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**WSRC-RP-2000-4134**  
**February 2002**

**H-AREA GROUNDWATER OPERABLE UNIT  
SCOPING SUMMARY (U)**

**Westinghouse Savannah River Company**  
**Savannah River Site**  
**Aiken, SC 29808**



**KEY CHANGES IN THIS SCOPING SUMMARY**

<b>Section</b>	<b>Description of Change</b>	<b>Reason for Change / Agreement</b>
1.0	Section 1 was updated (at paragraphs 1, 4, 5, and 6).	These changes capture the project chronology and accurately reflect the status of the HAGOU Work Plan.
5.0	Section 5 was revised at paragraphs 1 and 2.	These changes make the Scoping Summary consistent with the accompanying Rev.1.2 HAGOU Work Plan and accurately reflect the status of the HAGOU Work Plan
Table 1	Table 1 was moved from page 4 to page 3. The content of the table was not changed.	This change took advantage of white space in the previous document.

## **1.0 Project Phase and Status of H-Area Groundwater OU Scoping Summary**

In May 1999, prior to completing Revision 1.2 of the Corrective Measures Study/Feasibility Study (CMS/FS), the H-Area Tank Farm Groundwater Operable Unit was placed into Federal Facility Agreement schedule suspension while regulatory and programmatic issues were resolved. A Core Team of representatives from the United States Department of Energy-Savannah River Operations Office (DOE-SRS), Region IV of the United States Environmental Protection Agency (USEPA), and the South Carolina Department of Health and Environmental Control (SCDHEC) met in January 2000 to review characterization results for the H-Area Tank Farm Groundwater Operable Unit. At this meeting, the Core Team reviewed data from new wells installed (in 1998-1999) in and around the H-Area Tank Farm. The team agreed that:

- There is no discernable contaminant plume associated with H-Area Tank Farm.
- A Mixing Zone is therefore not needed in the absence of a definable plume.
- A new, expanded groundwater operable unit would be defined.
- Continued groundwater monitoring is necessary.

The H-Area Tank Farm Groundwater Operable Unit was originally composed of various historical spills and leaks in the H-Area Tank Farm; one spill and one leak had the potential to negatively affect groundwater. The first spill was a release from Tank 16 in 1960. The other was a leak from the Concentrate Transfer System (CTS) line at Tank 37 that occurred 1989. Both Tank 16 and the Tank 37 CTS line have since been emptied and removed from service. Both of these spills occurred in the heavy industrial zone within H-Area. The other recorded spills were less significant; there was little potential for affecting groundwater and these spills were cleaned up immediately.

In April 2000, the Core Team agreed to eliminate the milestones for the H-Area Tank Farm Groundwater Operable Unit and to create a new groundwater monitoring strategy and a schedule of milestones for a larger H-Area Groundwater Operable Unit (HAGOU). This new operable unit was designed to include the groundwater systems associated with H-Area Tank Farm and other operating facilities and waste units.

SRS submitted a focused work plan for the HAGOU in October 2000. Comments received from SCDHEC and USEPA were resolved during a Core Team meeting on April 18, 2001. At this meeting, the Core Team also agreed that groundwater associated with other nearby waste units could be incorporated into the HAGOU, and that the boundaries and monitoring strategy for the HAGOU will be revised as necessary. In May 2001, SRS submitted a Rev.1 Work Plan that captured this Core Team decision and addressed other comments on the Rev.0 Work Plan.

In July 2001, the Core Team agreed that groundwater associated with three operable units – H-Area Retention Basin [HRBOU], Warner's Pond [WPOU], and HP52 Ponds [HP52OU], all being consolidated into closure of the Old Radioactive Waste Burial Ground – should be included in the HAGOU, and that the boundaries and the monitoring strategy for the HAGOU should be revised to accommodate these units. The team also determined that a revised Work Plan should be submitted to capture these changes.

SRS submitted the Rev.1.1 Work Plan and associated Scoping Summary in September 2001. Comments received on the Rev.1.1 Work Plan have been addressed in the Rev.1.2 Work Plan, which this Scoping Summary accompanies.

