

Chapter 7: Groundwater Management Program

The purpose of the Savannah River Site (SRS) groundwater management program is to protect, monitor, remediate, and use groundwater. With this focus, the program accomplishes the following:

- Ensures future groundwater contamination does not occur
- Monitors groundwater to identify areas of contamination
- Remediates groundwater contamination as needed
- Conserves groundwater

2024 Highlights

Drinking Water Standards—In 2024 there were no exceedances of drinking water standards (measured by maximum contaminant levels [MCLs] or regional screening levels [RSLs]) in SRS boundary wells near A/M Area. These wells are the closest to the Site boundary and would indicate whether contamination was getting offsite.

Groundwater Contaminant Removal—In 2024, SRS removed 11,872 pounds (lbs) of volatile organic compounds (VOCs) from groundwater and the vadose zone. The Site also prevented 15.5 curies (Ci) of tritium from reaching SRS streams.

Offsite Groundwater Monitoring (Georgia)—Since 2001, tritium has been detected at low concentrations (less than 1 picocurie/milliliter [pCi/mL]) in only a few offsite wells, which is well below the MCL for tritium (20 pCi/mL). Most of the groundwater sampling has resulted in no detections of tritium. This data supports the conclusions of a U.S. Geological Survey (USGS) that indicate there is no mechanism by which groundwater could flow under the Savannah River and contaminate Georgia wells (Cherry 2006).

7.1 INTRODUCTION

Previous missions and operations at the Savannah River Site (SRS) have released chemicals and radionuclides into the soil and thus contaminated the groundwater around hazardous waste management facilities and waste disposal sites. Because of these past releases, SRS operates extensive groundwater monitoring and groundwater remediation programs. The vast majority of groundwater at the SRS is clean and not contaminated.

The SRS groundwater monitoring program requires regular well sampling to monitor for groundwater contaminants. Well monitoring meets the sampling requirements in agreements established through the [Federal Facility Agreement for the Savannah River Site](#) (Federal Facility Agreement [FFA] 1993) and in the Resource Conservation and Recovery Act (RCRA) permit for SRS. Well monitoring ensures the Site is providing

quality data to compare to South Carolina Department of Environmental Services (SCDES) and U.S. Environmental Protection Agency (EPA) drinking water quality standards. SRS uses SCDES-certified laboratories accredited by the U.S. Department of Energy (DOE) and SCDES to analyze groundwater samples using EPA methods or equivalents.

The monitoring data show that most of the contaminated groundwater plumes are in the central area of SRS, and none extends beyond the SRS boundary. Groundwater contamination at SRS is limited primarily to the Upper Three Runs/Steed Pond Aquifers and the Gordon/Lost Lake Aquifers (Figure 7-1). SRS submits summaries of groundwater data to regulatory agencies and, if necessary, remediates or removes the contamination. Appendix E: *Groundwater Management Program Supplemental Information* lists the documents reporting groundwater monitoring data that SRS submits to the regulatory agencies.

SRS uses several technologies to remediate groundwater that exceeds the maximum contaminant levels (MCLs) or regional screening levels (RSLs). Remediation includes closing and remediating waste units to reduce the potential for contaminants to reach groundwater, actively treating contaminated water, and employing passive and natural remedies.

Groundwater remediation at SRS focuses on volatile organic compounds (VOCs), low groundwater pH, metals, and tritium. VOCs in groundwater, mainly trichloroethylene (TCE) and tetrachloroethylene (PCE), originate from their use as degreasing agents in industrial work at SRS. Tritium in groundwater is a byproduct of nuclear materials production at SRS. Corrective measures at SRS range from active treatment, such as using oxidants to destroy the VOCs in place, to passive or enhanced measures, such as monitored natural attenuation and phytoremediation (using trees and plants to remove or break down contaminants). These practices are removing VOCs from the groundwater and effectively reducing tritium releases from groundwater into SRS streams and the

Chapter 7—Key Terms

Aquifer is an underground water supply found in porous rock, sand, gravel, and other materials.

Attenuation is a reduction of groundwater contaminants over time due to naturally occurring physical, chemical, and biological processes.

Confining unit is the opposite of an aquifer. It is a layer of rock or clay that limits groundwater movement in and out of an aquifer.

Contaminants of concern (COC) are contaminants identified in the risk assessment that are found at a waste unit and pose an unacceptable risk to human health and the environment.

Contaminant of emerging concern (CEC) are currently unregulated contaminants that have not previously been detected in water or are being detected at significantly different levels than expected.

Groundwater is water found underground in cracks and pore spaces in soil, sand, and rocks.

Maximum contaminant level (MCL) is the highest level of a contaminant allowed in drinking water.

Plume is a volume of contaminated water originating at a waste source (for example, a hazardous waste disposal site). It extends downward and outward from the waste source.

Recharge occurs when water from the surface travels down into the subsurface, replenishing the groundwater.

Regional screening level (RSL) is the risk-based concentration derived from standardized equations, combining exposure assumptions with toxicity data.

Remediation cleans up sites contaminated with waste from historical activities.

Surface water is water found above ground (for example, streams, lakes, wetlands, reservoirs, and oceans).

Vadose zone is the subsurface layer below the land surface and above the water table. The vadose zone has a low water content compared to saturated zones; therefore, it is also referred to as being unsaturated.

Savannah River.

7.2 GROUNDWATER AT SRS

The groundwater flow system at SRS consists of four major aquifers separated by confining units:

- Upper Three Runs/Steed Pond
- Gordon/Lost Lake
- Crouch Branch
- McQueen Branch

Groundwater flow in recharge areas normally migrates downward and laterally. It eventually flows into the Savannah River and its tributaries or migrates into the deeper regional flow system. Figure 7-1 presents a three-dimensional block diagram of these units at SRS and the generalized groundwater flow patterns within those units. Water moving from the ground's surface into the aquifers can carry contamination along with it, resulting in underground plumes of contaminated water (Figure 7-2).

