007369

United States Department of Energy
Savannah River Site

Record of Decision
Remedial Alternative Selection for the West of Savannah River Ecology Laboratory (SREL) Georgia Fields Site (631-19G) Operable Unit (U)

WSRC-RP-99-4164
Revision 0
May 2000

Prepared by:
Westinghouse Savannah River Company LLC
Savannah River Site
Aiken, SC 29808

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SRS
SAVANNAH RIVER SITE

Prepared for U.S. Department of Energy under Contract No. DE-AC09-96SR18500

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Prepared for
U. S. Department of Energy
and
Westinghouse Savannah River Company LLC
Aiken, South Carolina

007369

RECORD OF DECISION
REMEDIAL ALTERNATIVE SELECTION (U)

WEST OF SAVANNAH RIVER ECOLOGY LABORATORY (SREL)
GEORGIA FIELDS SITE (631-19G) OPERABLE UNIT (U)

WSRC-RP-99-4164
Revision 0
May 2000

Savannah River Site
Aiken, South Carolina

Prepared By:

Westinghouse Savannah River Company LLC
for the
U. S. Department of Energy Under Contract DE-AC09-96SR18500
Savannah River Operations Office
Aiken, South Carolina

DECLARATION FOR THE RECORD OF DECISION

Unit Name and Location

West of Savannah River Ecology Laboratory (SREL) Georgia Fields Site (631-19G) Operable Unit (U)

Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Identification Number: OU-73

Savannah River Site

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Identification Number: SC1890008989

Aiken, South Carolina

United States Department of Energy

The West of Savannah River Ecology Laboratory (SREL) Georgia Fields Site (GFS) Operable Unit (OU) is listed as a Resource Conservation and Recovery Act (RCRA) 3004(u) Solid Waste Management Unit/Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) unit in Appendix C of the Federal Facility Agreement (FFA) for the Savannah River Site (SRS). The media associated with GFS are soil and groundwater. However, groundwater investigations, including collection of groundwater samples, were not conducted at GFS based on both the operational history of the unit and the field investigations for soil contamination.

Statement of Basis and Purpose

This decision document presents the selected remedial alternative for the GFS located at the SRS south of Aiken, South Carolina. The remedy was chosen in accordance with CERCLA, as amended by Superfund Amendments Reauthorization Act (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the Administrative Record File for this site.

The State of South Carolina concurs with the selected remedy.

Description of the Selected Remedy

The selected remedy for the GFS is a No Action alternative. Field investigations and soil sampling investigations for this OU were performed to determine if hazardous substances had been released to the environment. The analytical data identified no refined contaminants of concern (COCs).

The baseline risk assessment (BRA) also indicated that there were negligible risks to human health and the environment. Therefore, it appears that either there was no significant disposal of hazardous materials at the GFS or the natural remediation processes (i.e., bioremediation) have reduced the levels of hazardous materials to the extent that the GFS soils no longer pose a migration threat to groundwater.

No applicable or relevant and appropriate requirement (ARAR)-based COCs were determined. Additionally, no ecological or contaminant migration constituents of concern (CMCOCs) were identified at this unit. Therefore, a No Action alternative is the appropriate remedial action for the GFS.

The South Carolina Department of Health and Environment Control (SCDHEC) has modified the SRS RCRA permit to incorporate the No Action alternative.

Statutory Determinations

Based on the RCRA Facility Investigation/Remedial Investigation (RFI/RI) Work Plan with Risk Assessment for the West of SREL GFS report (WSRC 1999a), the GFS poses negligible risk to human health and the environment. Therefore, a No Action alternative is identified as the preferred remedial alternative for the GFS. The selected remedy is protective of human health and the environment and complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action.

Since there is no current or potential future threat to human health and the environment, no remedial action is necessary at the GFS.

Because this remedy will not result in hazardous substances remaining on site above levels that allow for unlimited use and unrestricted exposure, a five-year review will not be required for the No Action alternative.

5/31/00
Date

Thomas F. Heenan
Assistant Manager for Environmental Programs
US Department of Energy, Savannah River Operations Office

6/1/00
Date

Richard D. Green
Division Director
Waste Management Division
US Environmental Protection Agency - Region IV

11/17/00
Date

R. Lewis Shaw
Deputy Commissioner
Environmental Quality Control
South Carolina Department of Health and
Environmental Control

DECISION SUMMARY
REMEDIAL ALTERNATIVE SELECTION

WEST OF SAVANNAH RIVER ECOLOGY LABORATORY (SREL)
GEORGIA FIELDS SITE (631-19G) OPERABLE UNIT (U)

WSRC-RP-99-4164
Revision 0
May 2000

Savannah River Site
Aiken, South Carolina

Prepared By:

Westinghouse Savannah River Company LLC
for the
U. S. Department of Energy Under Contract DE-AC09-96SR18500
Savannah River Operations Office
Aiken, South Carolina

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

ARAR	applicable or relevant and appropriate requirement
bls	below land surface
BRA	Baseline Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act, 1980
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
cm	centimeter
CMCOC	contaminant migration constituent of concern
COC	constituent of concern
COPC	constituent of potential concern
CSM	conceptual site model
DCE	trans -1, 2-dichloroethene
FFA	Federal Facility Agreement
ft	feet
GFS	West of Savannah River Ecological Laboratory Georgia Fields Site Operable Unit
ha	hectare
HSWA	Hazardous and Solid Waste Amendments
in	inch
km	kilometer
m	meter
MCL	Maximum Contaminant Level
mg/kg	milligram/kilogram
mi	mile
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEPA	National Environmental Policy Act
NPL	National Priorities List
OU	operable unit
PCB	polychlorinated biphenyl

RBC	risk-based concentrations
RCRA	Resource Conservation and Recovery Act, 1976
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RME	reasonable maximum exposure
ROD	Record of Decision
SARA	Superfund Amendments Reauthorization Act
SB/PP	Statement of Basis/Proposed Plan
SCDHEC	South Carolina Department of Health and Environmental Control
SCHWMR	South Carolina Hazardous Waste Management Regulation
SREL	Savannah River Ecology Laboratory
SRS	Savannah River Site
SVOC	semi-volatile organic constituent
SWMU	solid waste management unit
USC	Unit specific constituent
US DOE	United States Department of Energy
US EPA	United States Environmental Protection Agency
VOC	volatile organic constituent
WSRC	Westinghouse Savannah River Company LLC

I. SAVANNAH RIVER SITE AND OPERABLE UNIT NAME, LOCATION, AND DESCRIPTION

Unit Name, Location, and Brief Description

West of Savannah River Ecology Laboratory (SREL) Georgia Fields Site (631-19G) Operable Unit (U)

Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Identification Number: OU-73

Savannah River Site

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Identification Number: SC1890008989

Aiken, South Carolina

United States Department of Energy

The Savannah River Site (SRS) occupies approximately 800 square kilometers (km) (310 square miles (mi)) of land adjacent to the Savannah River, principally in Aiken and Barnwell counties of western South Carolina (Figure 1). SRS is located approximately 40 km (25 mi) southeast of Augusta, Georgia, and 32 km (20 mi) south of Aiken, South Carolina.

The United States Department of Energy (US DOE) owns SRS, which historically produced tritium, plutonium, and other special nuclear materials for national defense and the space program. Chemical and radioactive wastes are byproducts of nuclear material production processes. Hazardous substances, as defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), are currently present in the environment at SRS.

