID (PFDA)	335-76-2	1633	EPA1633	0.14~~ (ng/L)~~	0.04	--	ng/L
PERFLUORODODECANOIC ACID (PFDoA)	307-55-1	1633	EPA1633	0.11~~ (ng/L)~~	1,000	--	ng/L
PERFLUOROHEPTANOIC ACID (PFHpA)	375-85-9	1633	EPA1633	0.21~~ (ng/L)~~	--	--	ng/L
PERFLUOROHEXANESULFONIC ACID (PFHxS)	355-46-4	1633	EPA1633	0.18~~ (ng/L)~~	390	10 (E)	ng/L
PERFLUOROHEXANOIC ACID (PFHxA)	307-24-4	1633	EPA1633	0.14~~ (ng/L)~~	9,900	--	ng/L
PERFLUORONONANOIC ACID (PFNA)	375-95-1	1633	EPA1633	0.10~~ (ng/L)~~	59	10 (E)	ng/L
PERFLUOROTETRADECANOIC ACID (PFTA)	376-06-7	1633	EPA1633	0.27~~ (ng/L)~~	20,000	--	ng/L
PERFLUOROTRIDECANOIC ACID (PFTrDA)	72629-94-8	1633	EPA1633	0.19~~ (ng/L)~~	--	--	ng/L
PERFLUOROUNDECANOIC ACID (PFUnA)	2058-94-8	1633	EPA1633	0.25~~ (ng/L)~~	6,000	--	ng/L

A) CRDL is the Contract Required Detection Limit and is not always attainable.
B) Extraction and preparation methods differ depending upon media, concentration, instrument, laboratory, and analytical method. Preparation methods will also influence detection limits.
~~C) Laboratory instructed to obtain the lowest possible method detection limit.~~C) TW RSL is the USEPA tap water regional screening level.
D) MCL is the USEPA maximum contaminant level.
E) Contaminant is part of the USEPA hazard index MCL of one.

Table 13. Laboratory Analytical Specifications and Contaminant Screening Levels Table for Analytes for Groundwater Media *(Continued)*

Analyte	Analyte ID	Preparation Method [B]	Analytical Method [B]	CRDL [A]	TW RSL [C]	MCL [D]	Units
PFAS (continued; end)							
PERFLUORO(2-ETHOXYETHANE)SULFONIC ACID (PFEESA)	113507-82-7	1633	EPA1633	0.36 ~~(ng/L)~~	--	--	ng/L
NONAFLUORO-3,6-DIOXAHEPTANOIC ACID (NFDHA)	151772-58-6	1633	EPA1633	0.58 ~~(ng/L)~~	--	--	ng/L
PERFLUORO-N-PENTANOIC ACID (PFPeA)	2706-90-3	1633	EPA1633	0.18 ~~(ng/L)~~	--	--	ng/L
PERFLUORO-1-PENTANESULFONIC ACID (PFPES)	2706-91-4	1633	EPA1633	0.26 ~~(ng/L)~~	--	--	ng/L
1H, 1H, 2H, 2H-PERFLUOROOCTANE SULFONIC ACID (6:2 FTS)	27619-97-2	1633	EPA1633	2.02 ~~(ng/L)~~	--	--	ng/L
PERFLUORO-N-BUTANOIC ACID (PFBA)	375-22-4	1633	EPA1633	0.51 ~~(ng/L)~~	18,000	--	ng/L
PERFLUORO-1-HEPTANESULFONIC ACID (PFHPS)	375-92-8	1633	EPA1633	0.19 ~~(ng/L)~~	--	--	ng/L
PERFLUORO-3-METHOXYPROPANOIC ACID (PFMPA)	377-73-1	1633	EPA1633	0.18 ~~(ng/L)~~	--	--	ng/L
1H, 1H, 2H, 2H-PERFLUORODECANE SULFONIC ACID (8:2 FTS)	39108-34-4	1633	EPA1633	0.61 ~~(ng/L)~~	--	--	ng/L
1H,1H,2H,2H-PERFLUOROHEXANE SULFONIC ACID (4:2 FTS)	757124-72-4	1633	EPA1633	0.40 ~~(ng/L)~~	--	--	ng/L
PERFLUORO-4-METHOXYBUTANOIC ACID (PFMBA)	863090-89-5	1633	EPA1633	0.39 ~~(ng/L)~~	--	--	ng/L
N-ETHYL PERFLUOROOCTANE SULFONAMIDOETHANOL (NEtFOSE)	1691-99-2	1633	EPA1633	0.61 ~~(ng/L)~~	--	--	ng/L
N-METHYL PERFLUOROOCTANE SULFONAMIDOETHANOL (NMeFOSE)	24448-09-7	1633	EPA1633	0.63 ~~(ng/L)~~	--	--	ng/L
N-METHYLPERFLUORO-1-OCTANESULFONAMIDE (MEFOSA)	31506-32-8	1633	EPA1633	0.22 ~~(ng/L)~~	--	--	ng/L
PERFLUORO-1-DECANESULFONIC ACID (PFDS)	335-77-3	1633	EPA1633	0.16 ~~(ng/L)~~	--	--	ng/L
3-PERFLUOROPROPYL PROPANOIC ACID (3:3FTCA)	356-02-5	1633	EPA1633	0.60 ~~(ng/L)~~	--	--	ng/L
N-ETHYL PERFLUOROOCTANE SULFONAMIDE (NEtFOSA)	4151-50-2	1633	EPA1633	0.13 ~~(ng/L)~~	--	--	ng/L
PERFLUORO-1-NONANESULFONIC ACID (PFNS)	68259-12-1	1633	EPA1633	0.15 ~~(ng/L)~~	--	--	ng/L