Chapter 7—Key Terms (continued)

Waste unit is an area that is, or may be, posing a threat to human health or the environment. It ranges in size from a few square feet to tens of acres and includes basins, pits, piles, burial grounds, landfills, tank farms, disposal facilities, process facilities, and contaminated groundwater.

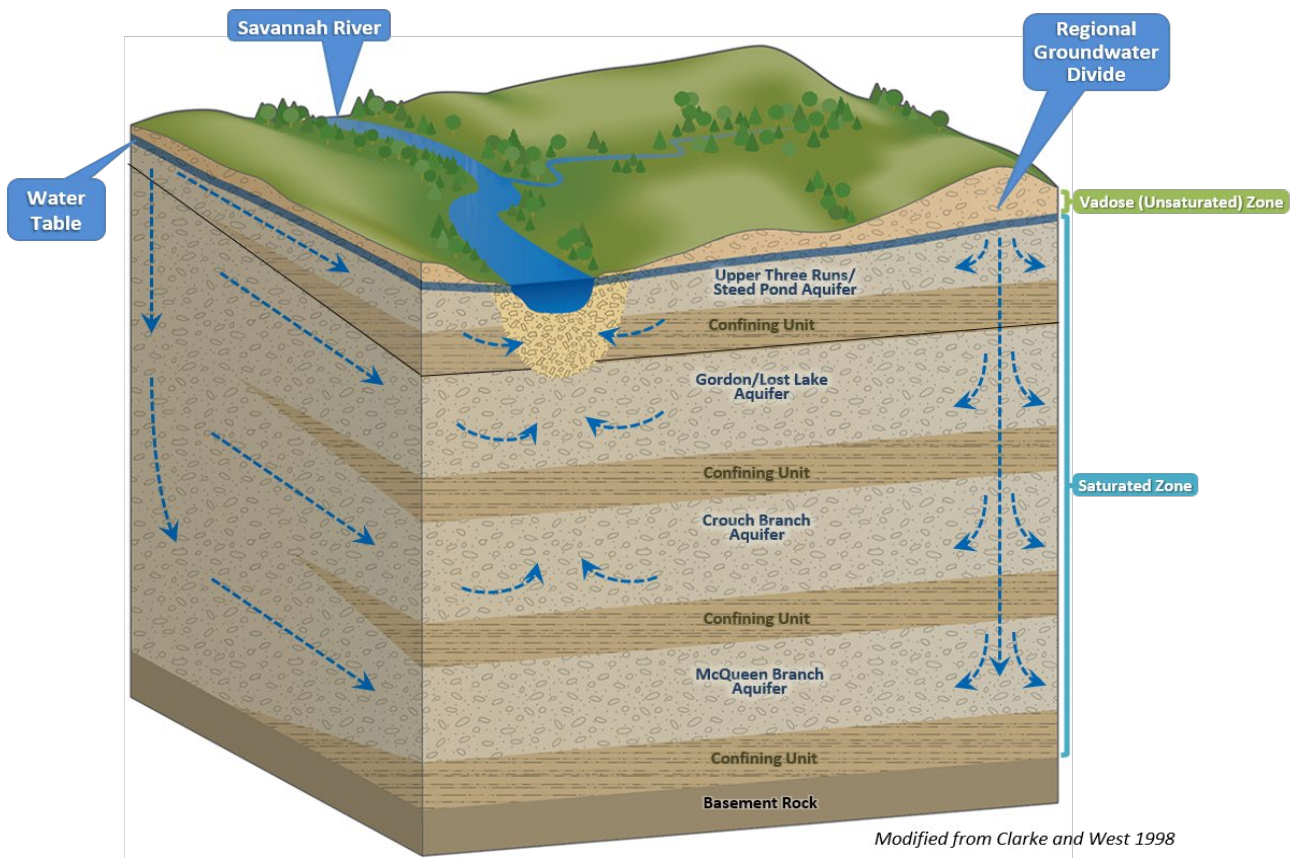


Figure 7-1 Groundwater at SRS

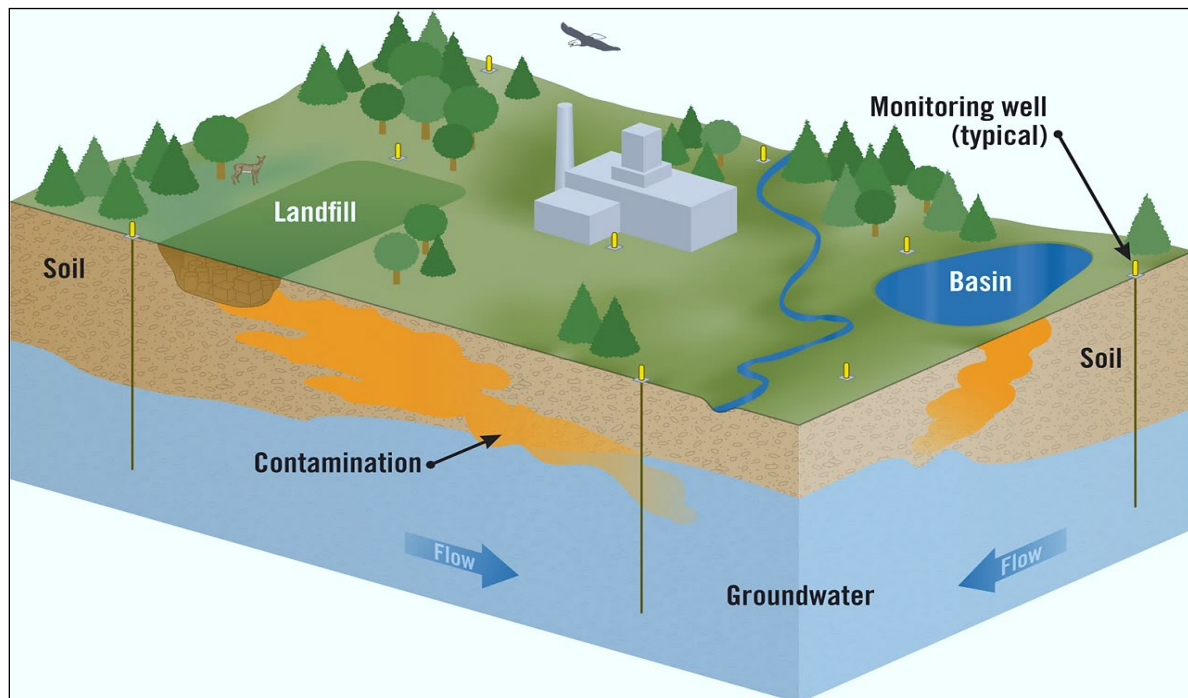


Figure 7-2 How Contamination Gets to Soil and Groundwater

7.3 GROUNDWATER MANAGEMENT PROGRAM AT SRS

SRS has designed and implemented a groundwater management program to prevent new releases to groundwater and to remediate contaminated groundwater to meet federal and state laws and regulations, DOE Orders, and SRS policies and procedures. It accomplishes the following:

- Protects groundwater
- Monitors groundwater
- Remediates contaminated groundwater
- Conserves groundwater

7.3.1 Protecting SRS Groundwater

SRS groundwater management focuses on preventing and monitoring groundwater contamination, protecting the public and environment from contamination, and preserving groundwater quality for future use. SRS protects groundwater by:

- Preventing or controlling groundwater contamination sources from construction sites, hazardous waste management facilities, and waste units
- Monitoring groundwater and surface water to detect contaminants
- Reducing contaminants through a groundwater cleanup program

7.3.2 Monitoring SRS Groundwater

The purpose of monitoring groundwater is to observe and evaluate changes in the groundwater quality over time and to establish, as accurately as possible, the baseline quality of the groundwater occurring naturally in the aquifers. The SRS groundwater monitoring program includes primary components: groundwater contaminant source monitoring and groundwater surveillance monitoring. SRS evaluates groundwater

monitoring data frequently to identify whether new groundwater contamination exists or whether it should modify the current monitoring program.

Monitoring the groundwater around SRS facilities, waste disposal sites, and associated streams is the best way to detect and track contaminant migration. Figure 7-3 shows the groundwater plumes associated with SRS. Through careful monitoring and analysis, SRS implements appropriate remedial or corrective actions.