The Federal Facility Agreement (FFA) (FFA 1993) for SRS lists the West of SREL Georgia Fields Site (GFS) (631-19G) Operable Unit (OU) as a Resource

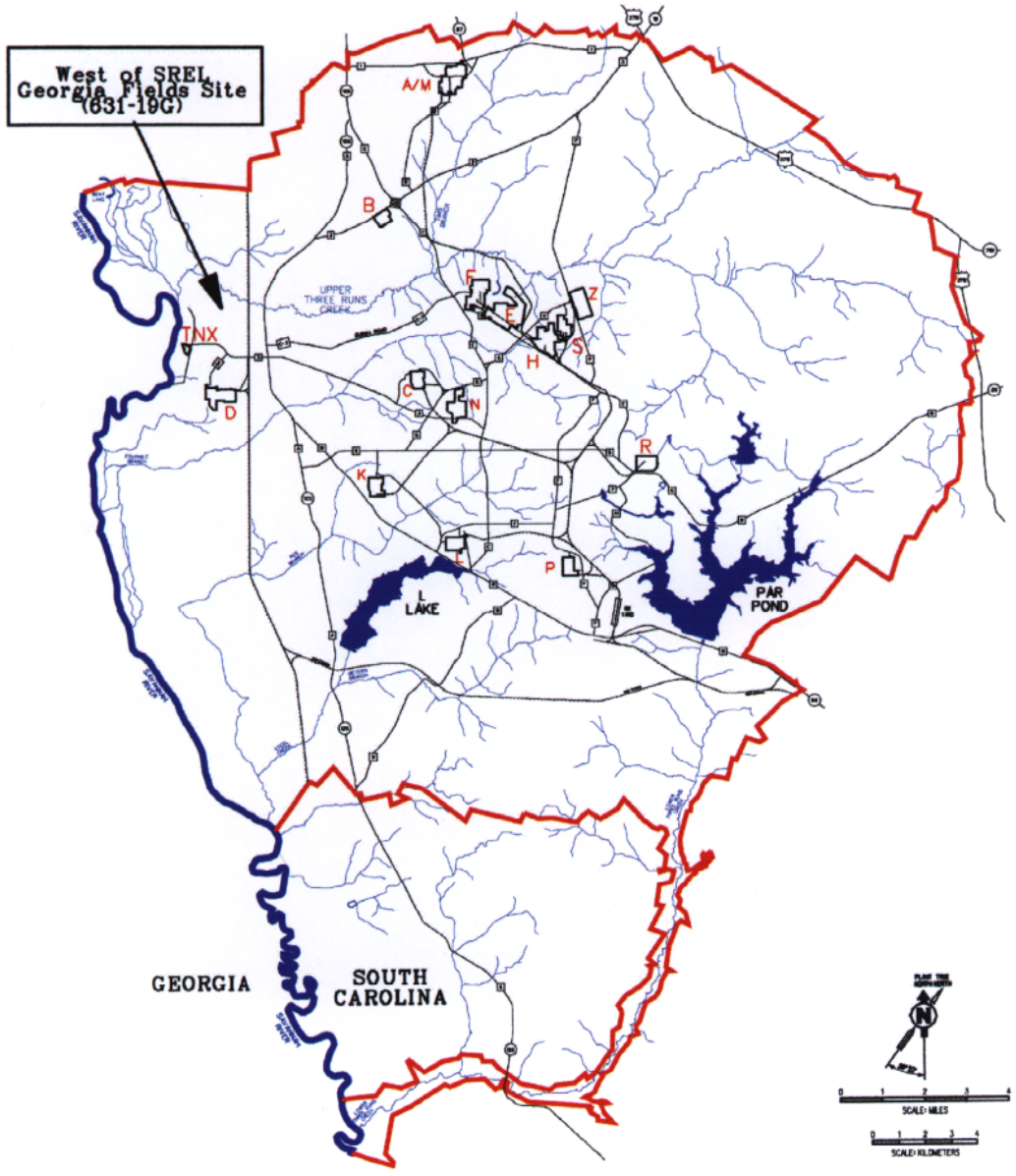

Figure 1. **Location of the West of SREL Georgia Fields Site (631-19G) at the Savannah River Site**

Conservation and Recovery Act (RCRA) Solid Waste Management Unit (SWMU)/CERCLA unit requiring further evaluation. The GFS required further evaluation through an investigation process that integrates and combines the RCRA Facility Investigation (RFI) process with the CERCLA remedial investigation (RI) process to determine the actual or potential impact to human health and the environment.

II. SITE AND OPERABLE UNIT COMPLIANCE HISTORY

SRS Operational and Compliance History

The primary mission of SRS has been to produce tritium, plutonium, and other special nuclear materials for our nation's defense programs. Production of nuclear materials for the defense programs was discontinued in 1988. SRS has provided nuclear materials for the space program as well as for medical, industrial, and research efforts up to the present. Chemical and radioactive wastes are byproducts of nuclear material production processes. These wastes have been treated, stored, and in some cases, disposed of at SRS. Past disposal practices have resulted in soil and groundwater contamination.

Hazardous waste materials handled at SRS are managed under RCRA, a comprehensive law requiring responsible management of hazardous waste. Certain SRS activities require South Carolina Department of Health and Environmental Control (SCDHEC) operating or post-closure permits under RCRA. SRS received a hazardous waste permit from the SCDHEC, which was most recently renewed on September 5, 1995. Module IV of the Hazardous and Solid Waste Amendments (HSWA) portion of the RCRA permit mandates corrective action for non-regulated SWMUs subject to RCRA 3004(u).

On December 21, 1989, SRS was included on the National Priorities List (NPL). The inclusion created a need to integrate the established RFI Program with CERCLA

requirements to provide for a focused environmental program. In accordance with Section 120 of CERCLA 42 USC Section 9620, US DOE has negotiated an FFA (FFA 1993) with the United States Environmental Protection Agency (US EPA) and SCDHEC to coordinate remedial activities at SRS into one comprehensive strategy which fulfills these dual regulatory requirements. US DOE functions as the lead agency for remedial activities at SRS, with concurrence by the US EPA – Region IV and SCDHEC.

Operable Unit Operational and Compliance History

The GFS, located approximately 1.6 km (1 mi) north (see Figure 1) of TNX Area (a research and development designated area supporting SRS operations), is approximately 0.25 ha (0.62 acre) in area. The GFS is located north of and adjacent to an area formerly used by the SREL for trapping, collecting, tagging, and tracking of animals. A sheet metal drift fence, approximately 76 cm (30 in) high used by SREL to direct small animals to collection points, parallels the southern boundary of the site. Presently, orange ball markers denote the boundary of the GFS (Figure 2).

The site appears to have been used as a surface disposal area for abandoned debris. Less than 50 percent of the unit area contains debris. The debris located on the site includes one empty 55-gallon steel drum, one empty 20-gallon steel drum, six empty 5-gallon buckets, piles of burlap, wood waste, wire coils, rolls of wire, ladders, chain link fence parts, and miscellaneous kitchen pots and pans. There is no evidence of past intrusive activities at the site. In addition, the only known construction on the site is a drift fence for which some of the support posts remain in place. A potential former farmhouse (pre-SRS), located just north of the GFS, is characterized by numerous piles of household waste (cans, bottles, etc.).