## **2.0 Background**

H-Area is located on a topographical high near the center of SRS. S-Area is located to the immediate northeast of H-Area. The HAGOU encompasses H-Area, S-Area, and general site areas. The boundaries of the HAGOU, established by the Core Team during the April 2000 meeting, are roughly coincident with McQueen Branch to the east; HRBOU and HP52OU to the south; WPOU and Crouch Branch to the west; and S-Area and tributaries of Crouch Branch to the north (Figure 1). The HAGOU includes not only the H-Area Tank Farm, but also waste units and other operating facilities that could potentially introduce contaminants to the shallow aquifers that underlie the OU.

The objective of the HAGOU strategy is to monitor groundwater quality in the two uppermost aquifers that underlie the OU and that discharge to Upper Three Runs Creek, Fourmile Branch, or their tributaries. The Upper Three Runs Aquifer (UTRA) is the shallowest aquifer beneath HAGOU. A semi-continuous confining unit (the "tan clay" confining zone) divides the UTRA into an upper aquifer zone (UAZ) and a lower aquifer zone (LAZ). A more continuous aquitard – the Gordon Confining Unit – underlies the LAZ and confines the Gordon Aquifer.

**3.0 Land Use**

The area encompassed by the HAGOU is heavily developed with many active industrial facilities. No future residential use of this area is anticipated. Any remedial actions that may be necessary will be developed with the expectation that future land use will be industrial. Any contaminants of concern (COCs) that are identified by long term monitoring will be addressed by remedial strategies and/or land-use controls as a part of the industrial land use scenario. These controls will be specified in the final action for the HAGOU.

**4.0 Groundwater Exposure Group**

The HAGOU includes groundwater in the UTRA and Gordon Aquifer. Soils, sediments, and surface water are not considered as part of the HAGOU. These media will be addressed separately during closure of the various waste units and operating facilities.

**4.1 Problem Warranting Remedial Action**

Characterization and pre-characterization data show that several volatile organic compounds (VOCs), radionuclides, and metals are present in the UTRA at levels that sometimes exceed maximum contaminant levels (MCLs). However, these exceedances are temporally sporadic or geographically localized, and no definable plumes appear to emanate from any single operating facility or waste unit. Therefore, there is no problem that requires remedial action at this time. However, the Core Team agreed that further monitoring is necessary to assess the scope of groundwater contamination that may exist or develop at the HAGOU.

**4.2 Scope of Problem**

The nature, magnitude, and extent of contamination will be determined by monitoring groundwater quality in both the UTRA and the Gordon Aquifer. The Core Team agreed on the well network, sampling frequency, and analytes listed in Table 1. The team also agreed to convene annually to review data and to modify the well network, sampling frequency, and analyte list as necessary.

**4.3 Remedial Action Objective (RAO)**

The Core Team agreed that there is no problem that requires remedial action. Therefore, no remedial action objectives were developed for the HAGOU.

**4.4 Likely Response Action / Interim Action**

No remedial action is required at this time. The Core Team agreed that a monitoring strategy is appropriate to determine the nature and extent of groundwater contamination at the HAGOU. The Core Team agreed to the well network, sampling frequency, and analyte list summarized in Table 1. (The analytes listed in Table 1 are based on characterization data for H-Area Tank Farm and HRBOU and pre-characterization data for WPOU and HP52OU.)

**4.5 Uncertainty**

Many operating facilities and waste units exist within the boundaries of the HAGOU. Individually and collectively, these facilities and waste sites could contaminate the shallow aquifers that underlie the HAGOU. Because of the large number and wide areal distribution of potential contaminant sources, there is and will continue to be some uncertainty regarding the source(s) of contaminants in shallow groundwater. This is true for historic, on-going, and future releases to groundwater. However, the HAGOU monitoring strategy was carefully developed to provide multiple downgradient monitoring points in both the UTRA and the Gordon Aquifer, and to provide a system of early-warning (proximal) and contingency (distal) wells to monitor groundwater contamination. The nature and extent of existing

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groundwater contamination, and the existence of any definable contaminant plumes, are also somewhat uncertain. These uncertainties will be managed by monitoring the groundwater quality and adjusting the HAGOU well network, sampling frequency, and analyte list as necessary.