SRS uses groundwater monitoring data to determine the effects of Site operations on groundwater quality. The program supports the following critical activities:

- Complying with environmental regulations and DOE directives
- Evaluating the status of groundwater plumes
- Evaluating potential impacts from activities planned near or within the footprint of the groundwater plume
- Enhancing groundwater remediation through basic and applied research projects

Increasing national attention to “emerging contaminants” or contaminants of emerging concern (CEC) can prompt a call for action from federal, state, and local governments. Detections of unregulated substances can lead the EPA to require increased monitoring of these substances that may present a risk to human health or the environment. As a result of discussions with the EPA and SCDES, SRS adds emerging contaminants to analyte lists when historical or process knowledge indicates that a contaminant could be of concern. 1,4 Dioxane is one of the previously emerging contaminants that SRS monitors regularly in conjunction with VOC plumes.

Other CECs include per- and polyfluoroalkyl substances (PFAS). PFAS are a family of man-made chemicals that have been manufactured and used worldwide since the 1940s. They are present in various items such as cookware, stain repellants, food packaging, and firefighting foam. Chapter 9, *Per- and Polyfluoroalkyl (PFAS) Substances*, provides more information on PFAS. In 2019, SRS began assessing the past and present use of PFAS at the Site. Groundwater sampling of PFAS was initiated in D Area due to known use of firefighting foam at a former firefighting training area. Sampling has continued into 2024. Results from 2024

groundwater sampling range from less than 1 nanogram/liter (ng/L) up to 2,600 ng/L, which

are similar to previous results. These results from D Area indicate that current PFAS concentrations are related to historical use of firefighting foams. SRS is committed to understanding the full nature and extent of PFAS contamination at SRS. The SRS groundwater monitoring program ensures that there is no cross contamination in samples due to the presence of PFAS in many consumer products. The [EPA](#), [SCDES](#), and the [Interstate Technology Regulatory Council](#) webpages have information on the current state of knowledge and regulatory status of PFAS.



Samplers Collecting PFAS Samples from a PFAS-Free HydraSleeve Bag .

