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RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION REPORT FOR ASSEMBLY F SOLID WASTE MANAGEMENT UNITS 17, 19, 20, 22, 39 AND 63

MILLINGTON SUPPACT TN

2/4/2000

NAVFAC SOUTHERN

RCRA FACILITY INVESTIGATION REPORT
ASSEMBLY F — SWMUs 17, 19, 20, 22, 39 AND 63
NAVAL SUPPORT ACTIVITY MID-SOUTH
MILLINGTON, TENNESSEE

Revision: 0

CTO-141
Contract Number: N62467-89-D-0318

Prepared for:

Department of the Navy
Southern Division
Naval Facilities Engineering Command
North Charleston, South Carolina

Prepared by:

EnSafe Inc.
5724 Summer Trees Drive
Memphis, Tennessee 38134
(901) 372-7962

February 4, 2000

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The Contractor, EnSafe Inc. hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0318 is complete, accurate, and complies with all requirements of the contract.

Date: February 4, 2000
Signature:
Name: Robert Smith
Title: Task Order Manager

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Acronym List

AF	adherence factor
atm/m^3/mole	atmospheres-cubic meter per mole
ATSDR	Agency for Toxic Substances and Disease Registry
BCT	BRAC Cleanup Team
BAP	benzo(a)pyrene
BEQs	benzo(a)pyrene equivalents
bls	below land surface
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAP	Corrective Action Plan
CDI	chronic daily intake
CEC	cation exchange capacity
cm/sec	centimeter per second
COPCs	chemicals of potential concern
CR	cancer risk
CSI	Confirmatory Sampling Investigation
DAF	dilution attenuation factor
DNAPL	dense non-aqueous phase liquid
DPT	direct-push technology
DQO	data quality objective
DRMO	Defense Reutilization Marketing Office
EPC	exposure point concentration
EPH	extractable petroleum hydrocarbon
ERA	Ecological Risk Assessment
f_{oc}	percent of organic carbon
FSA	full-scan analysis
gpm/ft	gallons per minute/feet
HI	hazard index
HQ	hazard quotient
HHRA	human health risk assessment
IDW	investigation-derived waste
ILCR	incremental lifetime cancer risk
IR	infrared

k_d	distribution coefficient
kg	kilogram
k_{oc}	organic carbon partition coefficient
L/day	liter per day
MCL	maximum contaminant level
MEK	methyl ethyl ketone
mg/kg	milligram per kilogram
mg/day	milligram per day
mg/L	milligram per liter
mm/Hg	millimeters of mercury
NEX	Navy Exchange
NAS	Naval Air Station
NSA	Naval Support Activity
OSWER	Office of Solid Waste and Emergency Response
PCBs	polychlorinated biphenyls
PID	photoionization detector
POTW	publicly owned treatment works
ppm	parts per million
PRE	preliminary risk evaluation
PVC	polyvinyl chloride
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RBC	risk-based concentration
RC	reference concentration
RFA	RCRA Facility Assessment
RfD	reference dose
RFI	RCRA Facility Investigation
RG	remedial goal
RGO	remedial goal option
RME	reasonable maximum exposure
SF	slope factor
SSL	soil screening level
SG	specific gravity
SQL	sample quantitation limit
STP	standard temperature and pressure
SVOCs	semivolatile organic compounds
SWMU	solid waste management unit

TCE	trichloroethene
TCLP	toxicity characteristic leaching procedure
TDEC	Tennessee Department of Environment and Conservation
TEF	toxicity equivalence factor
TPH	total petroleum hydrocarbon
TPH-DRO	total petroleum hydrocarbons-diesel range organics
TPH-GRO	total petroleum hydrocarbons-gasoline range organics
UST	underground storage tank
UWT	underground waste tank
VCA	Voluntary Corrective Action
VOCs	volatile organic compounds

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EXECUTIVE SUMMARY

As part of the U.S. Navy Installation Restoration program, this follow RFI report has been prepared for six Assembly F SWMUs on NSA Mid-South, Millington, Tennessee. The SWMUs required an RFI to identify and characterize known releases of hazardous constituents. As a result of the closure of Naval Air Station Memphis and its realignment as a Naval Support Activity, there have been several name changes at NSA Mid-South. Before October 1, 1995, the installation operated as NAS Memphis. From October 1, 1995, to October 1, 1998, the installation was known as NSA Memphis. On October 1, 1998, NSA Memphis was renamed to NSA Mid-South or NAVSUPPACT Mid-South. This RCRA Facility Investigation, which was undertaken by EnSafe Inc., adhered to the requirements of the Hazardous and Solid Waste Amendments portion of RCRA Permit No. TN2-170-022-600 and applicable regulations.

SWMU	Name
17	Former location of UWT S-9 (Southside)
19	Former location os UWT N-1648 (Northside)
20	Former location of UWT S-1594 (Southside)
22	Former locations of USTs S-1244, 1245 and 1246 (Southside)
39	Former location of base laundry (Building S-74, Southside)
63	Former location of UWT S-75N

SWMU 17 SUMMARY

Site Description and History

SWMU 17, former UWT S-9, is reported to have received used automotive oil and used hydraulic fluid generated during automobile maintenance at Building S-9. The tank was installed in 1979 and used until 1996 when it was removed; however, the initial date of oil storage is not known. SWMU 17 is approximately 100 feet east of Kearsarge Avenue in the Building S-9 complex. The immediate area is covered by asphalt and gravel and descends slightly to the south and west toward SWMU 38. SWMU 17 has been the subject of a RCRA Facility Assessment (RFA) (ERC/EDGe, 1990), Voluntary Corrective Action (VCA) tank and soil removal, and a Confirmatory Sampling Investigation (CSI). Soil and groundwater samples collected as part of the VCA and CSI indicated a release from UWT S-9.

SWMU 17 RFI Sampling Rationale

Because nature and extent were sufficiently characterized duing the CSI, no soil or groundwater samples were collected during the RFI. Instead, the CSI data were used to conduct a human health risk assessment (HHRA) for site constituents, thereby fulfilling the RFI requirements. Because no quality habitat exists at SWMU 17, ecological risk was not addressed.

The SWMU 17 CSI included sampling surface and subsurface soil and groundwater around the former tank location, and subsurface soil along the former pipe trench that ran from the tank to Building S-9 using direct-push technology. The sampling media, intervals, analyses, and rationale are listed in the following table.

SWMU 17 Sample Summary

Media	Number of Samples	Interval Sampled (feet bls [a])	Analysis	Purpose
Surface Soil	1	0 to 1	FSA [b]	To determine any impact to surface soil and collect data to conduct ecological and human health risk assessments.
Subsurface Soil	9	13 to 15	FSA	To determine extent of impact to subsurface soil, if any.
Surface Soil	3	0 to 2	TPH Field Screening [c]	To determine magnitude and extent of TPH impact to soil along the former pipe trench.
Subsurface Soil	15 18 1 1 1	2 to 3 3 to 4 4 to 5 6 to 7 7 to 8	TPH Field Screening	To determine magnitude and extent of TPH impact to soil along the former pipe trench.
Groundwater	5	49	VOCs	To determine groundater quality in the fluvial deposites and to conduct an HHRA.

Notes:

[a]bls — below land surface

[b]FSA — Full-Scan Analysis. FSA consists of the following compound list parameters: VOCs by SW-846 Method 8260; SVOCs by SW-846 Method 8270; chlorinated pesticides/PCBs by SW-846 8080; Appendix IX Methals and cyanide by SW-846 Methods 6010, 7060, 7241, 7841, and 9012; and total petroleum hydrocarbons - gasoline- and diesel-range organics (TPH-GRO and TPH-DRO) by the Modified Tennessee SW-846 Method 8015.

[c]TPH — (total petroleum hydrocarbons) Field Screening was conducted in the field with an infrared TPH analyzer.

SWMU 17 Analytical Results

This discussion presents only contaminants that exceeded USEPA screening values for soil and groundwater that were pertinent to the HHRA and fate and transport evaluations.