WELL NETWORK	SAMPLING FREQUENCY	ANALYTE LIST
<p><b>UAZ of UTRA:</b> HAA-5D, HAA-9D, HAA-11D, HAA-12D, HAA-13D, HAA-14D, HAA-15D, HCB-2, HTF-12D HTF-15D, SBG-6, and 4 new* HGW wells</p> <p><b>Gordon Aquifer:</b> HAA-9AR, HAA-11A, HAA-12A, HAA-13A, HAA-14A, HAA-15A, and 1 new* HGW well to be installed; 2 additional A wells to be installed if required by Core Team decision</p> <p><i>*Well locations and screen zones for new HGW wells were included in SRS's request for new wells.</i></p>	<p><b>Semi-annual</b></p> <p>All wells will be sampled semi-annually for the first two years; thereafter sampling frequency will be determined by annual Core Team review.</p>	<p><b>Select Radionuclides</b></p> <ul style="list-style-type: none"> <li>• tritium</li> <li>• non-volatile beta activity</li> </ul> <p><b>Select VOCs</b></p> <ul style="list-style-type: none"> <li>• 1,1,1-trichloroethane</li> <li>• 1,1-dichloroethane</li> <li>• carbon tetrachloride</li> <li>• trichloroethylene</li> </ul> <p><b>Select Metals</b></p> <ul style="list-style-type: none"> <li>• lead</li> <li>• cadmium</li> </ul> <p><b>Field Parameters**</b></p>
<p><b>HRBOU Wells</b></p> <p><b>UAZ of UTRA:</b> HR3-16DU, HR3-15DU</p>		<p><b>Select Radionuclides</b></p> <ul style="list-style-type: none"> <li>▪ tritium</li> <li>▪ non-volatile beta activity</li> <li>▪ gross alpha activity</li> </ul> <p><b>Field Parameters**</b></p>
<p><b>WPOU Wells</b></p> <p><b>UAZ of UTRA:</b> HSL-3D*, HSL-4D*, HR8-11 <i>*currently monitored to fulfill F&amp;H RCRC Part B Permit requirements</i></p>		<p><b>Select Radionuclides</b></p> <ul style="list-style-type: none"> <li>▪ tritium</li> <li>▪ non-volatile beta activity</li> </ul> <p><b>Field Parameters**</b></p>
<p><b>HP52OU Wells</b></p> <p><b>UAZ of UTRA:</b> HHP-1D, HHP-2D</p>		<p><b>Select Radionuclides</b></p> <ul style="list-style-type: none"> <li>▪ tritium</li> <li>▪ non-volatile beta activity</li> </ul> <p><b>Field Parameters**</b></p>