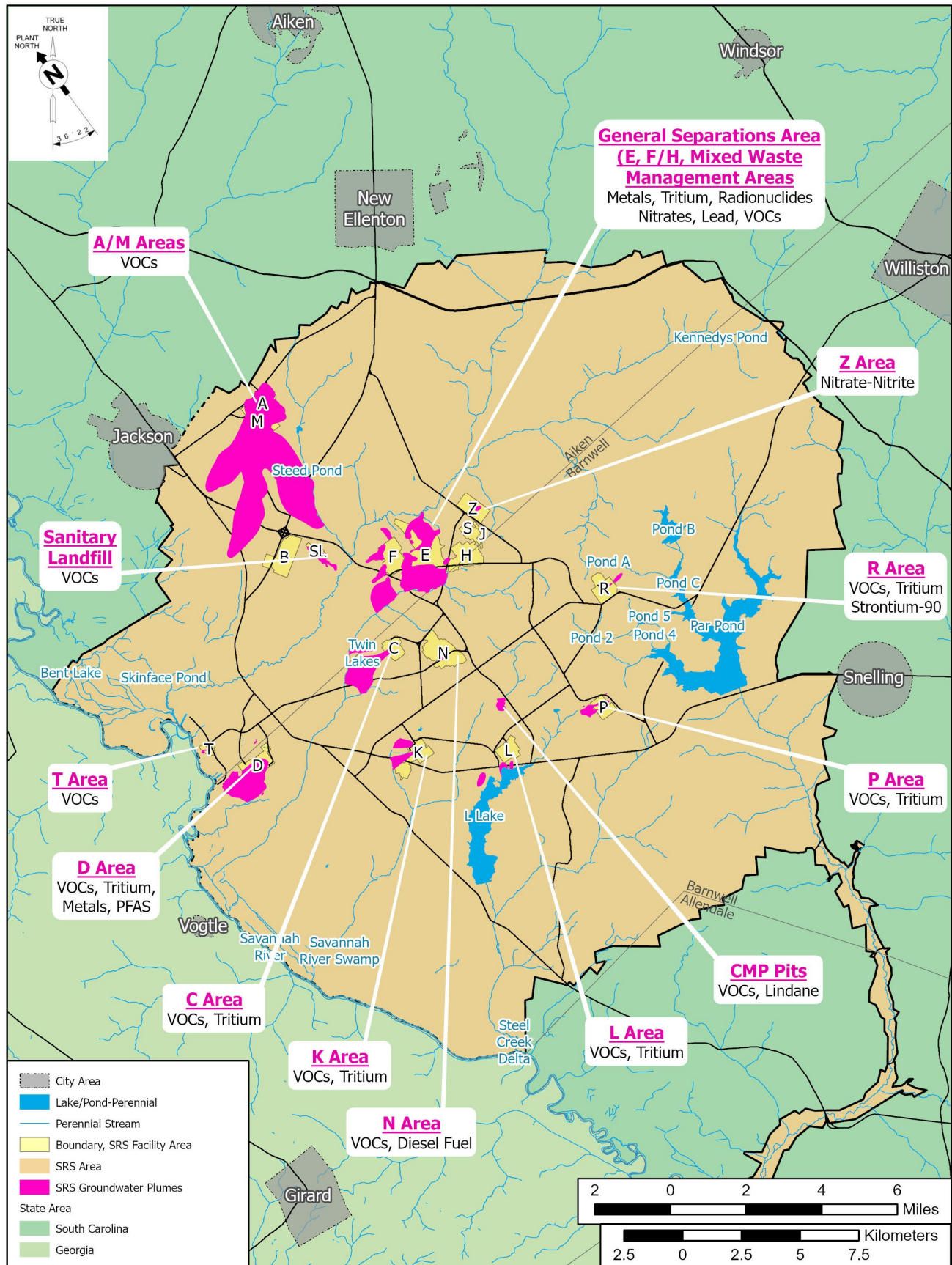


Figure 7-3 Groundwater Plumes at SRS

7.3.2.1 Groundwater Surveillance Monitoring

Surveillance monitoring at SRS focuses on collecting and analyzing data to characterize the groundwater flow and determine the presence or absence of contaminants. Characterization at SRS includes the following activities:

- Collecting soil and groundwater samples to determine the extent of contamination
- Obtaining geologic soil cores or seismic profiles to better determine aquifer and confining unit physical and geochemical properties
- Installing wells to periodically collect water-level measurements and groundwater samples
- Developing maps to interpret groundwater flow, and visualize the extent of horizontal and vertical contamination
- Performing calculations based on water elevation data to estimate groundwater velocities
- Using groundwater modeling to understand future SRS groundwater movement—and specifically contaminant movement—near facilities, individual waste units, and at the Site boundary
- Characterizing regional surface water flow to assess contaminant risk to perennial streams, which receive groundwater flow

7.3.2.2 2024 Groundwater Surveillance Results Summary

SRS uses more than 150 wells to monitor a significant plume beneath A/M Area. Some of these monitoring wells lie within a half-mile of the northwestern boundary of SRS. The direction of groundwater flow in the area is parallel to the Site boundary; however, the flow direction of groundwater can fluctuate. Because of this, SRS concentrates on the groundwater results from the wells along the Site boundary, as well as those between A/M Area and the nearest population center, Jackson, South Carolina (SRNS 2025a). The data show no exceedances of drinking water standards (MCLs or RSLs) in SRS boundary wells near A/M Area. Additionally, no detectable contamination exists in most of these SRS boundary wells.

Although most SRS-contaminated groundwater plumes do not approach the Site boundary, contaminated groundwater discharge potentially affects Site streams that migrate offsite. SRS monitors and evaluates groundwater contamination that discharges into Site streams and remediates it as appropriate. In conjunction with stream monitoring, as discussed in Chapter 5, *Radiological Environmental Monitoring Program*, Section 5.4.3, *SRS Stream Sampling and Monitoring*, SRS conducts extensive monitoring near SRS waste units and operating facilities, regardless of their proximity to the boundary. [Savannah River Site Groundwater Management Strategy and Implementation Plan](#) (SRNS 2020) guides groundwater monitoring activities and facilitates negotiations with EPA and SCDES.

Table 7-1 identifies the typical contaminants of concern (COCs) found in SRS groundwater and their significance. These COCs are a result of historical SRS operations that released chemicals and radionuclides into the soil and groundwater near hazardous waste management facilities and waste disposal sites. Table 7-2 presents a general summary of the most common contaminants found in groundwater at SRS facility areas, based on 2024 monitoring data, and compares the maximum concentrations to the appropriate drinking water standards. This table also shows the major COCs in the groundwater beneath SRS, including common degreasers (TCE and PCE) and radionuclides (tritium, gross alpha, and nonvolatile beta emitters).