Soil Contaminants: VOCs, SVOCs, TPH, chlorinated pesticides, and Appendix IX metals were detected in SWMU 17 soil samples. Benzene, tetrachloroethene, naphthalene, heptachlor epoxide, and antimony exceeded at least one screening value in a limited number of soil samples. These compounds were also identified as contaminants of concern (COCs) based on fate and transport evaluations. HHRA evalutions did not identify any COCs in SWMU 17 soil.

TPH was detected at four locations along the former pipe trench at concentrations that exceeded the activity's clean-up level of 100 μg/kg for TPH in soil less than 5 feet bls. No detections exceeded the 1,000 μg/kg TPH clean-up level assigned to SWMU 17 based on its soil permeability.

Groundwater Contaminants: The VOCs benzene and 1,2-dichloropropane exceeded one or more screening values in fluvial deposits groundwater samples. Both contaminants affected the HHRA and fate and transport evaluations.

Benzene exceeded its tap water RBC of 3.6E-1 micrograms per liter (μg/L) in one fluvial deposites groundwater sampling location at a concentration of 1.1 μg/L. The hazard index (HI) calculated for benzene is 1. Although benzene was detected in both soil and groundwater and it is relatively mobile, it was only detected in three of nine subsurface soil sampling locations and one groundwater sampling location, suggesting it is not widespread at this site.

1,2-Dichloropropane exceeded its tap water RBC of 1.6E-1 μg/L and its maximum contaminant level (MCL) of 5μg/L in one location at a concentration of 28 μg/L. The incremental lifetime cancer risk (ILCR) calculated for 1,2-dichloropropane is 3.00E-5. 1,2-Dichloropropane is mobile in soil and groundwater and has the potential to leach into groundwater and move with it.

However, this compound was not detected in soil and was detected in only one groundwater sample, suggesting it is not widespread at the site.

SWMU 17 Recommendations

A Voluntary Corrective Action is recommended to remove the TPH-contaminated soil along the pipe trench in the areas where TPH exceeds 100 mg/kg in the first 5 feet bls. This VCA is planned for spring 2000. No further action is recommended for SWMU 17 after the soil is removed.

SWMU 19 SUMMARY

Site Description and History

SWMU 19, the former location of UST N-1648, is approximately 150 feet north of Navy Road. It is bounded to the north by a wooded area and Assembly G SWMU 49 (a former hazardous-waste accumulation point for Building N-757) and to the south by Navy Road and Building 341 of the Navy Exchange Service Station. This SWMU is bordered to the east by Building 757 and to the northwest by the former Aircraft Fire Fighting Training Facility (SWMU 5). SWMU 19 is reported to have operated as a UST from 1983 through 1992. The immediate area, which is asphalt, descends slightly west and northwest toward two storm drains and a wooded area to the north. Both storm drains discharge into a ditch that drains SWMU 5 and leads into a tributary of North Fork Creek. This site has been the subject of a tank removal and CSI. Data collected during these activities indicate that a release may have occurred before the tank's removal.

SWMU 19 RFI Sampling Rationale

Because nature and extent were characterized during the CSI, no additional soil or groundwater samples were collected during the RFI. Instead, the data obtained during the CSI were used to conduct a human health risk assessment for site constituents, thereby fulfilling the RFI requirements. Because no quality habitat exists at SWMU 19, ecological risk was not addressed.

The SWMU 19 CSI included sampling surface and subsurface soil and groundwater around the former tank location using DPT. The sampling media, intervals, analyses, and rationale are listed in the following table.

SWMU 19 Sample Summary

Media	Number of Samples	Interval Sampled (feet bls [a])	Analysis	Purpose
Surface Soil	2	0 to 1	FSA [b]	To determine any impact to surface soil and to collect data to conduct ecological and human health risk assessments.
Subsurface Soil	4	12 to 15	FSA	To determine extent of any impact to subsurface soil.
Groundwater	3 –	49	VOCs	To determine groundater quality in the fluvial deposites and to conduct an HHRA.

Notes:

[a]bls — below land surface

[b]FSA — Full-Scan Analysis. FSA consists of the following compound list parameters: VOCs by SW-846 Method 8260; SVOCs by SW-846 Method 8270; chlorinated pesticides/PCBs by SW-846 8080; Appendix IX Methals and cyanide by SW-846 Methods 6010, 7060, 7241, 7841, and 9012; and total petroleum hydrocarbons - gasoline- and diesel-range organics (TPH-GRO and TPH-DRO) by the Modified Tennessee SW-846 Method 8015.

SWMU 19 Analytical Results

This discussion presents only those contaminants that exceeded USEPA screening values for soil and groundwater that were pertinent to the HHRA and fate and transport evaluations.

Soil Contaminants: VOCs, SVOCs, pesticides, TPH, and Appendix IX metals were detected in SWMU 19 soil samples. Acetone, benzene, ethylbenzene, toluene, xylene, naphthalene, 2-methylnaphthalene, and heptachlor epoxide exceeded at least one screening value in a limited number of soil samples. Benzene and toluene affected fate and transport evaluations. No soil contaminants affected the HHRA evaluations.

TPH exceeded its 1,000 μg/kg soil clean-up level for soil at one location.

Groundwater Contaminants: No compounds exceeded any groundwter screening values at SWMU 19.

SWMU 19 Recommendations

Building N-757 is scheduled for demolition in fiscal year 2000. Once demolished, a VCA will be implemented at SWMU 19 to address the TPH contamination exceeding 1,000 μg/kg. After the VCA has been completed, no further action is recommended for SWMU 19.

SWMU 20 SUMMARY

Site Description and History

SWMU 20, former 100-gallon UWT S-1594, is approximately 200 feet west of Hornet Avenue and Comittment Loop and southeast of Building 1594 on the Southside. It is reported to have stored waste oil and waste hydraulic fluid generated by the Air Traffic Control School. The tank's installation date is unknown; it was removed in May 1992. The immediate area is covered by asphalt, while surrounding areas have grass cover. The surface drains toward the south and west to SWMU 38. SWMU 20 has been the subject of an RFI, a tank removal, and a CSI. Soil and groundwater samples collected during the removal and CSI indicated a release from UWT S-1594.

SWMU 20 RFI Sampling Rationale

RFI sampling at SWMU 20 consisted of collecting subsurface soil and groundwater samples around the former tank's location using DPT. Three piezometers and one fully penetrating groundwater monitoring well were installed for groundwater sample collection. No surface soil samples were collected during the RFI. The data from CSI surface soil samples were used for HHRA calculations. Because no quality habitat at SWMU 20, ecological risk was not addressed.

The sampling media, intervals, analysis and rationale are listed in the following table.

SWMU 20 Sample Summary

Media	Number of Samples	Interval Sampled (feet bls [a])	Analysis	Purpose
Subsurface Soil	2 2	5 to 7 11 to 13	VOC	To determine the vertical extent of compounds detected in CSI soil samples.
Groundwater (DPT)	3 3 3	40 50 60	VOC	To determine lateral and vertical extent of compounds detected in CSI groundwater samples.
Groundwater (Piezometers)	3	55 to 60 (screened interval)	VOC	To determine groundwater flow direction, provide reproducable sample locations, and aid in well placement.
Groundwater (monitoring well)	1 1 -1	49 67 74	VOC	To confirm lateral and vertical extent downgradient from the former tank.

Note:
[a]bls — below land surface

SWMU 20 Analytical Results

This discussion presents only contaminants that exceededUSEPA screening values for soil and groundwater that were pertinent to the HHRA and fate and transport evaluations.

Soil Contaminants: SWMU 20 RFI samples were analyzed for VOCs only. Acetone, benzene, 1,2-dichloropropane, 1,1-dichloroethane, 1,1-dichloroethene, methylene chloride, tetrachloroethene, 1,1,2-trichloroethane, and TCE were detected in subsurface soil at concentrations that exceed at least one screening value. None of these compunds affected HHRA or fate and transport evaluations.

Groundwater Contaminants: Acetone and methyl ethyl ketone (MEK) were detected in groundwater samples collected using DPT. However, neither exceeded its tap water RBC or MCL. The HHRA identified seven COCs in CSI and RFI groundwater samples. The compounds and their ILCRs and HIs are listed below.