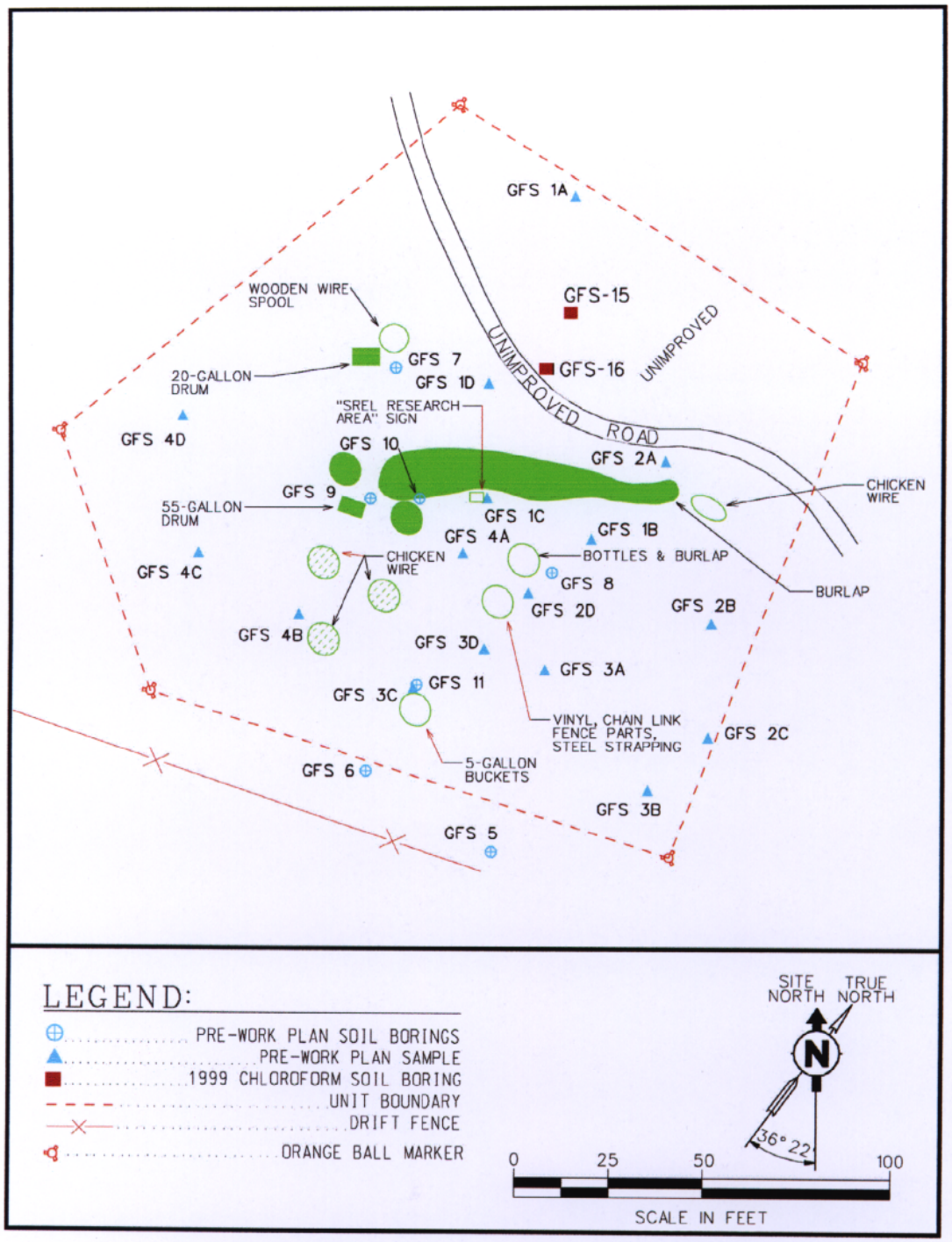

Figure 2. **Boundary of the West of SREL Georgia Fields Site (631-19G) and Location of Surface Samples, Soil Borings and Debris**

The site is heavily wooded except for an unimproved dirt access road that crosses the northern quarter of the site. The access road runs east-west and then curves to the northwest. Where the road curves, what appears to be an abandoned road splits off from the active road and continues to the west. Most of the debris at the site is present on either side of the abandoned road. Saplings up to 3 cm (1.5 in) in diameter now occupy the track of the abandoned road, suggesting that it has not been used for some time. There is no documentation or record of any hazardous substance management or disposal at the unit. Neither chemicals nor preservatives are reported to have been used in activities performed at the adjacent trapping area.

The vegetation is dominated by second growth, mixed hardwoods, including sweet gum, live oak, scrub oaks, American elm, and hickories. A few pine trees are also present at the GFS, forming a dense canopy over a relatively open understory. The underbrush includes Carolina creeper and poison ivy. The ground cover consists of fallen deciduous tree leaves and pine needles.

The ground surface is generally flat, sloping gently (2 to 3 percent slope) to the north-northwest. North of the unit, the grade increases to 8 to 10 percent and then flattens out into the Floodplain of Upper Three Runs Creek. There are no distinct surface depressions or surface water drainage features.

A manmade gully, approximately 6 m (20 ft) across and 1.8 m (6 ft) deep, is located 50 m (160 ft) north of the unit. The gully feeds into the Upper Three Runs Creek Floodplain, which is approximately 300 m (1400 ft) north of the unit. However, it carries surface water very infrequently.

The GFS does not contain wetlands or water wells that can be used as a drinking water source.

No threatened or endangered and sensitive species exist in the vicinity of the GFS.

No removal action of any kind has taken place at the site.

III. HIGHLIGHTS OF COMMUNITY PARTICIPATION

Both RCRA and CERCLA require that the public be given an opportunity to review and comment on the draft permit modification and proposed remedial alternative. Public participation requirements are listed in South Carolina Hazardous Waste Management Regulation (SCHWMR) R.61-79.124 and Sections 113 and 117 of CERCLA 42 USC Sections 9613 and 9617. These requirements include establishment of an Administrative Record File that documents the investigation and selection of the remedial alternatives for addressing the GFS soil and groundwater. The Administrative Record File must be established at or near the facility at issue.

The SRS Public Involvement Plan (US DOE 1994) is designed to facilitate public involvement in the decision-making process for permitting, closure, and the selection of remedial alternatives. The SRS Public Involvement Plan addresses requirements of RCRA, CERCLA, and the National Environmental Policy Act (NEPA), 1969. SCHWMR R.61-79.124 and Section 117(a) of CERCLA, as amended, require the advertisement of the draft permit modification and notice of any proposed remedial action and provide the public an opportunity to participate in the selection of the remedial action. The Statement of Basis/Proposed Plan (SB/PP) for the West of SREL GFS (WSRC 1999b), a part of the Administrative Record File, highlights key aspects of the investigation and identifies the preferred action for addressing the GFS.

The FFA Administrative Record File, which contains the information pertaining to the selection of the response action, is available at the following locations:

U.S. Department of Energy
Public Reading Room
Gregg-Graniteville Library
University of South Carolina-Aiken
171 University Parkway
Aiken, South Carolina 29801
(803) 641-3465

Thomas Cooper Library
Government Documents Department
University of South Carolina
Columbia, South Carolina 29208
(803) 777-4866

The RCRA Administrative Record File for SCDHEC is available for review by the public at the following locations:

The South Carolina Department of Health and Environmental Control
Bureau of Land and Waste Management
8901 Farrow Road
Columbia, South Carolina 29203
(803) 896-4000

Lower Savannah District Environmental Quality Control Office
218 Beaufort Street, Northeast
Aiken, South Carolina 29802
(803) 641-7670

The public was notified of the public comment period through mailings of the *SRS Environmental Bulletin*, a newsletter sent to citizens in South Carolina and Georgia, and through notices in the *Aiken Standard*, the *Allendale Citizen Leader*, the *Augusta Chronicle*, the *Barnwell People-Sentinel*, and *The State* newspapers. The public comment period was also announced on local radio stations.