Table 7-1 Typical Contaminants of Concern at SRS

Contaminants	Sources	Limits, Exposure Pathways, and Health Effects
Gross Alpha	Alpha radiation emits positively charged particles from radioactive decay of certain elements including uranium, thorium, and radium. Alpha radiation in drinking water can be in the form of dissolved minerals or a gas (radon).	The maximum contaminant level (MCL) is 15 pCi/L. An alpha particle cannot penetrate a piece of paper or human skin. It causes increased risk of cancer through ingestion or inhalation.
Nonvolatile Beta	Beta decay commonly occurs among neutron-rich fission byproducts produced in nuclear reactors.	MCL is 4 mrem/yr. It causes increased risk of cancer through ingestion, inhalation, or dermal exposure.
Tritium	Radioactive isotope of hydrogen with a half-life of 12.3 years. It emits a very weak beta particle and behaves like water.	MCL is 20 pCi/mL. It primarily enters the body when people swallow tritiated water. It causes increased risk of cancer through ingestion, inhalation, or dermal exposure.
Trichloroethylene (TCE) and Tetrachloroethylene (PCE)	Volatile organic compounds (VOCs) used primarily to remove grease from fabricated metal parts.	MCL is 5 µg/L. It causes increased risk of cancer through ingestion, inhalation, or dermal exposure.
Vinyl Chloride	VOC formed as a degradation product of TCE/PCE.	MCL is 2 µg/L. It causes increased risk of cancer through ingestion, inhalation, or dermal exposure.
1,4-Dioxane^a	Synthetic industrial chemical used as a stabilizer for VOCs to reduce degradation.	The regional screening level (RSL) for tap water is 0.46 µg/L. The EPA has classified it as a probable human carcinogen. It has potential acute and chronic health effects.
Per- and Polyfluoroalkyl Substances (PFAS)^a	Constituent in firefighting foams and in consumer products such as cookware, packaging, and stain repellants.	U.S. Environmental Protection Agency (EPA) Drinking Water Lifetime Health Advisory Limit (nonenforceable) is 70 ng/L. Current scientific research suggests that exposure to certain PFAS may lead to adverse health outcomes.

^a Substance identified by the EPA as a contaminant of emerging concern

Table 7-2 Summary of the Maximum Contaminant Concentrations for Major Areas within SRS

Location	Major Contaminant	Units	2024 Max Concentration	Well	MCL/RSL	Likely Stream Endpoints
A/M Area	1,4-Dioxane	µg/L	280	MSB-037-C	6.1 ^a	Upper Three Runs
	Beryllium	µg/L	0.612	MSB-001-B	4	
	Chloroethene (Vinyl Chloride)	µg/L	1.9	ARP-013-B1	2	
	Gross Alpha	pCi/L	19.7	MOX-008	15	
	Nonvolatile Beta	pCi/L	40.1	MSB-064-C	50 ^b	
	Tetrachloroethylene (PCE)	µg/L	100,000	MSB-004-BR	5	
	Trichloroethylene (TCE)	µg/L	40,300	MSB-036-B	5	
C Area	Chloroethene (Vinyl Chloride)	µg/L	77.1	CRP-050-B	2	Fourmile Branch
	Tetrachloroethylene (PCE)	µg/L	8.27	CRP-005-C	5	
	Trichloroethylene (TCE)	µg/L	2,280	CRP-020-CU	5	
	Tritium	pCi/mL	842	CRW-024-C	20	
CMP Pits (G Area)	1,4-Dioxane	µg/L	472	CMP-035-D	0.46 ^a	Pen Branch
	Chloroethene (Vinyl Chloride)	µg/L	1	CMP-025-A	2	
	Lindane	µg/L	6.8	CMP-035-D	0.2	
	Tetrachloroethylene (PCE)	µg/L	2,900	CMP-035-D	5	
	Trichloroethylene (TCE)	µg/L	1,600	CMP-035-D	5	
D Area	1,4-Dioxane	µg/L	3	DOB-016	6.1 ^a	Savannah River
	Aluminum	µg/L	106,000	DCB-022A	20,000	
	Arsenic	µg/L	84	DWP-006-A	10	
	Beryllium	µg/L	87	DCB-023-C	4	
	Chloroethene (Vinyl Chloride)	µg/L	18	DOB-011	2	
	Cobalt	µg/L	343	DCB-070-B	6	
	Iron	µg/L	213,000	DCB-087-A	14,000	
	Manganese	µg/L	20,700	DCB-087-A	430	
	Mercury	µg/L	6.8	DCB-036-C	2	
	Nickel	µg/L	504	DCB-022-A	390	
	Perfluorononanoic acid (PFNA)	ng/L	2,600	DCB-062	10	
	Perfluorooctane sulfonic acid (PFOS)	ng/L	310	DCB-062 DRW-001	4	
	Perfluorooctanoic acid (PFOA)	ng/L	150	DCB-078	4	
	Perfluorohexanesulfonic acid (PFHxS)	ng/L	120	DRW-001	10	
	Tetrachloroethylene (PCE)	µg/L	5.4	DOB-015-A	5	
	Trichloroethylene (TCE)	µg/L	110	DCB-062	5	
	Tritium	pCi/mL	92	DCB-026-AR	20	

Table 7-2 Summary of the Maximum Contaminant Concentrations for Major Areas within SRS (continued)