COC	ILCR	HI
1,1,2-trichloroethane	2E-5	11
1,1-dichloroethane	NA	6
1,2-dichloroethane	9E-6	0.2
1,1-dichloroethene	6E-4	22
acetone	NA	0.2
benzene	4E-6	8
MEK	NA	0.3

SWMU 20 Recommendations

No further action is recommended for SWMU 20 based on the absence of solvent detections in the fluvial deposits groundwater downgradient of the suspected release point, and because the HHRA did not identify any COCs.

SWMU 22 SUMMARY

Site Description and History

SWMU 22 consists of four former USTs west of Building S-75 (the boiler plant). They were installed in approximately 1944, but their removal date is unknown. Tanks 1244, 1245, and 1246 stored fuel oil for the boiler plant and an unnumbered tank stored diesel fuel. USTs 1245 and 1246 each held 25,000 gallons, UST 1244 held 50,000 gallons, and the diesel UST held 280 gallons. The three large USTs were constructed of concrete with steel piping, while the diesel UST and piping were steel. The SWMU area is covered by gravel, concrete, or asphalt and surrounding areas have grass cover. Surface drainage is to the west to SWMU 38. SWMU 22 has been the subject of a tank removal and CSI. Soil samples collected during the tank removal and CSI indicate that a release may have occurred from at least UST.

SMWU 22 Sampling Rationale

Soil samples were collected from within the backfilled tank pits because historical information indicates that the soil from the tank removal may have been pushed back in the pits instead of clean soil. Because of the nature of the contaminants and the hydraulically downgradient location

of SWMU 22, its groundwater was addressed as part of the SWMU 39 investigation. CSI data were used for HHRA calculations. The sampling media, intervals, analysis, and rationale for SWMU 22 samples are listed in the following table.

SWMU 22 Sample Summary

Media	Number of Samples	Interval Sampled (feet bls [a])	Analysis	Purpose
Subsurface Soil	2	2 to 4	EPH[b] and TPH-GRO[c]	To determine if TPH-contaminated soil was pushed back into the tank pit after the USTs were removed and to determine the magnitude and vertical extent of any contamination.
	2	4 to 6		
	1	6 to 8		
	2	8 to 10		
	1	10 to 12		
	5	18 to 20		

Notes:

a — below land surface

b — Extractable petroleum hydrocarbons

c — Total petroleum hydrocarbons - gasoline range organics by the Modified Tennessee SW-846-Method 8015.

SWMU 22 Analytical Results

No permeability data are available for SWMU 22, so the more concervative clean-up level of 500 μg/kg for TPH in soil was assigned to this site. TPH exceeded this clean-up level in three samples at concentration ranging from 553 to 3,707 μg/kg. All three samples were collected from the same tank pit.

The HHRA identified arsenic and benzo(a)pyrene as COCs in SWMU 22 soil. The ILCRs and HIs for arsenic are 6E-5 and 1 (resident) and 2E-6 and 0.03 (trespasser). The ILCR for benzo(a)pyrene is 9E-6 (resident).

SWMU 22 Recommendations

A VCA is recommended to remove all soil in which TPH exceeds the 500 μg/kg clean up level. After the petroleum-contaminated soil has been removed, no further action is required at SWMU 22.

SWMU 39 SUMMARY

Site Description and History

SWMU 39, which is approximately 300 feet south of Kearsarge Avenue and Intrepid Street across from the boiler plant on the Southside, consists of the area surrounding the concrete slab remaining from Building S-74. Transformers and drums of oil were stored in the PCB storage area (an outdoor concrete slab) until Building S-74 was demolished in 1995. Building S-74 was built in 1943 and operated as a laundry until 1981 (38 years). Building S-212, which also occupied the area, was constructed in 1947 to store solvent for S-74. The remaining building foundation is concrete, while surrounding areas are covered with grass. Surface drainage is toward the south and west to SWMU 38.

The SWMU 39 investigation area also includes SWMUs 22 and 63. Both SWMUs were investigated as one site because SWMU 22 is hydraulically downgradient of SWMU 39, adjacent to it, and similar compounds were detected at both sites during the CSI. SWMU 63 is in the SWMU 39 investigation area. However, because no contamination was identified in any CSI samples collected at this SWMU, no samples were collected during the RFI. Previous SWMU 39 investigations consist of a preliminary groundwater assessment, a UST removal, and a CSI. Samples collected during these investigations indicate an impact to soil and loess and fluvial deposits groundwater.

SWMU 39 Sampling Rationale

The SWMU 39 RFI included sampling surface and subsurface soil and groundwater from the loess and fluvial deposits. The HHRA conducted for this site evaluated both the CSI and RFI data. The RFI sampling media, intervals, analyses, and rationale are listed in the following table.

SWMU 39 Sample Summary

Media	Number of Samples	Interval Sampled (feet bls [a])	Analysis	Purpose
Surface Soil	5	0 to 1	VOC	To determine if the surface soil beneath the Building S-74 slab had been impacted by dry-cleaning activities conducted at the base laundry.
Subsurface Soil	1 1	9 to 11 11 to 13	VOC	To determine extent of any impact to subsurface soil.
Groundwater (DPT)	11 40 50 60	12 to 14 (loess) 40 (fluvial) 50 (fluvial) 60 (fluvial)	VOC	To determine magnitude and extent of the VOCs in groundwater detected in CSI groundwater samples.
Groundwater (piezometers)	5 –	55 to 60	VOC	To determine groundwater flow direction, provide reproducable sample locations, and aid in well placement.
Groundwater (monitoring wells)	25 8 5	40 to 69 70 to 89 90 to 109	VOC	To determine groundater quality in the fluvial deposites and conduct an HHRA.

Note:
a — below land surface

SWMU 39 Analytical Results

This discusstion present only contaminants that exceeded USEPA screening values for soil and groundater that were pertinent to the HHRA and fate and transport evaluations. Both CSI and RFI data were evaluated in the HHRA.

Soil Contaminants: cis-1,2-Dichloroethene, tetrachloroethene, and TCE exceeded their SSLs in one surface soil sample collected from beneath the remaining slab of Building S-74. Acetone exceeded its SSL in one subsurface sample. Fate and transport evaluations identified all four compounds as COCs because VOCs have a relatively high mobility. However, tertrachloroethene was detected in only one surface sample and was not detected in subsurface soil or groundwater, suggesting its extent is limited. While TCE was detected in groundwater, it was not seen in samples collected downgradient of the Building S-74 slab suggesting limited TCE migration in this area. None of these compounds were identified as a COC in the HHRA. From

the CSI data, the HHRA determined dieldrin to be a COC in SWMU 39 soil. The ILCR and HI for dieldrin were estimated to be 5E-6 and 0.043, respectively.

Groundwater Contaminants: Benzene and 1,2-dichloroethene exceeded at least one screening value in one of 11 loess deposits groundwater samples. Chloromethane, 1,2-dichloroethane, 1,2-dichloroethene, and TCE exceeded at least one screening value in fluvial deposits groundwater samples. Of these compounds, only 1,2-dichloroethene and TCE affected the HHRA and fate and transport evaluations.

1,2-Dichloroethene exceeded its tap water RBC (3.6E-1 μg/L) and its MCL (5 μg/L) in one loess deposits groundwater sample and its MCL in two fluvial deposits groundwater samples. The HHRA calculations estimated an HI of 6 in loess groundwater and 5 in fluvial deposits groundwater. 1,2-Dichloroethene was detected in both loess and fluvial deposits groundwater and the fate and transport disucssions suggest high mobility for this compound. However, the detections were few compared to the total number of samples, suggesting that 1,2-dichloroethene is not widespread at the site.

TCE exceeded its tap water RBC (1.6 μg/L) in 15 samples and its MCL (5 μg/L) in 13 samples collected from the fluvial deposits. Most detections were west of Building S-203 and north of former Building S-74, suggesting that the TCE in groundwater did not originate from dry-cleaning in the base laundry. It is possible that activities once conducted in Building S-203 may have been the source.

SWMU 39 Recommendations

A Corrective Measures Study should be implemented to address the chlorinated solvents and petroleum-related compounds detected in soil and loess groundwater and to evaluate the chlorinated solvents detected in fluvial deposits groundwater. The CMS should further delineate soil contamination beneath the slab and evaluate potential exposure risks created by removal of the Building S-74 slab. Impact to the loess groundwater appears to be isolated; however, as part of the CMS, a loess groundwater monitoring program should be implemented to ensure that

migration is not occurring. The CMS will also evaluate remedial alternatives for the SWMU 39 fluvial deposits groundwater contamination.