A) CRDL is the Contract Required Detection Limit and is not always attainable.
B) Extraction and preparation methods differ depending upon media, concentration, instrument, laboratory, and analytical method. Preparation methods will also influence detection limits.
~~C) Laboratory instructed to obtain the lowest possible method detection limit.~~
C) TW RSL is the USEPA tap water regional screening level.
D) MCL is the USEPA maximum contaminant level.

Table 13. Laboratory Analytical Specifications and Contaminant Screening Levels Table for Analytes for Groundwater Media *(Continued; End)*

Analyte	Analyte ID	Preparation Method [B]	Analytical Method [B]	CRDL [A]	TW RSL [C]	MCL [D]	Units
PFAS (continued; end)							
PERFLUORO-1-OCTANESULFONAMIDE (PFOSA)	754-91-6	1633	EPA1633	0.20 ~~(ng/L)~~	--	--	ng/L
PERFLUORODODECANESULFONIC ACID (PFDoS)	79780-39-5	1633	EPA1633	0.15 ~~(ng/L)~~	--	--	ng/L
3-PERFLUOROHEPTYL PROPANOIC ACID (7:3FTCA)	812-70-4	1633	EPA1633	4.18 ~~(ng/L)~~	--	--	ng/L
2H,2H,3H,3H-PERFLUOROOCTANOIC ACID (5:3FTCA)	914637-49-3	1633	EPA1633	4.30 ~~(ng/L)~~	--	--	ng/L
Volatiles							
TETRACHLOROETHYLENE (PCE)	127-18-4	NA	EPA8260D	1 ~~(µg/L)~~	11	5	µg/L
TRICHLOROETHYLENE (TCE)	79-01-6	NA	EPA8260D	1 ~~(µg/L)~~	0.49	5	µg/L
1,1-DICHLOROETHYLENE	75-35-4	NA	EPA8260D	1 ~~(µg/L)~~	8.2	7	µg/L
CIS-1,2-DICHLOROETHYLENE	156-59-2	NA	EPA8260D	1 ~~(µg/L)~~	25	70	µg/L
TRANS-1,2-DICHLOROETHYLENE	156-60-5	NA	EPA8260D	1 ~~(µg/L)~~	68	100	µg/L
CHLOROETHENE (VINYL CHLORIDE)	75-01-4	NA	EPA8260D	2 ~~(µg/L)~~	0.019	2	µg/L
Radionuclides							
Tritium	10028-17-8	EPA900.0MOD	EPA900.0MOD	15 ~~(pCi/mL)~~	--	20	pCi/mL
pH							
pH	FIELD_pH	none	none	none [FD]	--	--	--
Total Organic Carbon (TOC)							
TOC	7440-44-0	Walkley-Black ASTM 706	EPA9060A	0.33 ~~mg/L~~	--	--	mg/L

A) CRDL is the Contract Required Detection Limit and is not always attainable.
B) Extraction and preparation methods differ depending upon media, concentration, instrument, laboratory, and analytical method. Preparation methods will also influence detection limits.
~~C) Laboratory instructed to obtain the lowest possible method detection limit.D)Field pH measurement range will be dependent on meter used.~~
C) TW RSL is the USEPA tap water regional screening level.
D) MCL is the USEPA maximum contaminant level.
F) Field pH measurement range will be dependent on meter used.