The 45-day public comment period for the SB/PP and the draft RCRA permit began on March 30, 2000 and ended on May 13, 2000. A Responsiveness Summary was prepared to address any comments received during the public comment period. The Responsiveness Summary is provided in Appendix A of this Record of Decision (ROD). It will also be available in the final RCRA permit.

IV. SCOPE AND ROLE OF THE OPERABLE UNIT WITHIN THE SITE STRATEGY

RCRA/CERCLA Program at SRS

RCRA/CERCLA units (including the GFS) at SRS are subject to a multi-stage RI process that integrates the requirements of RCRA and CERCLA as outlined in the FFA. The RCRA/CERCLA processes are summarized below:

- investigation and characterization of potentially impacted environmental media (such as soil, groundwater, and surface water) comprising the waste site and surrounding areas
- the evaluation of risk to human health and the local ecological community
- the screening of possible remedial actions to identify the selected technology which will protect human health and the environment
- implementation of the selected alternative
- documentation that the remediation has been performed competently
- evaluation of the effectiveness of the technology

The steps of this process are iterative in nature and include decision points which require concurrence between US DOE as owner/manager, US EPA and SCDHEC as regulatory oversight agencies, and the public (see Figure 3).

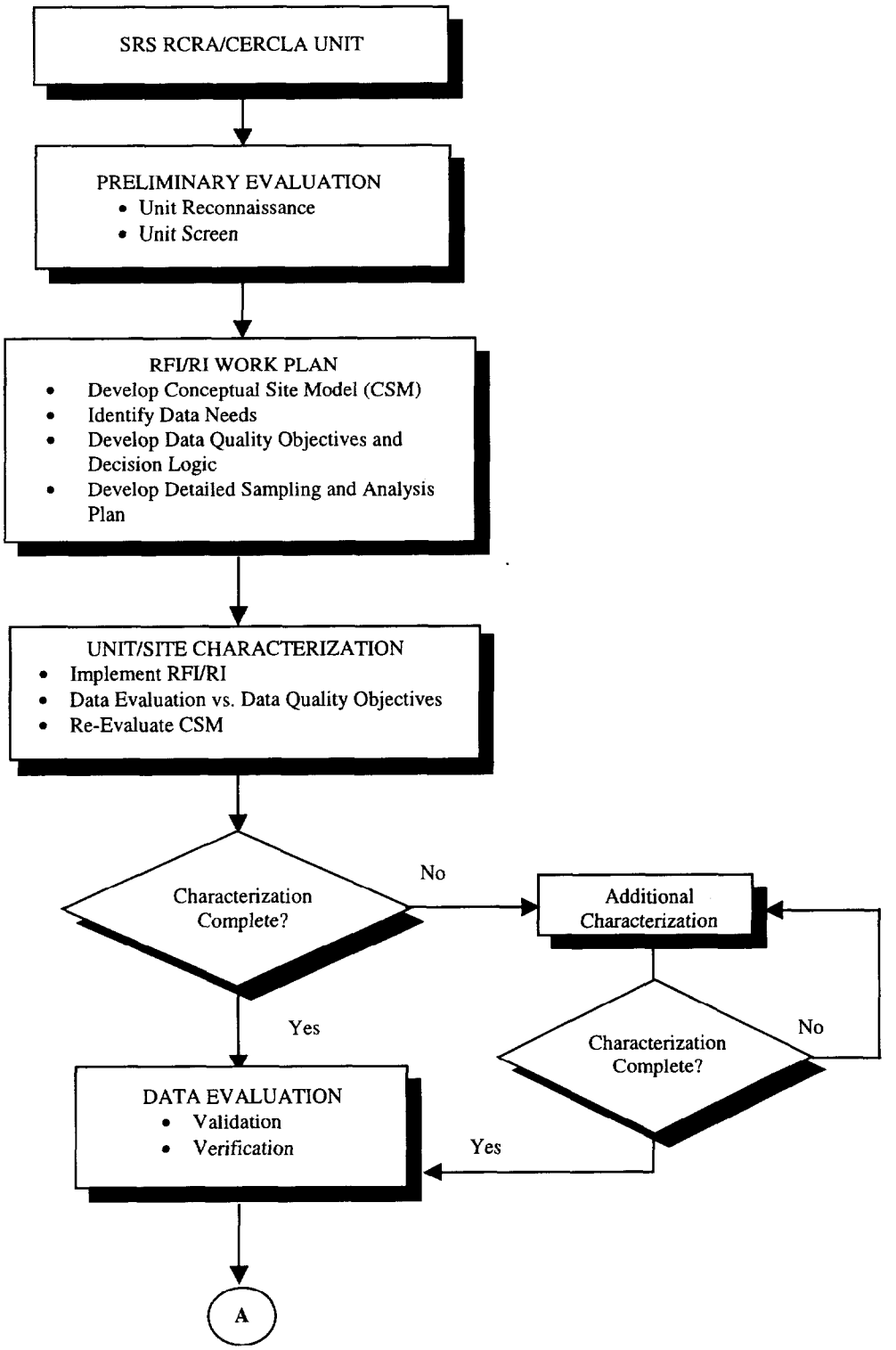

Figure 3. RCRA/CERCLA Logic and Documentation

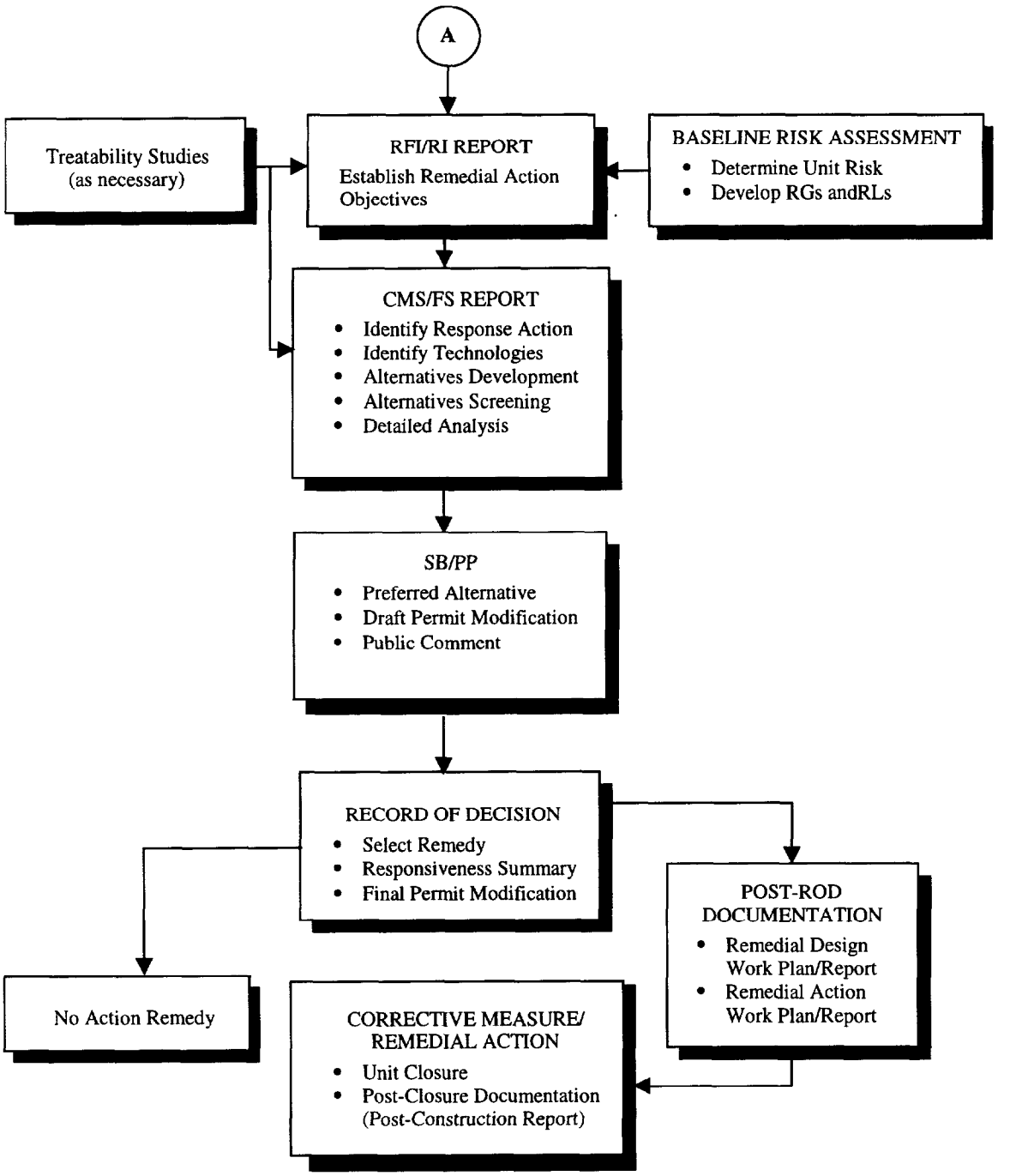

Figure 3. RCRA/CERCLA Logic and Documentation (Cont'd.)

Operable Unit Remedial Strategy

The overall strategy for addressing the GFS was to (1) characterize the waste unit, delineating the nature and extent of contamination and identifying the media of concern (perform the RFI/RI); (2) perform a Baseline Risk Assessment (BRA) to evaluate media of concern, constituents of concern (COCs), exposure pathways, and characterize potential risks; and (3) evaluate and perform a final action to remediate, as needed, the identified media of concern.

The GFS is an OU located within the Upper Three Runs Creek Watershed that is not a "source control" unit (i.e., the unit does not contain contaminated soil that may act as a source of future contamination to the groundwater through leaching). In addition to the GFS unit, there are many OUs within the watershed. All the source control and groundwater OUs located within the watershed will be evaluated to determine their impacts, if any, to the associated streams and wetlands.