SWMU 63 SUMMARY

SWMU 63 consists of an approximately 7-foot by 7.5-foot area adjacent to the southwest corner of Building S-75, the former location of a 65-gallon, stainless-steel UWT. When the UWT was removed in April 1992, no soil contamination was evident. The SWMU areas are covered by gravel, concrete or asphalt and surrounding areas have grass cover. Surface drainage is toward the west to SWMU 38.

SWMU 63 Sampling Rationale

No samples were collected during the RFI, because CSI sampling indicated that there was no release from this tank.

SWMU 63 Recommendations

No further action is recommended at SWMU 63 because area soil is not contaminated and groundwater is addressed under the SWMU 39 investigation.

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1.0 INTRODUCTION

As part of the U.S. Navy Installation Restoration program, the following Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) report has been prepared for six Assembly F Solid Waste Management Units (SWMUs) on Naval Support Activity (NAVSUPPACT or NSA) Mid-South, Millington, Tennessee. As a result of the closure of Naval Air Station (NAS) Memphis and its realignment as a Naval Support Activity, there have been several name changes at NSA Mid-South. Before October 1, 1995, the installation operated as NAS Memphis. From October 1, 1995 to October 1, 1998, the installation was known as NSA Memphis. On October 1, 1998, NSA Memphis was renamed to NSA Mid-South or NAVSUPPACT Mid-South.

Eight SWMU assemblies (i.e., groups) have been defined for the NSA Mid-South RCRA Corrective Action Program (CAP) as a result of the Base Closure and Realignment Act of 1990. Assemblies A, B, C, and D, which are on closing portions of the base, have been categorized and ranked according to their Base Realignment and Closure (BRAC) status. Assemblies E, F, G, and H are on portions of the base that will remain open. The RCRA Facility Investigation, which was undertaken by EnSafe Inc., adhered to the requirements of the Hazardous and Solid Waste Amendments portion of RCRA Permit No. TN2-170-022-600 and applicable regulations.

The Assemby F RFI SWMUs are:

- SWMU 17 The former location of an underground tank in the Building S-9 complex on the Southside

- SWMU 19 The former location of underground storage tank (UST) 1648 in the Navy Exchange (NEX) service station area on the Northside

- SWMU 20 The former location of underground waste tank (UWT) 1594 in the former air traffic controller school area on the Southside

- SWMU 22 Four USTs west of Building S-75 (Boiler Plant) on the Southside

- SWMU 39 The site of former Building S-74 on the Southside, which originally housed the base laundry and dry cleaning facility, and was later used as a storage area for transformers that contained polychlorinated biphenyls (PCBs)

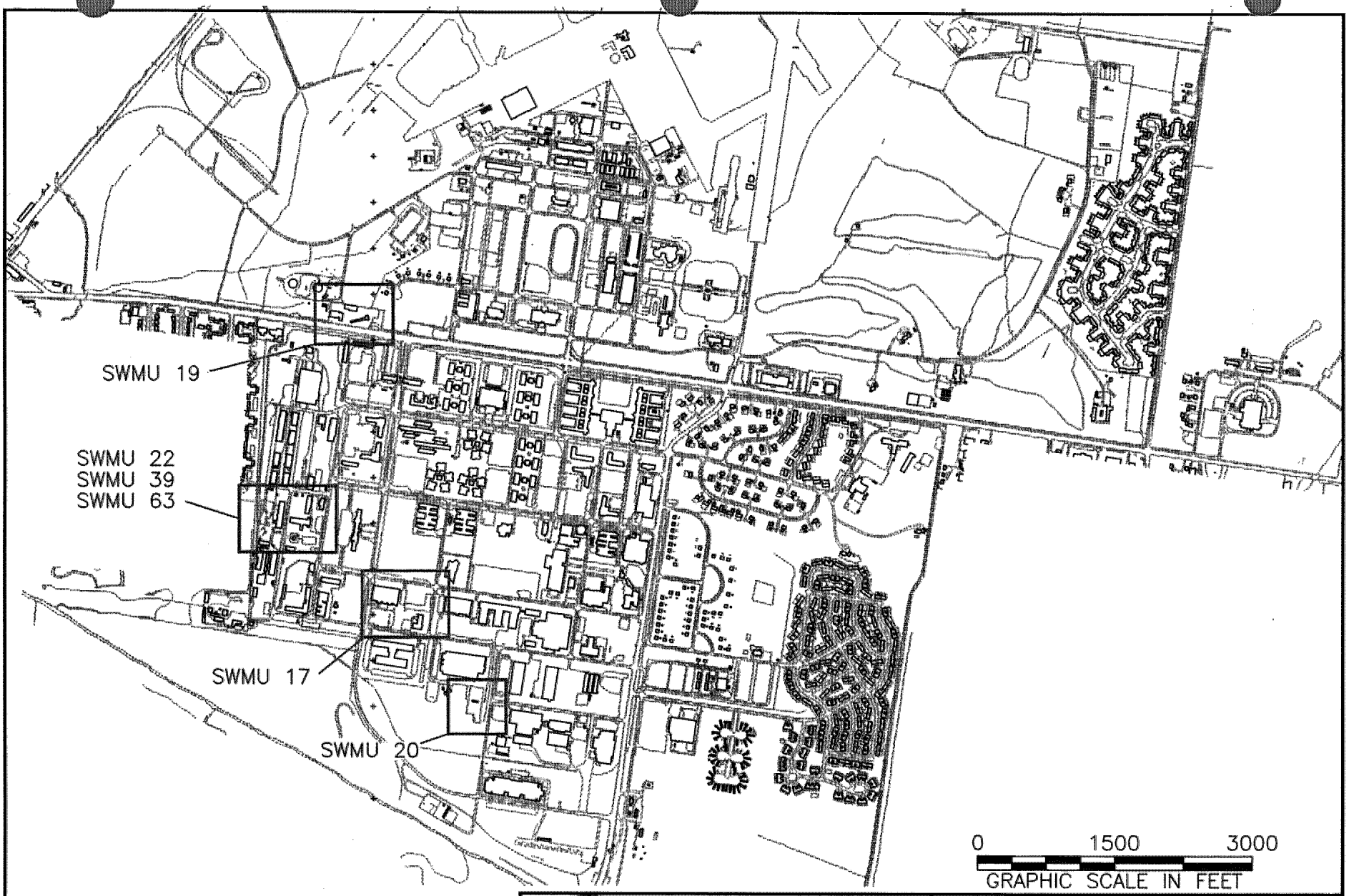
- SWMU 63 The former location of a 65-gallon, stainless-steel UWT adjacent to the southwest corner of Building S-75 on the Southside

1.1 Assembly F SWMU Descriptions and Site Histories

This section describes each Assembly F SWMU's site locations and past histories. Figure 1.1 shows their locations. The SWMUs and the areas around them, are characterized by relatively level, low-relief topography. Many of these areas flow toward a north-south drainage ditch known as SWMU 38, which flows south into the Big Creek Drainage Canal. The regional and local hydrogeology are described in Section 2.11 and 2.12 of the *Comprehensive RFI Work Plan, Naval Air Station Memphis, Millington, Tennessee* (E/A&H, 1994) and in Section 2 of this report.

1.1.1 SWMU 17

SWMU 17, a former underground tank (Tank S-9) is reported to have received used automotive oil and used hydraulic fluid generated during automobile maintenance at Building S-9. Tank S-9 was installed in 1979 and used until 1996 when it was removed; however, the initial date of oil storage is not known. SWMU 17 is approximately 100 feet east of Kearsarge Avenue in the Building S-9 complex (Figure 1.2). No evidence of a release was visible at SWMU 17 during the RCRA Facility Assessment (RFA) (ERC/EDGe, 1990); however data from the June 1996 Voluntary Corrective Action (VCA) tank and soil removal at SWMU 17 indicate that a release had occurred before the tank was removed. (See Section 7.1 of the Confirmatory Sampling Investigation (CSI) work plan [E/A&H, 1996]).