**\*\*Note:** Field parameters include pH, specific conductivity, temperature, turbidity, and depth to water.

**Table 1: Elements of the HAGOU Groundwater Monitoring Plan**

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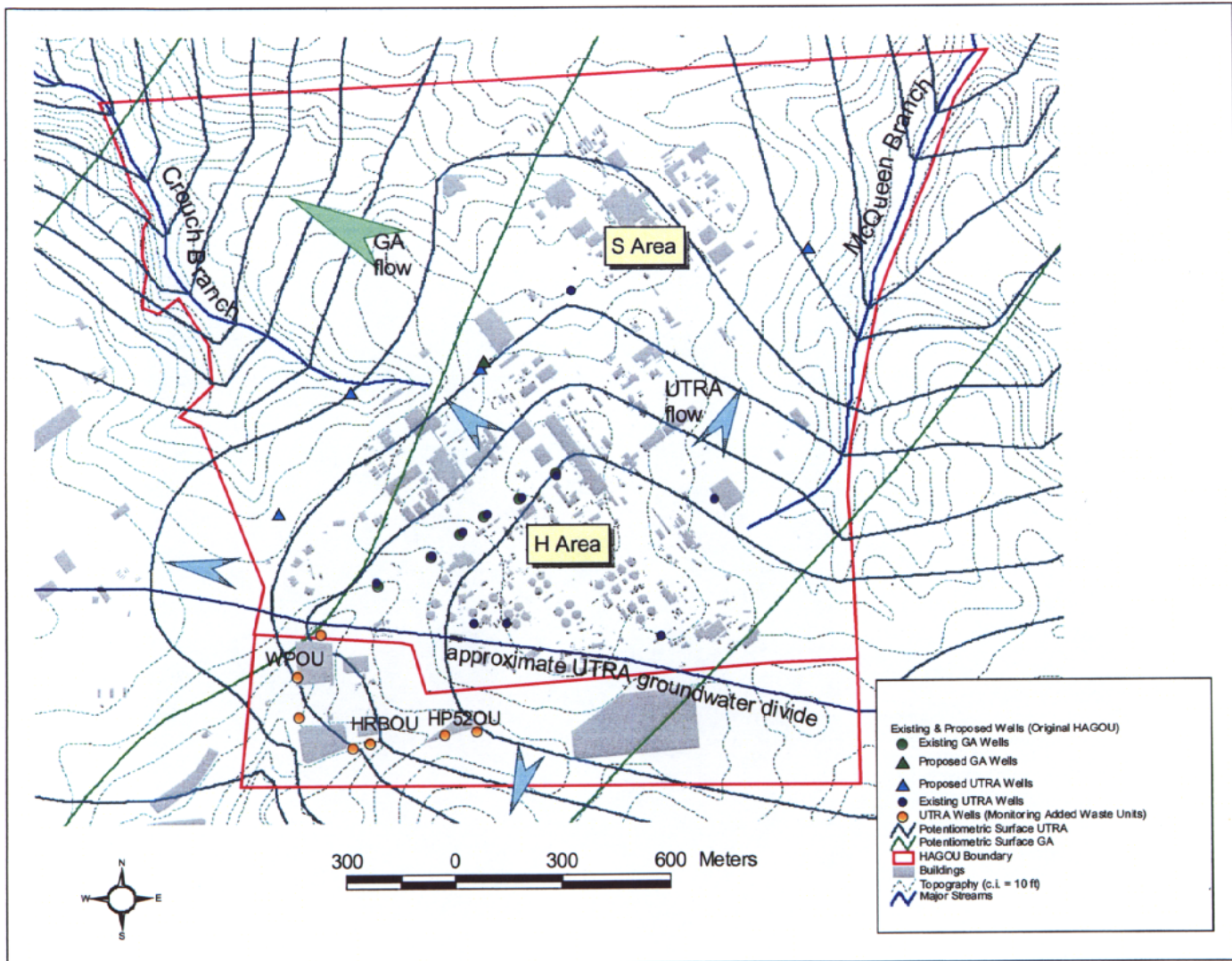


Figure 1: Details of the HAGOU Monitoring Network

## **5.0 Operable Unit Strategy and Schedule**

The strategy for the HAGOU is to:

- Establish an expanded groundwater operable unit that includes all potential contaminant sources.
- Create a robust groundwater monitoring network in both the UTRA and the Gordon Aquifer.
- Sample the network semi-annually for contaminants of concern, and monitor the groundwater quality to determine the nature and extent of contamination.
- Report validated groundwater analytical data to the Core Team.
- Convene the Core Team annually (or as necessary) to review data, re-evaluate the well network, sampling frequency, and analyte list, assess the effectiveness of the OU logic, and decide if the monitoring strategy is still appropriate or if changes are required (including the need for immediate action).
- Modify the work plan to incorporate groundwater from surrounding waste units that may affect the HAGOU, and revise the HAGOU boundary as needed.
- Notify the Core Team promptly if monitoring data indicate a problem that requires immediate action.

SRS is submitting a Rev.1.21 Work Plan that describes the HAGOU monitoring strategy agreed to by the Core Team, including the addition of groundwater from HRBOU, WPOU, and HP52OU. The Rev.1.2 Work Plan also addresses comments received from USEPA and SCDHEC.

SRS installed five new monitoring wells between in August and September 2001. These new wells, plus 17 existing wells of the HAA, HTF, HCB, and SBG series, will be sampled semi-annually for a focused set of constituents beginning within 90 days after Work Plan approval. To monitor groundwater at the three added waste units (HRBOU, WPOU, and HP52OU), SRS will begin sampling seven wells in the HSL, HR8, HR3 and HHP series. These seven wells will be sampled semi-annually for a limited set of constituents beginning approximately 18 months before the expected start of remedial actions for these units. Immediately after receiving validated data for the first two monitoring events, SRS proposes to convene the Core Team for an initial review of monitoring data.