Location	Major Contaminant	Units	2024 Max Concentration	Well	MCL/RSL	Likely Stream Endpoints
E Area (MWMF)	1,4-Dioxane	µg/L	370	BSW-006-C2	6.1 ^a	Upper Three Runs/ Fourmile Branch
	Gross Alpha	pCi/L	19.3	BGO-43-CR	15	
	Nonvolatile Beta	pCi/L	39	HSP-097-A	50 ^b	
	Strontium-90	pCi/L	18.1	BGX-013-D	8	
	Technetium-99	pCi/L	58.8	HSP-097-A	5	
	Tetrachloroethylene (PCE)	µg/L	40.4	BGO-007-D	5	
	Trichloroethylene (TCE)	µg/L	260	HSB-120-C	5	
	Tritium	pCi/mL	6,580	BGO-037-C	20	
F Area	Gross Alpha	pCi/L	1,610	FGW-005-C	15	Fourmile Branch
	Nonvolatile Beta	pCi/L	669,000	FGW-005-C	50 ^b	
	Strontium-90	pCi/L	340,000	FGW-005-C	8	
	Technetium-99	pCi/L	1,160	FTF-028	50 ^c	
	Trichlorethylene	µg/L	47	FGW-003-C	5	
	Tritium	pCi/mL	127	FGW-012-C	20	
F-Area HWMF	Gross Alpha	pCi/L	415	FSB-095-DR	15	Fourmile Branch
	Nonvolatile Beta	pCi/L	494	FSB-126-D	50 ^b	
	Strontium-90	pCi/L	157	FSB-078-C	8	
	Trichlorethylene (TCE)	µg/L	12.7	FSB-078-C	5	
	Tritium	pCi/mL	1030	FSB-126-D	20	
F-Area Tank Farm	Gross Alpha	pCi/L	7	FTF-020	15	Fourmile Branch/ Upper Three Runs
	Manganese	µg/L	220	FTF=030-D	430	
	Nonvolatile Beta	pCi/L	752	FTF-028	50 ^b	
	Technetium-99	pCi/L	1,110	FTF-028	50 ^c	
H Area	Nonvolatile Beta	pCi/L	22.7	HAA-011-D	50 ^b	Upper Three Runs/ Fourmile Branch
	Tritium	pCi/mL	13.8	HAA-002-D	20	
H-Area HWMF	Gross Alpha	pCi/L	38.9	HSB-102-D	15	Fourmile Branch
	Nonvolatile Beta	pCi/L	546	HSB-102-D	50 ^b	
	Strontium-90	pCi/L	156	HSB-102-D	8	
	Trichloroethylene (TCE)	µg/L	284	HSB-120-C	5	
	Tritium	pCi/mL	2,470	HSB-120-C	20	
H-Area Tank Farm	Manganese	µg/L	218	HAA-010-D	430	Fourmile Branch/ Upper Three Runs
	Nonvolatile Beta	pCi/L	21.3	HAA-004-D	50 ^b	
	Tritium	pCi/mL	29.3	HAA-012-C	20	
K Area	Tetrachloroethylene (PCE)	µg/L	7.3	KDB-001	5	Indian Grave Branch
	Trichloroethylene (TCE)	µg/L	2.32	KRP-009	5	
	Tritium	pCi/mL	885	KRB-019-D	20	

Table 7-2 Summary of the Maximum Contaminant Concentrations for Major Areas within SRS (continued)

Location	Major Contaminant	Units	2024 Max Concentration	Well	MCL/RSL	Likely Stream Endpoints
L Area	Tetrachloroethylene (PCE)	µg/L	56	LSW-025-DL	5	Steel Creek
	Trichloroethylene (TCE)	µg/L	3.52	LSW-030-DL	5	
	Tritium	pCi/mL	354	LSW-025-DL	20	
P Area	1,4-Dioxane	µg/L	4.7	PRP-006	6.1 ^a	Steel Creek/Lower Three Runs
	cis-1,2-Dichloroethylene	µg/L	532	P-003-L	5	
	Tetrachloroethylene (PCE)	µg/L	207	PAO-003-DU	5	
	Trichloroethylene (TCE)	µg/L	5,980	PGW-026-C	5	
	Tritium	pCi/mL	8,950	PSB-002-B	20	
R Area	Strontium-90 ^d	pCi/L	NS	NS	8	Lower Three Runs
	Trichloroethylene (TCE)	µg/L	30.4	RAG-008-B	5	
	Tritium	pCi/mL	292	RDB-003-D	20	
Sanitary Landfill	1,4-Dioxane	µg/L	120	LFW-036-R	6.1 ^a	Upper Three Runs
	Chloroethene (Vinyl Chloride)	µg/L	11	LFW-021	2	
	Trichloroethylene (TCE)	µg/L	5.2	LFW-032	5	
TNX	Trichloroethylene (TCE)	µg/L	23	TRW 2	5	Savannah River
Z Area	Nitrate-Nitrate as Nitrogen	mg/L	5.45	ZBG-002-D	10	Upper Three Runs
	Nonvolatile Beta	pCi/L	83.8	ZBG-002-C	50 ^b	
	Technetium-99	pCi/L	118	ZBG-015-D	50 ^c	

Notes:

MWMF = Mixed Waste Management Facility; HWMF = Hazardous Waste Management Facility; TNX = 678-T facilities; CMP = Chemicals, Metals, and Pesticides Pits; PFAS = Per- and Polyfluoroalkyl Substances; MCL = maximum contaminant level; RSL = regional screening level.

µg = micrograms; mg = milligrams; pCi = picocuries; L = liters; mL = milliliters; NS = not sampled this year

^a The 1,4-Dioxane standard is a Resource Conservation and Recovery Act-permitted Groundwater Protection Standard.

^b The MCL for nonvolatile beta activity (pCi/L or pCi/mL) equivalent to 4 mrem/yr varies according to which specific beta emitters are present in the sample. At SRS, this value equates to 50 pCi/L.

^c The MCL for technetium-99 is the sum of beta dose < 4 mrem/yr and technetium-99 < 900 pCi/L.

^d At R Area, strontium-90 is sampled every two years. It was last sampled in 2023.

Since the early 1990s, SRS has directed considerable effort to assessing the likelihood of flow beneath the Savannah River from South Carolina to Georgia. A groundwater model developed by the U.S. Geological Survey (USGS) indicates there is no mechanism by which groundwater could flow under the Savannah River and contaminate Georgia wells (Cherry 2006). SRS continues to monitor for tritium in groundwater wells in Georgia (Figure 7-4) by collecting samples annually during the second half of the year. Since 1999, detections of tritium in these Georgia offsite wells have been below 1.5 pCi/mL (1,500 pCi/L), which substantiates the results of the USGS groundwater model. As a comparison, the MCL, or drinking water standard, for tritium is 20 pCi/mL (20,000 pCi/L). For 2024, tritium was not detected in any of the groundwater collected at the nine locations sampled. One location was not sampled due to inaccessibility.