Table 14. Laboratory Analytical Specifications and Contaminant Screening Levels Table for Analytes for Soil/Concrete Media

Analyte	Analyte ID	Preparation Method [B]	Analytical Method [B]	CRDL [A]	MCL Based SSL [C]
PFAS					
PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	1633	EPA1633	0.03 ng/g	0.061 ng/g
PERFLUOROOCTANE SULFONATE (PFOS)	1763-23-1	1633	EPA1633	0.02 ng/g	0.03 ng/g
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID (11CL-PF3OUDS)	763051-92-9	1633	EPA1633	0.23 ng/g	--
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)	919005-14-4	1633	EPA1633	0.25 ng/g	--
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID (9CL-PF3ONS)	756426-58-1	1633	EPA1633	0.33 ng/g	--
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (GENX)	13252-13-6	1633	EPA1633	0.32 ng/g	0.01 ng/g
N-ETHYLPERFLUORO-1-OCTANESULFONAMIDOACETIC ACID (NEtFOSE)	2991-50-6	1633	EPA1633	0.04 ng/g	--
N-METHYLPERFLUORO-1-OCTANESULFONAMIDOACETIC ACID (NMEFOSAA)	2355-31-9	1633	EPA1633	0.04 ng/g	--
PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	1633	EPA1633	0.02 ng/g	--
PERFLUORODECANOIC ACID (PFDA)	335-76-2	1633	EPA1633	0.03 ng/g	--
PERFLUORODODECANOIC ACID (PFDoA)	307-55-1	1633	EPA1633	0.03 ng/g	--
PERFLUOROHEPTANOIC ACID (PFHpA)	375-85-9	1633	EPA1633	0.03 ng/g	--
PERFLUOROHEXANESULFONIC ACID (PFHxS)	355-46-4	1633	EPA1633	0.02 ng/g	0.0042 ng/g
PERFLUOROHEXANOIC ACID (PFHxA)	307-24-4	1633	EPA1633	0.02 ng/g	--
PERFLUORONONANOIC ACID (PFNA)	375-95-1	1633	EPA1633	0.03 ng/g	0.042 ng/g
PERFLUOROTETRADECANOIC ACID (PFTA)	376-06-7	1633	EPA1633	0.03 ng/g	--
PERFLUOROTRIDECANOIC ACID (PFTrDA)	72629-94-8	1633	EPA1633	0.04 ng/g	--
PERFLUOROUNDECANOIC ACID (PFUnA)	2058-94-8	1633	EPA1633	0.03 ng/g	--

A) CRDL is the Contract Required Detection Limit and is not always attainable.
B) Extraction and preparation methods differ depending upon media, concentration, instrument, laboratory, and analytical method. Preparation methods will also influence detection limits.
~~C) Laboratory instructed to obtain the lowest possible method detection limit.~~
C) MCL based SSL is the maximum contaminant level-based soil screening level.

Table 14. Laboratory Analytical Specifications and Contaminant Screening Levels Table for Analytes for Soil/Concrete Media *(Continued)*