SRS will manage all source control units to prevent impact to the watershed. Upon disposition of all source control and groundwater OUs within the watershed, a final comprehensive ROD for the Upper Three Runs Watershed will be pursued.

The previous field investigations and soil sampling conducted in 1997 and 1999, during the development of the RFI/RI Work Plan with Risk Assessment for the West of SREL GFS (WSRC 1999a), have indicated that the groundwater has not been impacted by the GFS. The results of the contaminant fate and transport analysis also did not reveal any potential for impact to the groundwater. The groundwater does not outcrop in the vicinity of the GFS.

The risk assessments have also revealed that there is negligible potential risk to human health and the environment associated with the GFS. There is no principal threat source material present at the unit and, therefore, the GFS requires no cleanup

activities. Hence, a No Action alternative is recommended for the unit. This means no further action will be taken and the GFS will remain in its present condition. Therefore, the GFS will have no impact on the response actions of other OUs at SRS.

V. OPERABLE UNIT CHARACTERISTICS

Conceptual Site Model for the GFS

The unit reconnaissance (field observations and preliminary characterization) was conducted on July 21, 1998. The reconnaissance revealed that no hazardous substances had been deposited at the GFS. Neither chemicals nor preservatives are reported to have been used in activities performed at the adjacent trapping area. The only material found in the GFS includes debris comprising of empty drums and buckets. There are no free liquids or mobile or highly toxic material associated with the debris. Hence, the debris of unknown origin applied to ground surface was the only potential primary source of contamination identified. The approximate distribution of debris observed at the GFS is shown in Figure 2.

Since the field investigations revealed debris as the only potential primary source of contamination, the conceptual site model (CSM) was developed only for the debris associated with the GFS. The CSM is shown in Figure 4 and identifies the primary release mechanisms, media of concern, and potential receptors. The CSM also identifies the secondary contamination sources, secondary release mechanisms, exposure media, exposure units, and potential human and ecological receptors.

Primary Source and Release Mechanisms

The original contents of the empty drums and buckets found at the GFS cannot be identified, so they are considered potential sources of hazardous material. Since the drums and buckets are empty, there is no known primary source material present at the GFS.