ASSEMBLY F
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MILLINGTON, TENNESSEE

FIGURE 1.1
NSA MID-SOUTH
SWMU LOCATION MAP

DWG DATE: 01/25/00 | DWG NAME: 0141R003

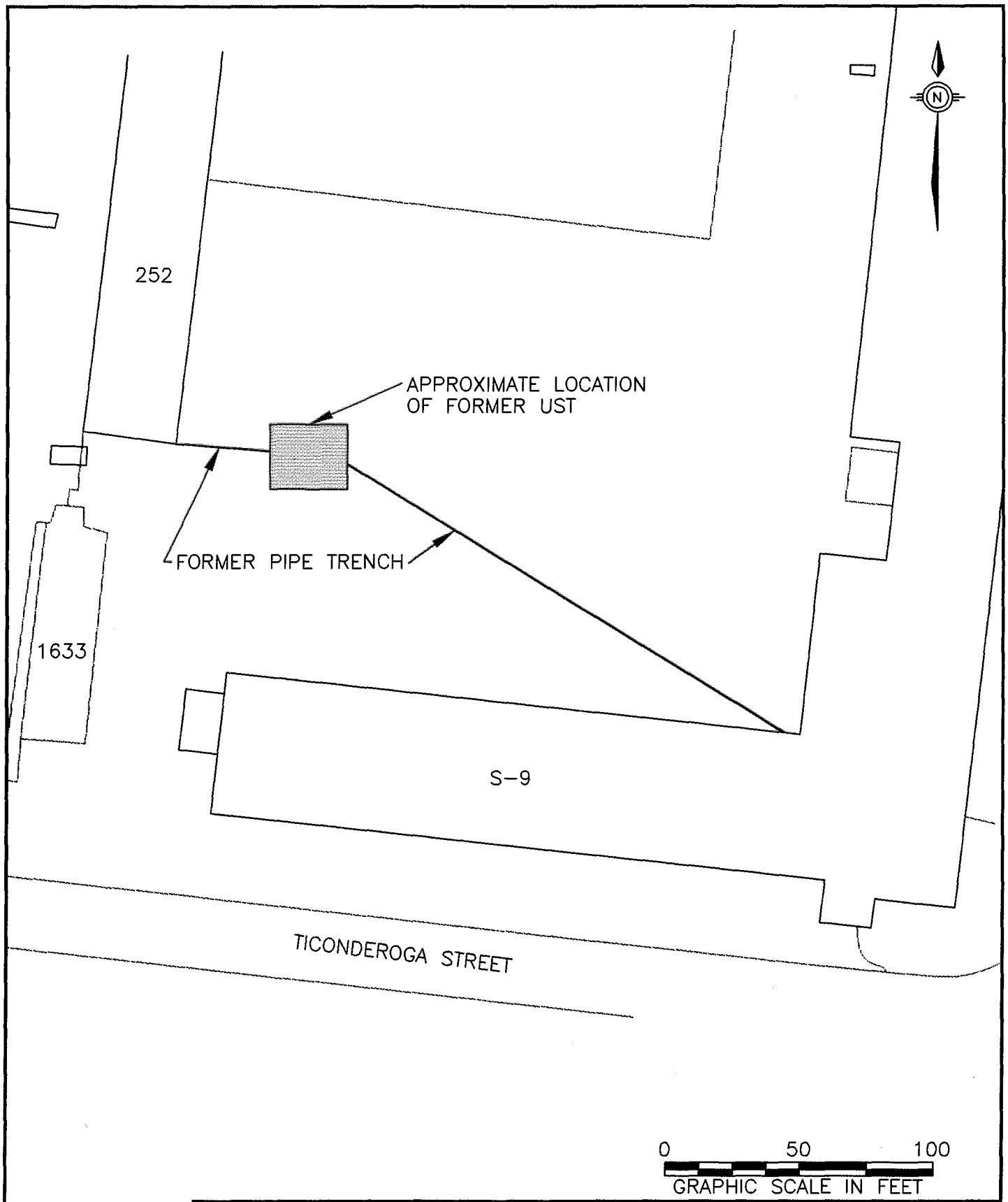

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FIGURE 1.2
SWMU 17
SITE MAP

DWG DATE: 01/25/00 | DWG NAME: 0140R004

The immediate area is covered by gravel or asphalt and descends slightly to the south and west toward SWMU 38.

1.1.2 SWMU 19

SWMU 19, the former location of UST 1648, is approximately 150 feet north of Navy Road (Figure 1.3). SWMU 19 is bounded to the north by a wooded area and Assembly G SWMU 49 (a former hazardous-waste accumulation point for Building N-757) and to the south by Navy Road and Building 341 of the Navy Exchange Service Station. This SWMU is bordered to the east by Building 757 and to the northwest by the former Aircraft Fire Fighting Training Facility (SWMU 5).

SWMU 19 is reported to have operated as a UST from 1983 through 1992. Data collected during the removal of UST 1648 indicate that a release may have occurred before its removal.

The immediate area, which is asphalt, descends slightly west and northwest toward two storm drains and a wooded area to the north. Both storm drains discharge into a ditch that drains SWMU 5 and leads into a tributary of North Fork Creek.

1.1.3 SWMU 20

SWMU 20 (abandoned UWT 1594), is approximately 200 feet west of Hornet Avenue and Commitment Loop on the NSA Mid-South Southside, southeast of Building 1594 (see Figure 1.4). UWT 1594 is reported to have stored waste oil and waste hydraulic fluid generated by the Air Traffic Control School. The estimated tank size was 100 gallons. The tank's installation date is unknown; it was removed in May 1992. The information obtained for SWMU 20 during the 1990 RFA is in Attachment 1 of the Assembly F CSI work plan.

The immediate area is covered by asphalt, while surrounding areas have grass cover. The surface drains toward the south and west to SWMU 38. As part of the base realignment, Building 1594 was demolished and the SWMU 20 area was repaved to provide parking for Building S-769. Because the area was originally paved and used as a storage area, it was not necessary to change the grade for the parking lot construction, so drainage has been changed little, if any.

1.1.4 SWMU 22

SWMU 22 consists of four USTs west of Building S-75, the boiler plant, which were installed in approximately 1944 (Figure 1.5). According to NSA Mid-South personnel in the Public Works Office, Environmental Division, the tanks were removed but the removal date is unknown. Tanks 1244, 1245, and 1246 stored fuel oil for the boiler plant and an unnumbered tank stored diesel fuel. USTs 1245 and 1246 each held 25,000 gallons, UST 1244 held 50,000 gallons, and the diesel UST held 280 gallons. The three large USTs were constructed of concrete with steel piping, while the diesel UST and piping were steel.

The SWMU areas are covered by gravel, concrete, or asphalt and surrounding areas have grass cover. Surface drainage is to the west to SWMU 38. Section 2.2 of the Assembly F CSI work plan contains site-specific geologic and hydrogeologic information and references. Because soil and groundwater samples were collected by "blind" pushing of direct-push technology (DPT) tools to a predetermined depth without lithologic characterization, no additional site-specific information is available.

1.1.5 SWMU 39

SWMU 39 is approximately 300 feet south of Kearsarge Avenue and Intrepid Street across from the boiler plant on the NSA Mid-South Southside (Figure 1.6). SWMU 39 consists of the area surrounding the concrete slab remaining from Building S-74. Transformers and drums of oil were stored in the PCB storage area (an outdoor concrete slab) until Building S-74 was demolished in 1995.