Analyte	Analyte ID	Preparation Method [B]	Analytical Method [B]	CRDL [A]	MCL Based SSL [C]
PFAS (Continued; End)					
PERFLUORO(2-ETHOXYETHANE)SULFONIC ACID (PFEESA)	113507-82-7	1633	EPA1633	0.12 ng/g	--
NONAFLUORO-3,6-DIOXAHEPTANOIC ACID (NFDHA)	151772-58-6	1633	EPA1633	0.35 ng/g	--
PERFLUORO-N-PENTANOIC ACID (PFPeA)	2706-90-3	1633	EPA1633	0.04 ng/g	--
PERFLUORO-1-PENTANESULFONIC ACID (PFPES)	2706-91-4	1633	EPA1633	0.02 ng/g	--
1H, 1H, 2H, 2H-PERFLUOROOCTANE SULFONIC ACID (6:2 FTS)	27619-97-2	1633	EPA1633	0.17 ng/g	--
PERFLUORO-N-BUTANOIC ACID (PFBA)	375-22-4	1633	EPA1633	0.10 ng/g	--
PERFLUORO-1-HEPTANESULFONIC ACID (PFHPS)	375-92-8	1633	EPA1633	0.03 ng/g	--
PERFLUORO-3-METHOXYPROPANOIC ACID (PFMPA)	377-73-1	1633	EPA1633	0.12 ng/g	--
1H, 1H, 2H, 2H-PERFLUORODECANE SULFONIC ACID (8:2 FTS)	39108-34-4	1633	EPA1633	0.08 ng/g	--
1H,1H,2H,2H-PERFLUOROHEXANE SULFONIC ACID (4:2 FTS)	757124-72-4	1633	EPA1633	0.10 ng/g	--
PERFLUORO-4-METHOXYBUTANOIC ACID (PFMBA)	863090-89-5	1633	EPA1633	0.11 ng/g	--
N-ETHYL PERFLUOROOCTANE SULFONAMIDOETHANOL (NEtFOSE)	1691-99-2	1633	EPA1633	0.29 ng/g	--
N-METHYL PERFLUOROOCTANE SULFONAMIDOETHANOL (NMeFOSE)	24448-09-7	1633	EPA1633	0.21 ng/g	--
N-METHYLPERFLUORO-1-OCTANESULFONAMIDE (MEFOSA)	31506-32-8	1633	EPA1633	0.02 ng/g	--
PERFLUORO-1-DECANESULFONIC ACID (PFDS)	335-77-3	1633	EPA1633	0.03 ng/g	--
3-PERFLUOROPROPYL PROPANOIC ACID (3:3FTCA)	356-02-5	1633	EPA1633	0.21 ng/g	--
N-ETHYL PERFLUOROOCTANE SULFONAMIDE (NEtFOSA)	4151-50-2	1633	EPA1633	0.03 ng/g	--
PERFLUORO-1-NONANESULFONIC ACID (PFNS)	68259-12-1	1633	EPA1633	0.02 ng/g	--

A) CRDL is the Contract Required Detection Limit and is not always attainable.
B) Extraction and preparation methods differ depending upon media, concentration, instrument, laboratory, and analytical method. Preparation methods will also influence detection limits.
~~C) Laboratory instructed to obtain the lowest possible method detection limit.~~
C) MCL based SSL is the maximum contaminant level-based soil screening level.

Table 14. Laboratory Analytical Specifications and Contaminant Screening Levels Table for Analytes for Soil/Concrete Media *(Continued; End)*

Analyte	Analyte ID	Preparation Method [B]	Analytical Method [B]	CRDL [A]	MCL Based SSL [C]
PFAS (Continued; End)					
PERFLUORO-1-OCTANESULFONAMIDE (PFOSA)	754-91-6	1633	EPA1633	0.01 ng/g	--
PERFLUORODODECANESULFONIC ACID (PFDoS)	79780-39-5	1633	EPA1633	0.02 ng/g	--
3-PERFLUOROHEPTYL PROPANOIC ACID (7:3FTCA)	812-70-4	1633	EPA1633	1.73 ng/g	--
2H,2H,3H,3H-PERFLUOROOCTANOIC ACID (5:3FTCA)	914637-49-3	1633	EPA1633	1.41 ng/g	--
pH					
pH	FIELD_pH	9045	EPA 9045	none[D]	--
Total Organic Carbon (TOC)					
TOC	7440-44-0	Walkley-Black ASTM 706	EPA9060A	25.5 mg/kg	--

A) CRDL is the Contract Required Detection Limit and is not always attainable.
B) Extraction and preparation methods differ depending upon media, concentration, instrument, laboratory, and analytical method. Preparation methods will also influence detection limits.
~~C) Laboratory instructed to obtain the lowest possible method detection limit.~~C) MCL based SSL is the maximum contaminant level-based soil screening level.
D) Field pH measurement range will be dependent on meter used.