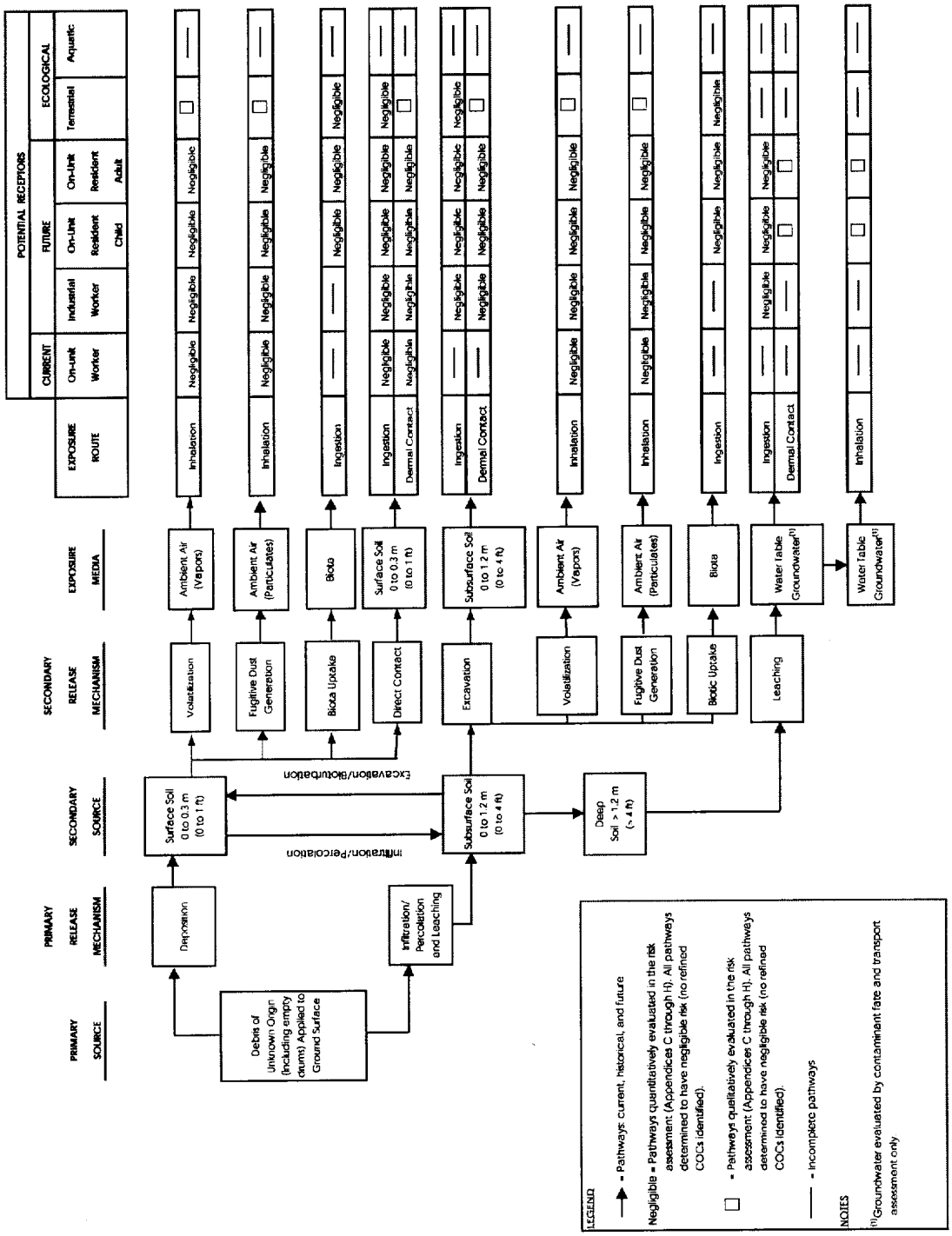

Figure 4. Conceptual Site Model for the West of SREL Georgia Fields Site (631-19G)

The primary release mechanisms considered for the debris were deposits of hazardous materials on the ground surface or release of drum or bucket contents due to container failure and infiltration/percolation of water contaminated by contact with waste. However, since there is no primary source material present at the unit, these release mechanisms are no longer a potential source of contamination.

Secondary Source and Release Mechanisms

The environmental media impacted by the potential release of primary source contamination are considered as secondary sources. Since soils are the only potential media impacted by the debris present at the GFS, the secondary contamination sources include surface soil (0 to 0.3 m [0 to 1 ft] below land surface (bls)), subsurface soil (0 to 1.2 m [0 to 4 ft] bls), and deep soil (>1.2 m [>4 ft] bls). The secondary release mechanisms included volatilization, fugitive dust generation, and biotic uptake for the surface soil and leaching to groundwater as a secondary release mechanism for the subsurface and deep soils.

Exposure Pathways, Exposure Routes, and Receptors

Contact with contaminated media creates the exposure pathways for human as well as ecological receptors. The most common exposure pathways included air (vapor and particulates) and biota in the vicinity of the GFS and leaching of subsurface contamination to groundwater by infiltration.

Exposure routes evaluated for human and ecological receptors included inhalation of volatile emission and airborne dust; ingestion of contaminated media, including soil, groundwater, vegetation and produce grown by hypothetical on-unit residents; and dermal contact with contaminated media.

Human receptors included known on-unit workers occasionally in the area, hypothetical future industrial workers and hypothetical future on-unit residents. Ecological receptors were selected based on US EPA guidelines (US EPA 1997).

The results of the CSM have revealed that all exposure pathways and exposure routes pose negligible risk to human and ecological receptors.

Media Assessment

The RFI/RI Work Plan with Risk Assessment for the West of SREL GFS (WSRC 1999a) contains the detailed information and analytical data for all the investigations conducted and samples taken in the media assessment of the GFS. This document is available in the Administrative Record File (see Section III of this document).

Soil Investigations

Existing characterization data pertaining to the GFS were collected during soil-gas investigations conducted in 1988 and 1991, radiation surveys conducted in 1990, and soil sampling investigations conducted in 1997 and 1999. In the 1988 survey, 10 soil-gas samples were collected from a depth of 46 to 61 cm (18 to 24 in) and analyzed for chlorinated organic solvents. In the 1991 investigations, a total of 57 soil-gas samples (including 5 duplicate samples) were collected on a random grid of 6.1 m (20 ft) intervals. Samples were analyzed for 27 organic compounds.

The 1997 soil investigations consisted of the following: (1) discrete soil samples collected from seven (7) borings installed within (next to the existing debris) and adjacent to the GFS boundaries and (2) four (4) composite surface soil samples taken from within the GFS boundaries at random locations. Additionally, three (3) unit-specific background soil borings were advanced in areas not impacted by historical activities associated with GFS. The soil samples were collected in surface soil (0 to 0.3 m [0 to 1 ft] bls), subsurface soil (0.3 to 1.2 m [1 to 4 ft] bls), and deep soil

(>1.2 m [4 ft] bls). The soil samples were analyzed for a comprehensive suite of constituents including inorganics, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), and pesticides/polychlorinated biphenyls (PCBs).

The soil sampling investigation of 1999 was conducted to verify soil-gas chloroform results from an early soil-gas survey investigation in 1991. The 1999 investigation consisted of two (2) soil borings sampled for chloroform only. The sampling locations were selected to coincide with the most contaminated soils as determined by the 1991 soil-gas investigation. The soil samples were collected from borings 0.8 m (2.5 ft), 1.7 m (5.5 ft), 2.6 m (8.5 ft), 3.5 m (11.5 ft), and 4.4 m (14.5 ft) bls.

Groundwater Investigation

No formal groundwater sampling has been conducted at the unit and none is planned. The rationale for this approach to groundwater at GFS is presented in the following section.

Assessment Investigation Results

Soils

The analytical results of the 1988 investigation revealed only low concentrations of chloroform and trans-1,2-dichloroethene (DCE), indicative of natural microbial degradation of chloroform rather than a chemical release of DCE at the site. The results of the 1991 investigation also confirmed the presence of low concentrations of chloroform. The other chlorinated hydrocarbon, DCE, was not detected, thereby confirming microbial degradation rather than any chemical release at the site. The 1999 chloroform soil sampling investigation also validated low (less than 0.005 mg/kg) concentration levels of chloroform.

The radiation survey conducted in September 1990 did not detect any radioactive contamination at the GFS.

To determine the COCs associated with the GFS, all the results of the soil analyses conducted in 1997 were compiled using standard SRS risk assessment protocols for the surface, subsurface, and deep soil exposure groups. Contaminant migration COCs (CMCOCs) were identified through contaminant fate and transport analyses using the CSM to assess the potential for adverse effects to humans and the environment. The CSM is depicted in Figure 4.

Table 1 provides an overview of the process employed in determining the refined COCs to be retained for further remedial evaluation. The process involved the following steps. First, from the detected constituents, unit-specific constituents (USCs) were identified. USCs were determined by comparing each detected constituent concentration found in the soil against its respective twice average background concentration for all depth intervals (0 to 4 m [0 to 13 ft]). Secondly, the USCs were further screened to reflect risk to human health or the environment and thereby determine preliminary COCs. The preliminary COCs, in addition to risk-based COCs, included applicable or relevant and appropriate requirements (ARAR)-based COCs and CMCOCs. Risk-based COCs were identified per CERCLA guidance.