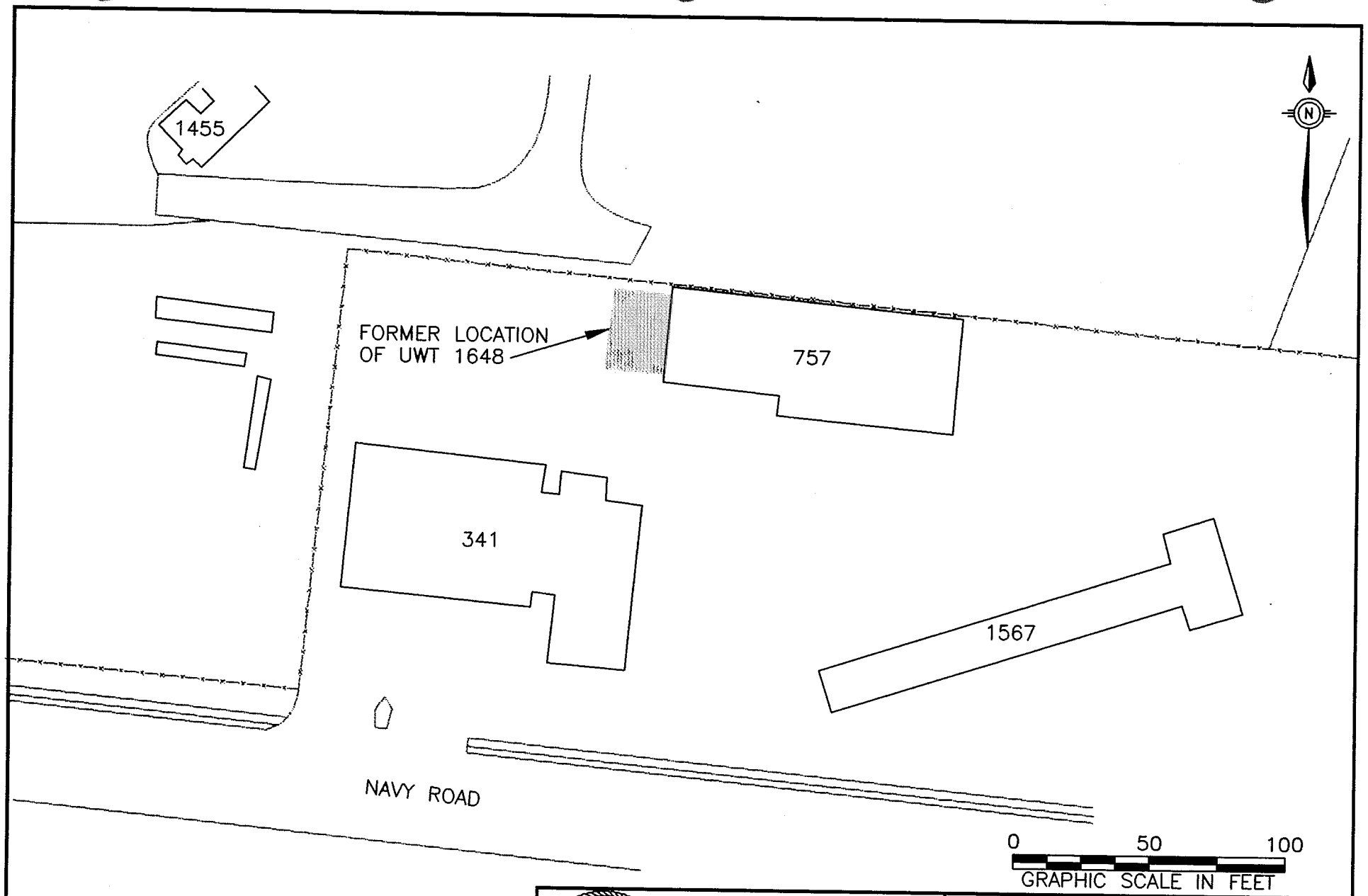

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FIGURE 1.3
SWMU 19
SITE MAP

DWG DATE: 01/05/00 | DWG NAME: 0140R005

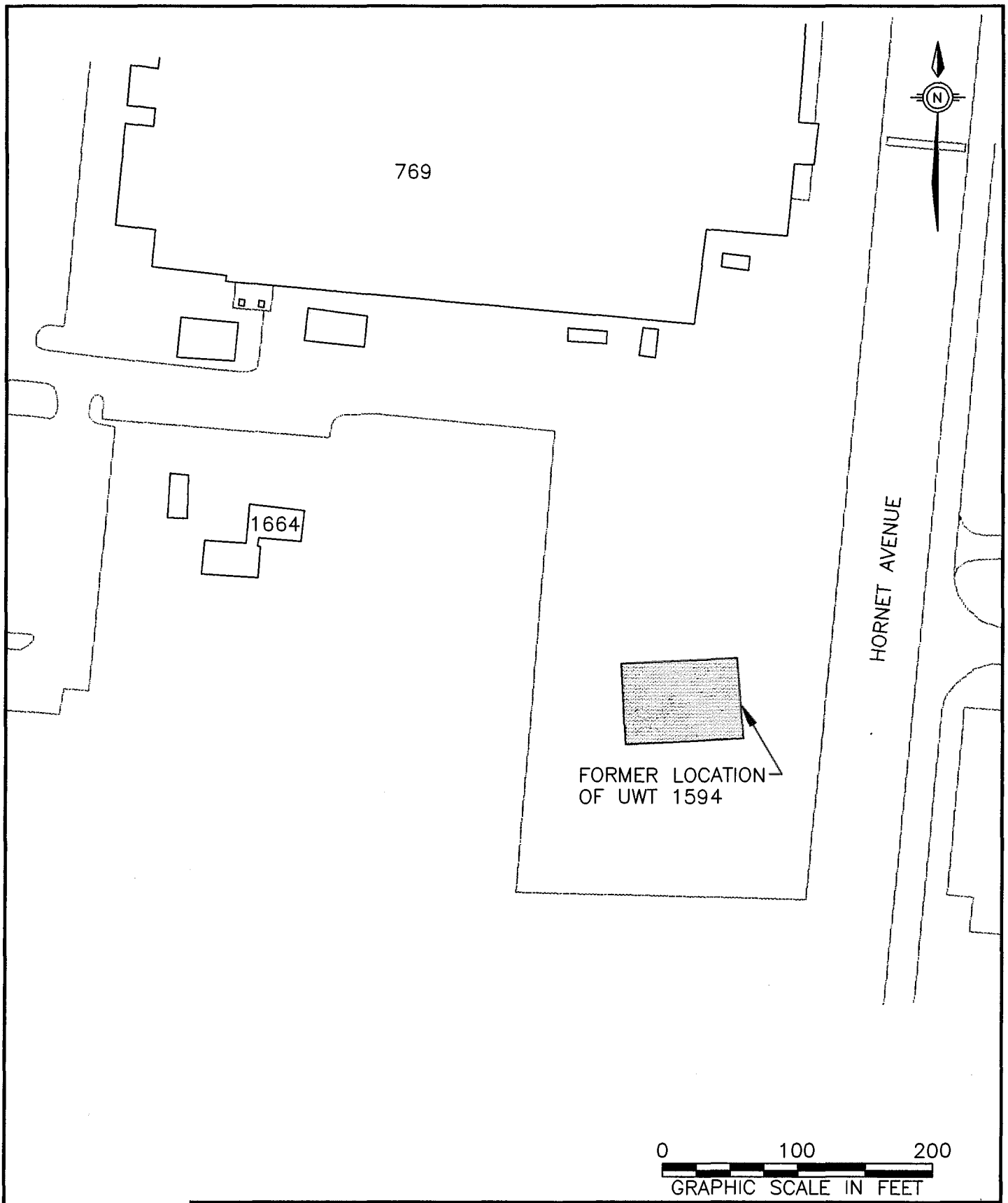

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FIGURE 1.4
SWMU 20
SITE MAP

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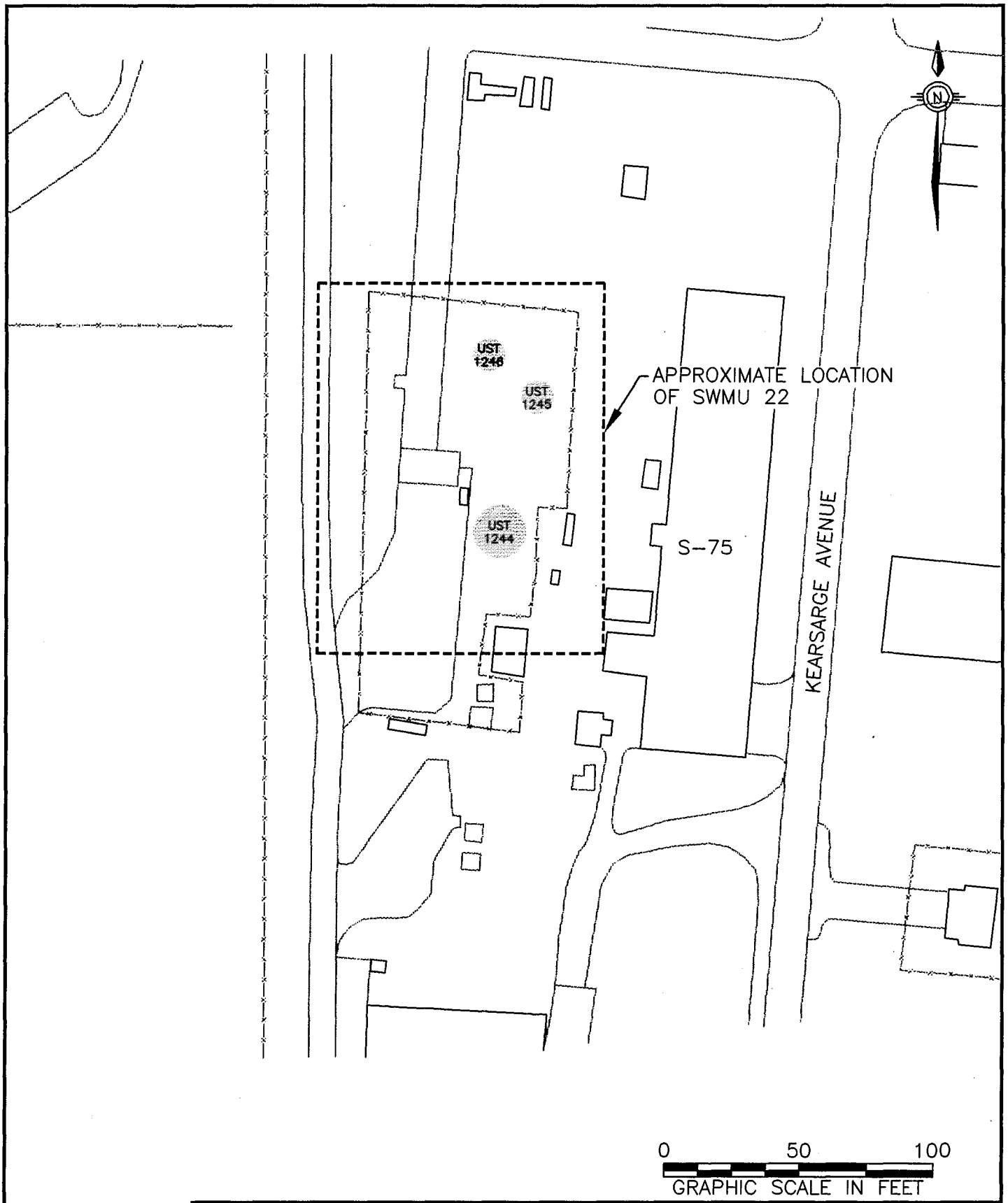

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FIGURE 1.5
SWMU 22
SITE MAP

DWG DATE: 01/25/00 | DWG NAME: 0140R007

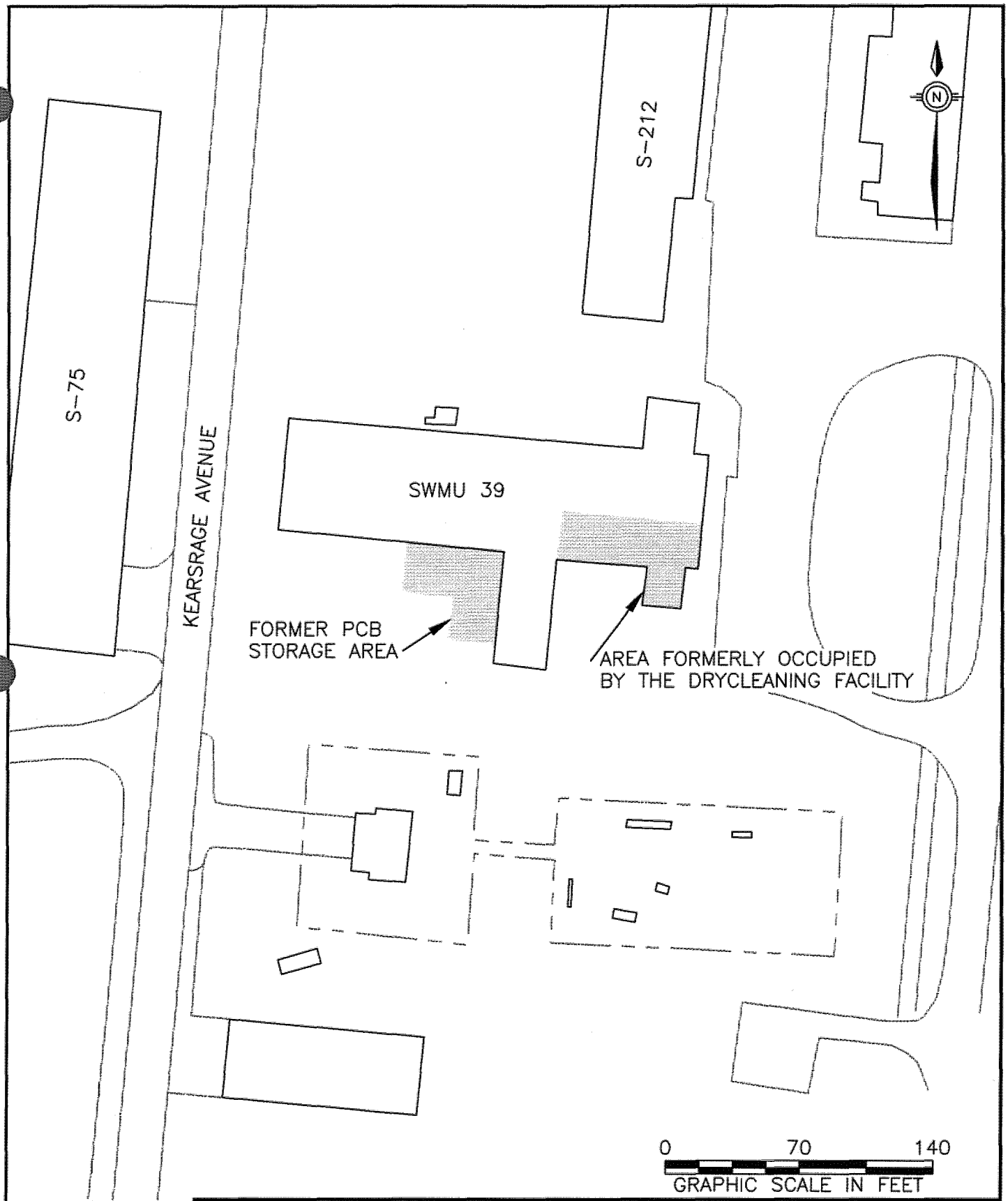

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FIGURE 1.6
SWMU 39
SITE MAP

DWG DATE: 01/25/00 | DWG NAME: 0140R008

Building S-74 was built in 1943 and operated as a laundry until 1981 (38 years). Building S-212, which also occupied the area, was constructed in 1947 to store solvent for S -74. The remaining building foundation is concrete, while surrounding areas are covered with grass. Surface drainage is toward the south and west to SWMU 38.

The SWMU 39 investigation area also includes SWMUs 22 and 63. Because SWMU 22 is hydraulically downgradient of and adjacent to SWMU 39, and similar compounds were detected at both sites during the CSI, both SWMUs were investigated as one site. SWMU 63 is in the SWMU 39 investigation area. However, no contamination was identified in any CSI samples collected at this SWMU, so no samples were collected during the RFI.

1.1.6 SWMU 63

SWMU 63 consists of an approximately 7-foot by 7.5-foot area adjacent to the southwest corner of Building S-75 (Figure 1.7), the former location of a 65-gallon, stainless-steel UWT. When the UWT was removed in April 1992, no soil contamination was evident.

The SWMU areas are covered by gravel, concrete or asphalt and surrounding areas have grass cover. Surface drainage is toward the west to SWMU 38.