Table 15. Minimum Field Quality Control/Quality Assurance Sampling Requirements

Data Quality Level	Field Quality Control/Quality Assurance Samples	Frequency of Field Quality Control/ Quality Assurance Sample
UU	None	
VU	None	
VV	Co-located Field Duplicate	Minimum 5%[1]
	Trip Blank	Minimum 1 per cooler
	Equipment Blank	1 per 40 samples[2]
	Field Blank	Optional; 1 per 40 samples[3]
	Split Sample	Minimum 5%
SD	Co-located Field Duplicate	Minimum 5%[1]
	Trip Blank	1 per cooler
	Equipment Blank	1 per 40 samples[2]
	Field Blank	Optional; 1 per 40 samples[3]
	Split Sample	Minimum 5%
D	Co-located Field Duplicate	Minimum 5%[1]
	Trip Blank	1 per cooler
	Equipment Blank	1 per 40 samples[2]
	Field Blank	Optional; 1 per 40 samples[3]
	Split Sample	Minimum 5%

Data Quality Levels
UU Data Unverified and Unvalidated Data (no errors from CEDMS database loading screens)
VU Data Verified and Unvalidated Data (includes missing data checks)
VV Data Verified and Validated Data (validated to automated criteria; equivalent to USEPA Screening Level Data)
SD Data USEPA Screening Level Data with 10% Definitive Confirmation
D Data USEPA Definitive Level Data

Footnotes:
1 Minimum frequency established per ER-SOP-043
2 Typical frequency
3 Recommended based on project needs; typical frequency

Table 16. Preservatives, Holding Times, and Sample Containers

Parameter	Preservatives	Hold Times	Containers
Volatiles Method (Water)	Cool 0°C to 6°C, no chemical preservative, without headspace, 40-mL septum cap vial, G	7 Days	3 X 40 mL Vial, Zero headspace
Tritium	NR	180 Days	1 X 250 mL amber glass
PFAS (Water)	Cool 0-6°C OR ≤ -20°C	28 Days	2 X 500 ML & 1 X 125 ML HDPE
PFAS (Soil)	Cool 0-6°C OR ≤ -20°C	90 Days	1 X 125 ml HDPE
TOC (Water)	Cool 0-6°C, HCL	28 Days	1 x 250 mL Amber Glass
TOC (Soil/Concrete)	Cool 0-6°C	28 Days	1 X 4 fluid ounce clear glass
pH (Soil/Concrete)	None if taken immediately; if stored for later cool 6°C to 2°C	24 Hours	glass container (size not specified)

P = Polyethylene, G = Glass, HCL = Hydrochloric Acid, NDM = Not determined for this matrix, NR = None required

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Table 17. Proposed Required DAG OU Groundwater Monitoring Sampling and Frequency