7.3.3 Remediating SRS Groundwater

SRS's environmental remediation program has been in place for more than 20 years. [The Federal Facility Agreement \(FFA\) for the Savannah River Site](#) (FFA 1993) specifies that Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

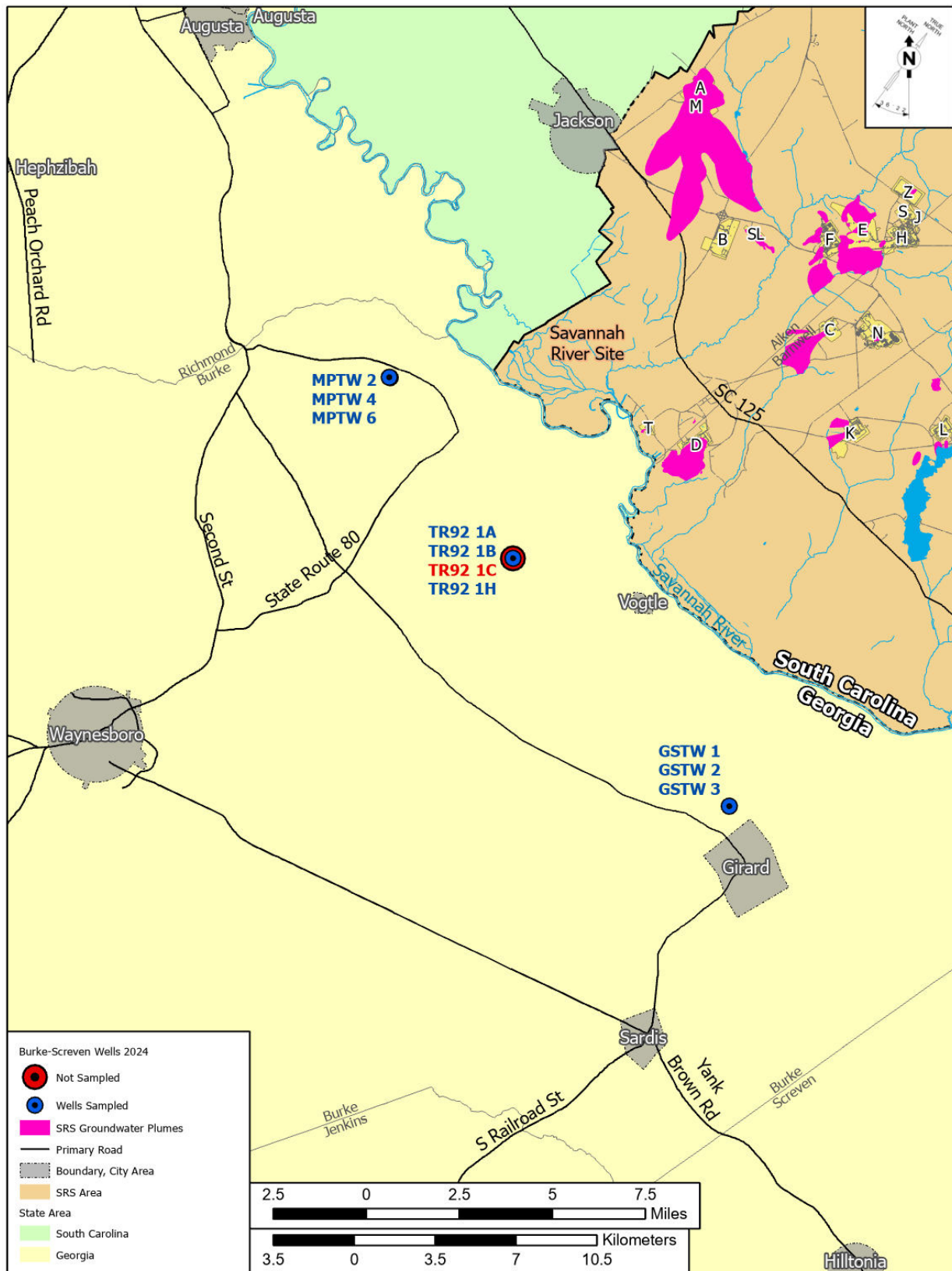


Figure 7-4 Locations of Tritium Monitoring Wells in Burke and Screven Counties, Georgia

regulate the processes of remediating and monitoring contaminated groundwater. Remediation focuses on removing mass, reducing contaminant levels, and reducing the exposure of humans and the environment to contaminants that exceed either the MCLs or RSLs.

For each remediation project, SRS determines the degree of contamination in the groundwater. After this evaluation, SRS and the regulatory agencies decide upon a strategy for remediating the groundwater.

SRS often applies remedial actions to the groundwater contamination source. For instance, SRS widely uses soil vapor extraction, a technology that extracts contaminated soil vapor from the vadose (unsaturated) zone to remove VOCs. This technology minimizes the VOCs that will reach the water table. Recently, SRS has emphasized converting soil vapor extraction systems requiring permanent electrical power to passive systems using solar power or barometric pumping.

SRS implements several other groundwater remedial technologies in the distal portions of the groundwater plumes. These technologies manage the rate the contaminants move and reduce the risk of contaminant exposure to human health and ecological receptors. Forty-one remediation systems are currently operating. In 2024, SRS removed 11,872 pounds (lbs) of VOCs from the groundwater and the vadose zone (SRNS 2025b). Although mass removal rates will vary annually and generally decline over time as less mass is available for removal, SRS is dedicated to continuing to remediate contaminated groundwater.

SRS has worked for more than 20 years to reduce the tritium flux to Fourmile Branch. Since 2000, SRS has reduced the tritium flux to Fourmile Branch by almost 70% using groundwater remedial technologies (subsurface barriers and water capture with phytoremediation). The Mixed Waste Management Facility (MWMF) Phytoremediation Project has the largest reductions of the technologies currently in use on the Site. Since 2001, the MWMF Phytoremediation Project prevented 6,942.5 curies (Ci) of tritium from reaching SRS streams. In 2024, the MWMF Phytoremediation Project prevented 15.5 Ci from reaching SRS streams.