Finally, the preliminary COCs were carried into a formal uncertainty analyses and refined COCs were determined. The results of the assessment investigations are summarized below:

TABLE 1. OVERVIEW OF THE COC SCREENING PROCESS – WEST OF SREL GEORGIA FIELDS SITE (631-19G)

	Extent & Nature		Fate & Transport		Human Health		Ecological		Summary
Directed Constituent in Soil	**USC**	**ARAR COC**	**CM COPC**	**CM COC**	**COPC**	**COC**	**COPC**	**COC**	**Refined COC**
		None	**None**	**None**				**None**	**None**
TAL Inorganics									
Aluminum	X						X		
Antimony	X				X	X	X		
Arsenic	X				X	X			
Barium	X								
Beryllium	X								
Cadmium	X						X		
Calcium	X						X		
Chromium	X						X		
Cobalt	X								
Copper	X				X		X		
Iron	X				X		X		
Lead	X								
Magnesium							X		
Manganese	X				X		X		
Mercury	X						X		
Nickel	X								
Potassium	X						X		
Sodium							X		
Vanadium	X						X		
Zinc	X						X		
TCL Semivolatiles									
Benzoic Acid	X						X		
Bis (2-ethylhexyl) pthalate	X						X		
TCL Volatiles									
Chloroform	X								
Toluene	X								
Xylenes (Total)	X								
Pesticides/PCBs									
p,p'-DDT	X						X		

USC Unit Specific Constituents
COC Constituent of Concern
ARAR COC Applicable or Relevant and Appropriate Requirement COC
CMCOPC Contaminant Migration Constituent of Potential Concern
COPC Constituent of Potential Concern
TAL Target Analyte List
TCL Target Compound List
PCBs Polychlorinated biphenyls

- There have been no known releases of hazardous constituents at the GFS. Presently, there is debris on the land surface at the unit; however, no free liquids or mobile or highly toxic materials are associated with the debris.

- Twenty-four USCs associated with the GFS were identified. These included eighteen metals, two SVOCs, three VOCs and one pesticide/PCB. Additionally, two metals were identified as ecological constituents of potential concern (COPCs).

- The eighteen metal USCs included aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, potassium, vanadium, and zinc. SVOCs included benzoic acid and bis (2-ethylhexyl) phthalate. VOCs included chloroform, toluene, and total xylenes. The single pesticide/PCB USC was dichlorodiphenyltrichloroethene (p, p'-DDT). Ecological COPCs included 12 of 18 metal USCs and magnesium and sodium (see Table 1).

- The nature and extent analysis indicates that nearly all COCs are at natural soil concentrations and their distributions are typical of SRS soils unimpacted by SRS activities at the GFS. An exception is antimony. The highest detected antimony concentration (49.4 mg/kg) exceeds background concentrations. However, this detection is associated with a biased sample location adjacent to burlap debris, buckets, and cans (see Figure 2). All of the remaining nine antimony detections (antimony was detected in 10 of 23 samples) fall within the range of SRS background soils.

- Antimony is identified as a human health COC for surface soil under reasonable maximum exposure (RME) conditions. Under central tendency conditions, antimony is not a COC (hazard quotient of 0.55, which is less than one). The unit-specific RME concentration is 22 mg/kg, which is less than the

SRS maximum background. Based on uncertainty considerations, antimony is not recommended for further remedial consideration as a refined human health COC.

- No soil constituents exceed any ARARs.

- No refined CMCOCs are identified; therefore, constituents in the unit soils do not pose a migration threat to groundwater. The refined CMCOCs are those constituents that are retained to be further evaluated for remedial action.

- Arsenic is identified as a human health COC in surface and subsurface soil. The unit-related concentrations are very similar to unit-specific background concentrations. The observed arsenic concentrations are also well within the ranges seen in background from across the SRS. Arsenic is not recommended for further remedial consideration as a refined human health COC.

- No ecological COCs are identified.

In summary, the results of the GFS waste characterization analyses show that no refined COCs are associated with the GFS.

Groundwater

Groundwater investigations, including collection of groundwater samples, were not conducted at GFS. This approach to groundwater was based on both the operational history of the unit and the field investigations for soil contamination. No hazardous substances are known to have been disposed of at the GFS, and no chemicals or preservatives are reported to have been used in activities performed at the adjacent SREL trapping area. This knowledge is supported by the results of field investigations and soil sampling conducted in 1997 and 1999, which showed no sign of hazardous waste disposal at this unit. In addition, contaminant fate and transport analysis did not predict future migration of GFS soil constituents to the groundwater.

Therefore, there is no indication that groundwater impacts from past activities at the GFS have ever occurred or are likely to occur in the future.

Site-Specific Factors

Since no hazardous substances are known to have been disposed of at the GFS and no chemicals or preservatives are reported to have been used in activities performed at the adjacent trapping area, no removal action of any kind has taken place at the unit.

There are no site-specific factors that may affect the No Action alternative as the recommended response action.

Contaminant Transport Analysis

Figure 5 presents the conceptual model for the contaminant migration analysis performed for the GFS. The analysis of contaminant fate and transport was based on the data collected from soil sampling investigations conducted in 1997 and 1999. The analysis was performed (1) to determine each USC's potential for leaching to groundwater, (2) to predict the migration data for each USC, and (3) to project concentrations delivered to the receptor location via vadose zone pore water and groundwater. The results of the analysis revealed that concentrations of constituents detected in the GFS soils will not exceed their Maximum Contaminant Levels (MCLs) within the 1,000-year modeling period. MCL is the maximum concentration of a substance allowed in water that is delivered to any user of a public water supply as required by the Safe Drinking Water Act. The contaminant migration analysis identified no refined CMCOCs. Therefore, the GFS soils do not pose a migration threat to groundwater.