Well ID	2Q	4Q	Well Use	Aquifer	Indicator Well	Applicable Threshold Limit	Proposed PFAS Sampling (4Q)
DBP 1	W	W	Piezometer	UTRA			
DCB 1A	W	W	Piezometer	UTRA			
DCB 2A	W	W	Piezometer	UTRA			
DCB 3A	Fp,M,Rd,S,V	W	Monitoring	UTRA			
DCB 4A	Fp,M,Rd,S,V	W	Monitoring	UTRA			
DCB 5A	W	W	Piezometer	UTRA			
DCB 6	Fp,U	W	Monitoring	UTRA			
DCB 7	Fp,U	W	Monitoring	UTRA			
DCB 8	Fp,M,S,T,U	W	Monitoring	UTRA			P
DCB 8C	Fp,M,S,U,V	W	Monitoring	UTRA			P
DCB 9	W	W	Piezometer	UTRA			
DCB 10	Fp,M,S,U	W	Monitoring	UTRA			
DCB 21A	Fp,Fe,M,Rd,S,U	~~Fp,Fe,M,Rd,S,U~~	Monitoring	UTRA	Source	M,U	
DCB 21B	Fp,Fe,M,Rd,S,U,V	~~Fp,Fe,M,Rd,S,U~~	Monitoring	UTRA	Source	M,U	
DCB 21C	Fp,Fe,M,Rd,S,U,V	~~Fp,Fe,M,Rd,S,U~~	Monitoring	UTRA	Source	M,U	
DCB 22A	Fp,Fe,M,Rd,S,U	~~Fp,Fe,M,Rd,S,U~~	Monitoring	UTRA			
DCB 22B	Fp,Fe,M,Rd,S,U	~~Fp,Fe,M,Rd,S,U~~	Monitoring	UTRA			
DCB 22C	Fp,Fe,M,Rd,S,U	~~Fp,Fe,M,Rd,S,U~~	Monitoring	UTRA			
DCB 23A	W	W	Piezometer	UTRA			
DCB 23B	Fp,M,S,U	W	Monitoring	UTRA			
DCB 23C	Fp,M,S,T,U	W	Monitoring	UTRA			
DCB 23D	W	W	Piezometer	GA			
DCB 26AR	Fp,M,S,T,V	W	Monitoring	UTRA	Source	T	P
DCB026D	Fp,M,S,T,V	W	Monitoring	GA			P
DCB 27	Fp,M,S,T,V	W	Monitoring	UTRA			P
DCB 27C	Fp,M,S,T,V	W	Monitoring	UTRA	Intermediate	V,T	P
DCB027D	Fp,M,S,T,V	W	Monitoring	GA			P
DCB 28	Fp,M,S,T,V	W	Monitoring	UTRA	Intermediate	V,T	
DCB030C	Fp,M,S,V	W	Monitoring	UTRA			P
DCB030D	Fp,M,S,V	W	Monitoring	GA			P
DCB 32A	W	W	Piezometer	UTRA			
DCB 33B	Fp,V	W	Monitoring	UTRA			P
DCB 33C	Fp,V	W	Monitoring	UTRA			P
DCB 33D	Fp,Rd,V	W	Monitoring	GA			P
DCB 34A	Fp,M,Rd,S,U,V	W	Monitoring	UTRA	Source	M,U	
DCB 34C	Fp,M,Rd,S,U,V	W	Monitoring	UTRA	Source	M,U	
DCB 35A	Fp,M,S,U,V	W	Monitoring	UTRA			
DCB 35C	Fp,M,S,U,V	W	Monitoring	UTRA			
DCB035D	Fp,M,S,U,V	W	Monitoring	GA			
DCB 36A	Fp,M,Rd,S,V	W	Monitoring	UTRA	Source	M,U	
DCB 36C	Fp,M,Rd,S,V	W	Monitoring	UTRA	Source	M,U	
DCB 37A	Fp,M,S,T,V	W	Monitoring	UTRA			
DCB 37C	Fp,M,S,T,V	W	Monitoring	UTRA			
DCB 37D	Fp,T,V	W	Monitoring	GA			
DCB 40A	Fp,T,V	W	Monitoring	UTRA			
DCB 41A	none	none	Auxiliary	UTRA			
DCB 41C	none	none	Auxiliary	UTRA			
DCB 43A	Fp,T	W	Monitoring	UTRA			
DCB 43C	Fp,T	W	Monitoring	UTRA			
DCB 44A	Fp,Rd,T, V	W	Monitoring	UTRA			
DCB 44C	Fp,Rd,T,V	W	Monitoring	UTRA			
DCB 45A	Fp,T,V	W	Monitoring	UTRA	Source	T	
DCB 45C	Fp,T,V	W	Monitoring	UTRA	Source	T	P
DCB045D	Fp,T,V	W	Monitoring	GA			P
DCB 48A	Fp,M,S,T,V	W	Monitoring	UTRA			P
DCB 48D	Fp,M,S,T,V	W	Monitoring	GA			P
DCB 49	W	W	Piezometer	UTRA			
DCB 50	W	W	Piezometer	UTRA			
DCB 51A	Fp,T,V	W	Monitoring	UTRA			P
DCB 51D	Fp,T,V	W	Monitoring	GA			P
DCB 52C	E,Fe,Fp,M,Rd,S,T,V	W	Monitoring	UTRA	Downgradient	V,T	P
DCB 53	Fp,M,Rd,S,T,V	W	Monitoring	UTRA			

Notes:
UTRA = Upper Three Runs Aquifer
GA = Gordon Aquifer
E = Ethene
Fe = ferric and ferrous iron
Fp = Field Parameters (collected during 2Q and 4Q sampling and included water-level, pH, turbidity, alkalinity)
M = metals (if chromium exceeds 100 µg/L, chromium-6+ will be analyzed during the next sampling event)
P = PFAS
Rd = REDOX/DO
S = sulfate
T = tritium
U = uranium
W = water-level measurement only
V = volatile organic compounds (PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, and vinyl chloride)
~~Fp,Fe,M,Rd,S,U~~ Proposed omissions
Proposed additions