A/M Area is SRS's largest groundwater plume. The earliest identified contamination in the A/M Area plume is associated with the M Area and Metallurgical Laboratory Hazardous Waste Management Facility (HWMF), located in the general proximity of the "M" shown in Figure 7-3. Remediation at these two facilities began in 1983, when SRS pumped groundwater from wells to an above-ground treatment system, followed by soil vapor extraction, and then by thermal treatment. Figure 7-5 shows that as of 2024, these combined technologies have removed 1.63 million lbs of solvent, consisting of TCE and PCE (SRNS 2025a).

Overall, the size, shape, and volume of most SRS groundwater plumes are not significantly increasing because most of the contaminant sources have remediation systems in place. The [Savannah River Site Groundwater Management Strategy and Implementation Plan](#) (SRNS 2020) contains details concerning groundwater monitoring and conditions at individual sites.



A Sampler Installing a Chain of Passive Diffusion Bags in a Well to Obtain Depth Discrete Samples from Multiple Intervals.

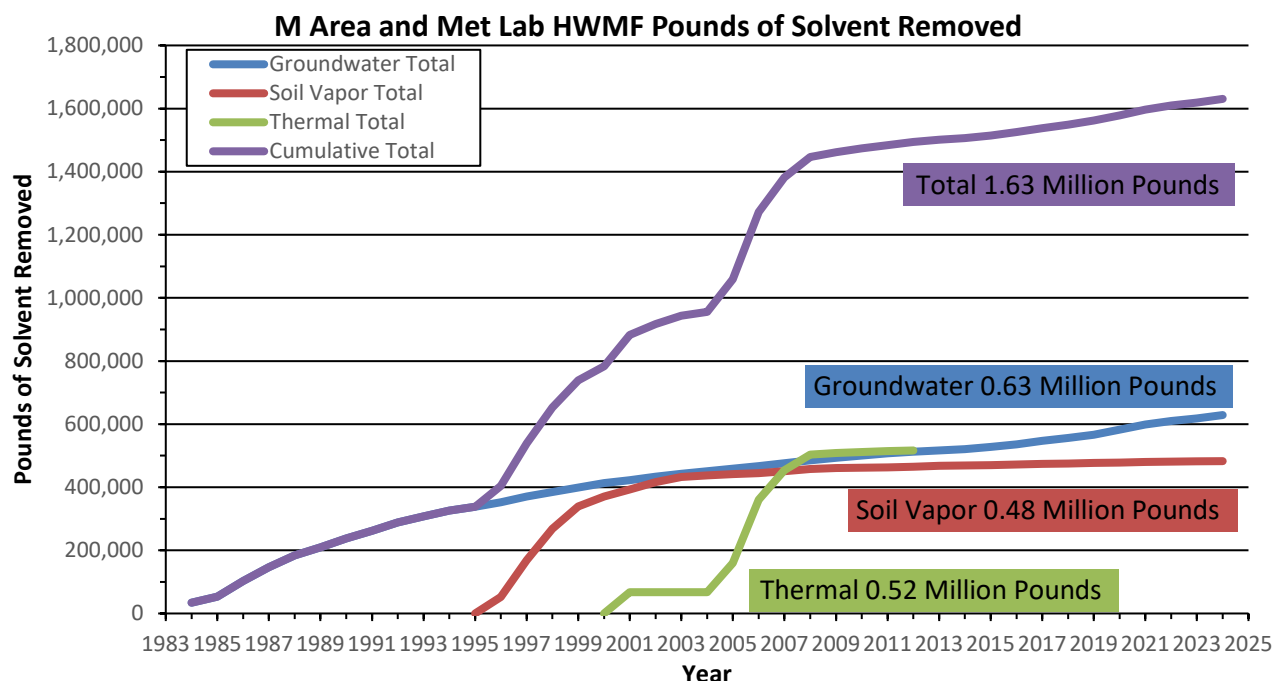


Figure 7-5 Solvent Removed from A/M Area Groundwater Plume

7.3.4 Conserving SRS Groundwater

As in the past, SRS continues to report its drinking and process water use to SCDES. In 2024, SRS used 2.77 million gallons of water per day. Information on SRS water conservation is in Chapter 2, *Environmental Management System*.

SRS manages its own drinking and process water supply from groundwater beneath the Site. Approximately 40 production wells in widely scattered locations across the Site supply SRS domestic and process water systems. Eight of these wells are domestic water systems that supply drinking water. The other 32 wells provide water for SRS facility operations. The 2024 [SRS Environmental Report webpage](#) contains a map of SRS domestic water systems under the *Environmental Maps* heading.

The A Area domestic water system supplies treated water to most Site areas. The system consists of a treatment plant, distribution piping, elevated storage tanks, and a well network. The wells range in capacity from 200 to 1,500 gallons per minute. Remote facilities, such as field laboratories, barricades, and pump houses, use small drinking water systems and bottled water. SRS domestic water systems meet state and federal drinking water quality standards. SCDES samples the systems quarterly for chemical analyses. Monitoring of the A Area water system for bacteria occurs monthly. SCDES performs sanitary surveys every two years on the A Area system and inspects the smaller systems every three years. All 2024 water samples complied with SCDES and EPA water quality standards.

A, F, H, and S Areas have process water systems to meet SRS demands for boiler feedwater, equipment cooling water, facility washdown water, and makeup water. SRS uses the makeup water for cooling towers, fire storage tanks, chilled-water-piping loops, and Site test facilities. Process water wells ranging in capacity from 100 to 1,500 gallons per minute supply water to these systems. In K Area, L Area, and Z Area, the domestic water system supplies the process water system. At some locations, the process water wells pump

to ground-level storage tanks, where SRS implements corrosion control measures. At other locations, the wells directly pressurize the process water distribution piping system without supplemental treatment.

Information on compliance activities associated with the SRS drinking water system is in Chapter 3, *Compliance Summary*, Section 3.3.7.2, *Safe Drinking Water Act (SDWA)*; Chapter 4, *Nonradiological Environmental Monitoring Program*, Section 4.3.2, *Onsite Drinking Water Monitoring*; and Chapter 5, *Radiological Environmental Monitoring Program*, Section 5.4.8, *Drinking Water Monitoring*.

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