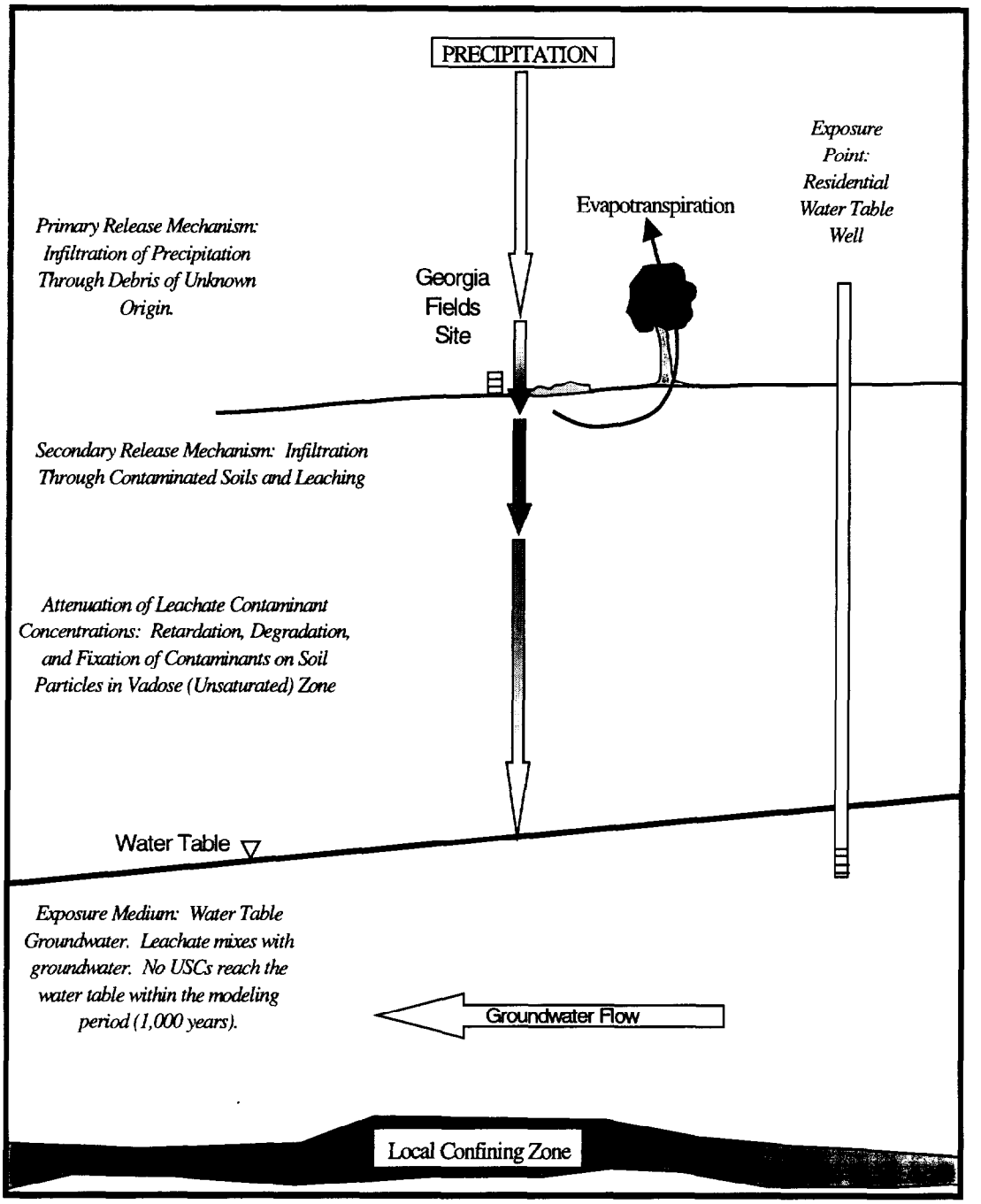

Figure 5. Conceptual Model for the Contaminant Migration Analysis

VI. CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

Land Uses

Current Land Use

Currently, the GFS is not in use. Access to the SRS is controlled by the US DOE. Once within the SRS boundaries, access to the GFS is not restricted. The GFS is not fenced; however, the boundary is marked with orange balls. The GFS and the area surrounding it are primarily undeveloped and heavily wooded. Only unpaved roadways run nearby and, therefore, casual trespassing by SRS employees is unlikely. The only potential occasional visits to the GFS could be by the on-unit workers. The on-unit workers are defined as SRS employees who work at or in the vicinity of the GFS under current land use conditions and include, but are not limited to, researchers, environmental samplers, or personnel in close proximity to the unit (e.g., a researcher associated with SRS who uses the unit as an outdoor laboratory). However, these receptors, who may be involved in the excavation or collection of contaminated media, would be following the SRS procedures and protocols for sampling at hazardous waste units.

Future Land Use

The report *Savannah River Site: Future Use Project Report* (US DOE 1996) presents stakeholder-preferred future land use recommendations for the SRS. This report recommends that the GFS be designated for future residential use. However, per SRS risk assessment protocols (WSRC 1998), the future industrial use scenario is also evaluated for each waste unit. Therefore, the potentially exposed receptors evaluated for the GFS future land use scenarios include the hypothetical on-unit industrial workers (adult) and the hypothetical on-unit residents (adult and child). The exposure routes considered for evaluation include:

- Ingestion (soil)
- Inhalation (of vapors and particles)
- Dermal exposure (from soil)

Groundwater Uses/Surface Water Uses

Currently, groundwater beneath the GFS is not being used for any type of human consumption. The groundwater that flows beneath the GFS discharges into the Upper Three Runs Creek.

There are no distinct surface water features on the unit, nor are there any drainage or surface runoff features which indicate that the surface runoff is being used for irrigation or any other beneficial uses.

VII. SUMMARY OF OPERABLE UNIT RISKS

As a component of the RFI/RI process, a BRA was performed for the GFS. The BRA included human health risk and ecological risk assessments. The results of the risk assessments are summarized in the following paragraphs.

Summary of the Human Health Risk Assessment

A review of the analytical data contained in the RFI/RI Work Plan with Risk Assessment for the West of SREL GFS (WSRC 1999a) indicates that the data are of sufficient quality for use in the risk assessment evaluation.

Based on the existing analytical data, an evaluation was conducted to estimate the human health and environmental problems that could result from the current physical and waste characteristics of the GFS. The results of the assessment indicated that the concentrations of all the constituents analyzed, except for arsenic and antimony, were

below US EPA risk-based concentrations (RBCs) and the calculated carcinogenic risks were below the US EPA target risk range of 1.0×10^{-4} to 1.0×10^{-6}. The concentrations of arsenic and antimony were above RBCs and, therefore, both antimony and arsenic were identified as COCs for the residential receptors. However, these were not carried forward as refined COCs because the unit concentrations were within the range of concentrations expected in SRS background soil conditions. Hence, there are no refined human health COCs, and negligible health risks are posed by the GFS soils and groundwater to current or future workers and future residents at the unit that warrant remedial action.

Summary of the Ecological Risk Assessment

The purpose of the ecological risk assessment component of the BRA is to evaluate the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to unit-related constituents based on a line-of-evidence approach. Based on the analytical data pertaining to the GFS, there is no compelling evidence that hazardous materials were managed or disposed of at this unit. Therefore, it is reasonable to conclude that this unit presents no significant ecological risk. The ecological risk assessment has concluded that no refined COCs are associated with the GFS, and therefore the unit poses negligible risk to the ecological receptors.

Risk Assessment Summary

The risk assessments and contaminant fate and transport analysis (discussed in Section V) establish that the risk associated with the GFS is negligible; and the field investigations do not establish any known release of hazardous constituents at the GFS. It can reasonably be concluded that no principal threat source material exists at the unit. There is only debris on the land surface at the unit and no mobile or highly toxic materials are associated with the debris. Therefore, no remedial action is necessary at the GFS to ensure protection of human health and the environment.

VIII. EXPLANATION OF SIGNIFICANT CHANGES

There were no significant changes made to the ROD based on the comments received during the public comment period for the SB/PP. Comments that were received during the public comment period are addressed in the Responsiveness Summary included in Appendix A of this document.

IX. RESPONSIVENESS SUMMARY

The Responsiveness Summary is provided in Appendix A of this document.

X. POST-ROD DOCUMENTS SCHEDULE AND DESCRIPTION

No remedial action will be performed at the GFS; therefore, a schedule for post-ROD cleanup activities is not provided.

XI. REFERENCES

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US DOE 1994. *Public Involvement, A Plan for the Savannah River Site,* Savannah River Operations Office, Aiken, SC

US DOE 1996. *Savannah River Site: Future Use Project Report,* Stakeholder Recommendations for SRS Land and Facilities, January 1996. Cover letter: Fiori, Mario P., "SRS Future Use Project Report (Reference: Transmittal of Final Draft 'Forging the Missing Link: A Resource Document for Identifying Future Use Options', Grumbly/Pearlman letter, 1/12/94)", United States Department of Energy Letter EB-96-015, Savannah River Site, Aiken, SC

US EPA 1997. *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting an Ecological Risk Assessment,* Interim Final, Environmental Response Team.

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WSRC 1999a. *RCRA Investigation/Remedial Investigation Work Plan with Risk Assessment for the West of SREL Georgia Fields Site (631-19G),* WSRC-RP-98-4054, Revision 1.1, Westinghouse Savannah River Company, Aiken, SC

WSRC 1999b. *Statement of Basis/Proposed Plan for the West of SREL Georgia Fields Site (631-19G) Operable Unit,* WSRC-PP-99-4163, Revision 1, Westinghouse Savannah River Company, Aiken, SC

APPENDIX A
RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

The 45-day public comment period for the *Statement of Basis/Proposed Plan for the West of Savannah River Ecology Laboratory (SREL) Georgia Fields Site (631-19G) Operable Unit* began on March 30, 2000 and ended on May 13, 2000.

Public Comments

There were no comments received from the public.