Table 17. Proposed Required DAG OU Groundwater Monitoring Sampling and Frequency (*continued/end*)

Well ID	2Q	4Q	Well Use	Aquifer	Indicator Well	Applicable Threshold Limit	Proposed PFAS Sampling (4Q)
DCB 54	Fp,M,S,T,V	W	Monitoring	UTRA			
DCB 55	E,Fe,Fp,M,Rd,S,T,V	~~Fp,M,Rd,S~~	Monitoring	UTRA	Downgradient	V,T	
DCB 56	Fp,M,S,V	W	Monitoring	UTRA			
DCB 59A	W	W	Piezometer	UTRA			
DCB 60	Fp,M,S,V	W	Monitoring	UTRA			
DCB 61	Fp,M,S	W	Monitoring	UTRA			
DCB 62	Fp,V	W	Monitoring	UTRA	Source	V	P
DCB 63	Fp, T	W	Monitoring	UTRA			P
DCB063D	Fp, T, V	W	Monitoring	GA			P
DCB 64	none	none	Auxiliary	UTRA			
DCB 65A	Fp,M,S,T	W	Monitoring	UTRA			P
DCB 65C	Fp,M,S,T	W	Monitoring	UTRA			P
DCB 70A	Fp,Fe,M,Rd,S	~~Fp,Fe,M,Rd,S~~	Monitoring	UTRA			
DCB 70B	Fp,Fe,M,Rd,S	~~Fp,Fe,M,Rd,S~~	Monitoring	UTRA			
DCB072C	Fp,M,S,T,V	W	Monitoring	UTRA			
DCB077	Fp,M,S,T,V	W	Monitoring	UTRA			
DCB078	Fp,M,S,T,V	W	Monitoring	UTRA			P
DCB079	Fp,M,S,T,V	W	Monitoring	UTRA			
DCB080	Fp,M,S,T,V	W	Monitoring	UTRA			P
DCB081	Fp,M,S,T,V	W	Monitoring	UTRA			
DCB082	Fp,M,S,V	W	Monitoring	UTRA			
DCB083A	Fp,M,S	W	Monitoring	UTRA			
DCB083D	Fp,M,S	W	Monitoring	GA			
DCB084C	Fp,M,S	W	Monitoring	UTRA			
DCB084D	Fp,M,S	W	Monitoring	GA			
DCB085A	Fp,M,S	W	Monitoring	UTRA			P
DCB085C	Fp,M,S	W	Monitoring	UTRA			P
DCB085D	Fp,M,S	W	Monitoring	GA			
DCB086C	Fp,V	W	Monitoring	UTRA			
DCB087A	Fp,M,S,V	W	Monitoring	UTRA			P
DCB087C	Fp,M,S,V	W	Monitoring	UTRA			P
DCB087D	Fp,M,S,V	W	Monitoring	GA			P
DCB088A	Fp,V	W	Monitoring	UTRA			P
DCB088B	Fp,V	W	Monitoring	UTRA			P
DCB088D	Fp,V	W	Monitoring	GA			P
DCB089D	Fp,V	W	Monitoring	GA			
DCB090C	Fp,M,Rd,S,T,V	W	Monitoring	UTRA			P
DCB091A*	Fp, V	W	Monitoring	UTRA			P
DCB091C*	Fp, V	W	Monitoring	UTRA			P
DCB091D*	Fp, V	W	Monitoring	GA			P
DCB092C*	Fp, V	W	Monitoring	UTRA			P
DCB092D*	Fp, V	W	Monitoring	GA			P
DCB093B*	Fp, V, T[#]	W	Monitoring	UTRA			P
DCB093C*	Fp, V, T[#]	W	Monitoring	UTRA			P
DRW 1	Fp,T,V	W	Monitoring	UTRA	Source	V	P
DRW001D	Fp,T,V	W	Monitoring	GA			P
DUT001	~~none~~W	~~none~~W	Monitoring	UTRA			P
DUT005	Fp, V	W	Monitoring	UTRA			P
DWP 1	W	W	Wetland Piezometer	UTRA	Downgradient	M,U,V,T	
DWP001A	Fp,M,Rd,S,T,V	W	Wetland Monitoring	UTRA	Downgradient	M,U,V,T	
DWP 2	Fp,E,Fe,M,Rd,S,T,V	~~Fp,M,Rd,S~~	Wetland Monitoring	UTRA	Downgradient	M,U,V,T	
DWP 3	W	W	Wetland Piezometer	UTRA			
DWP003A	Fp,M,Rd,S,T,V	~~Fp,M,Rd,S~~	Wetland Monitoring	UTRA	Downgradient	V,T	
DWP003C	Fp,M,Rd,S,T,V	~~Fp,M,Rd,S~~	Wetland Monitoring	UTRA			
DWP 6	W	W	Wetland Piezometer	UTRA			
DWP006A	Fp,M,Rd,S,T,V	W	Wetland Monitoring	UTRA			P
DWP 7	Fp,E,Fe,M,Rd,S,T,V	W	Wetland Monitoring	UTRA			
DWP 8	Fp,M,Rd,S,T,V	~~Fp,M,Rd,S~~	Wetland Monitoring	UTRA	Downgradient	M,U	
DWP 9	Fp,M,Rd,S,T,V	W	Wetland Monitoring	UTRA	Downgradient	M,U	
DWP009A	Fp,M,Rd,S,T,V	W	Wetland Monitoring	UTRA			P

Notes:
UTRA = Upper Three Runs Aquifer
GA = Gordon Aquifer
E = Ethene
Fe = ferric and ferrous iron
Fp = Field Parameters (collected during 2Q and 4Q sampling and included water-level, pH, turbidity, alkalinity)
M = metals (if chromium exceeds 100 µg/L, chromium-6+ will be analyzed during the next sampling event)
P = PFAS
Rd = REDOX/DO
S = sulfate
T = tritium
U = uranium
W = water-level measurement only
V = volatile organic compounds (PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, and vinyl chloride)
*New monitoring well to be installed in FY26.
[#]Tritium will be sampled twice but is not expected to be detected and will not be continued to be sampled for annually unless it is detected.

~~Fp,Fe,M,Rd,S,U~~ Proposed omissions
Proposed addition

Table 18. Proposed Required Annual DAG OU Surface Monitoring Sampling

Well ID	Analytes	UTM East (m)	UTM North (m)	Proposed PFAS Sampling (4Q)
DSWM-1	Tritium, TCE, TAL Metals	430638.0	3673869.0	
DSWM-1A♠	none	430603.0	3673769.2	P
DSWM-2	Tritium, TCE, TAL Metals	430537.0	3673620.7	
DSWM-3	Tritium, TCE, TAL Metals	430371.0	3673534.9	
DSWM-3A♠	none	430093.4	3673510.1	P
DSWM-4	Tritium, TCE, TAL Metals	431036.9	3673523.6	P
DSWM-4A	TAL Metals	431153.4	3673370.5	
DSWM-4B	TAL Metals	431298.6	3673223.4	
DSWM-4C	TAL Metals	431365.7	3672916.4	
DSWM-5	TCE, TAL Metals	431643.9	3673157.8	
DSWM-6	TCE, TAL Metals	431458.1	3672856.2	P
DSWM-7	TCE, TAL Metals	431218.6	3672718.9	
DSWM-9	TAL Metals	431001.3	3672605.3	
DSWM-10	TAL Metals	430556.0	3672375.9	P
DSWM-11♠	none	430920.9	3674092.5	P
DSWM-12♠	none	431233.9	3674546.8	P
DSWM-Wet-01♠	none	429833.6	3672852.4	P
DSWM-Wet-02♠	none	429445.3	3673012.9	P
DSWM-Wet-03♠	none	429355.6	3672508.1	P
RM-116♠	none	422774.2	3676869.2	P
SR-UpgradientD♠	none	428855.9	3673827.5	P
SR-DownRWI♠	none	429431.6	3673361.2	
SR-DownDArea♠	none	428894.7	3672159.3	P
BDC-Mouth♠	none	428677.2	3669744.3	P
SR-DownBDCMouth♠	none	428776.7	3669596.0	P

All UTM coordinates are in NAD 27 Zone 17.

♠ Station was added for PFAS sampling.

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