Because soil and groundwater samples were collected by "blind" pushing of DPT tools to a predetermined depth without lithologic characterization, no additional site-specific information is available.

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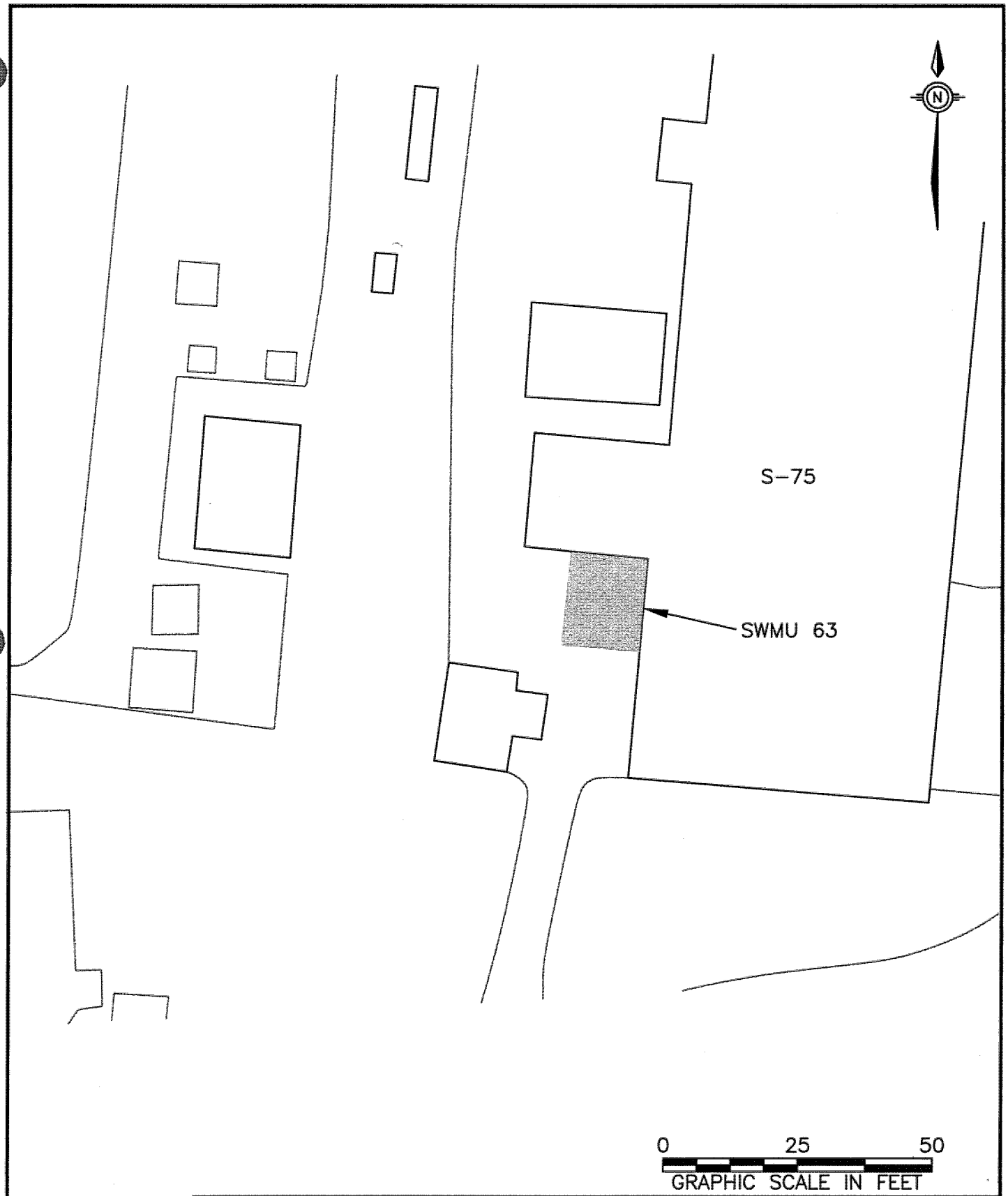

ASSEMBLY F
RFI REPORT
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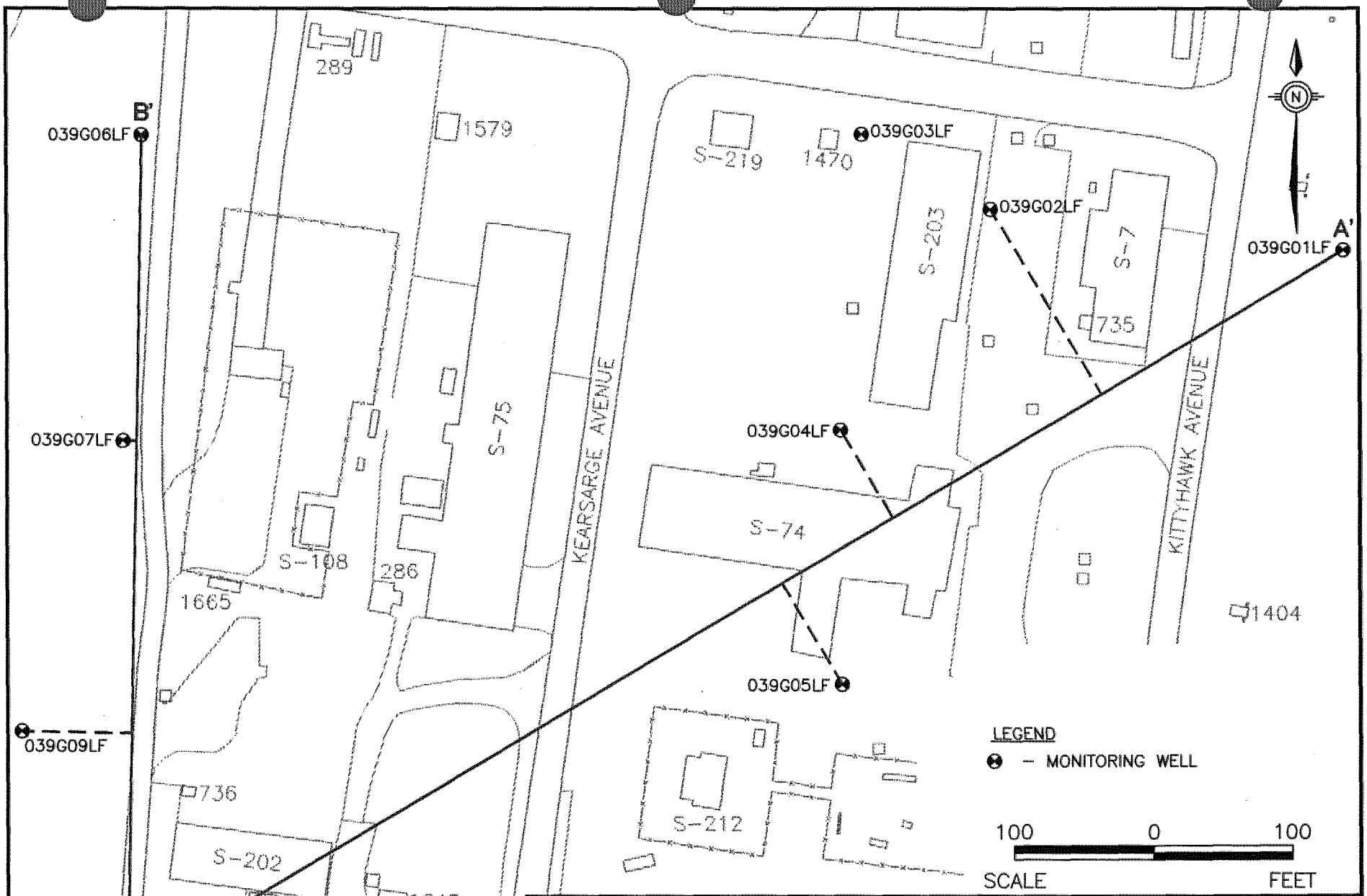
MILLINGTON, TENNESSEE

FIGURE 1.7
SWMU 63
SITE MAP

DWG DATE: 01/18/00 | DWG NAME: 0140R009



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RFI REPORT
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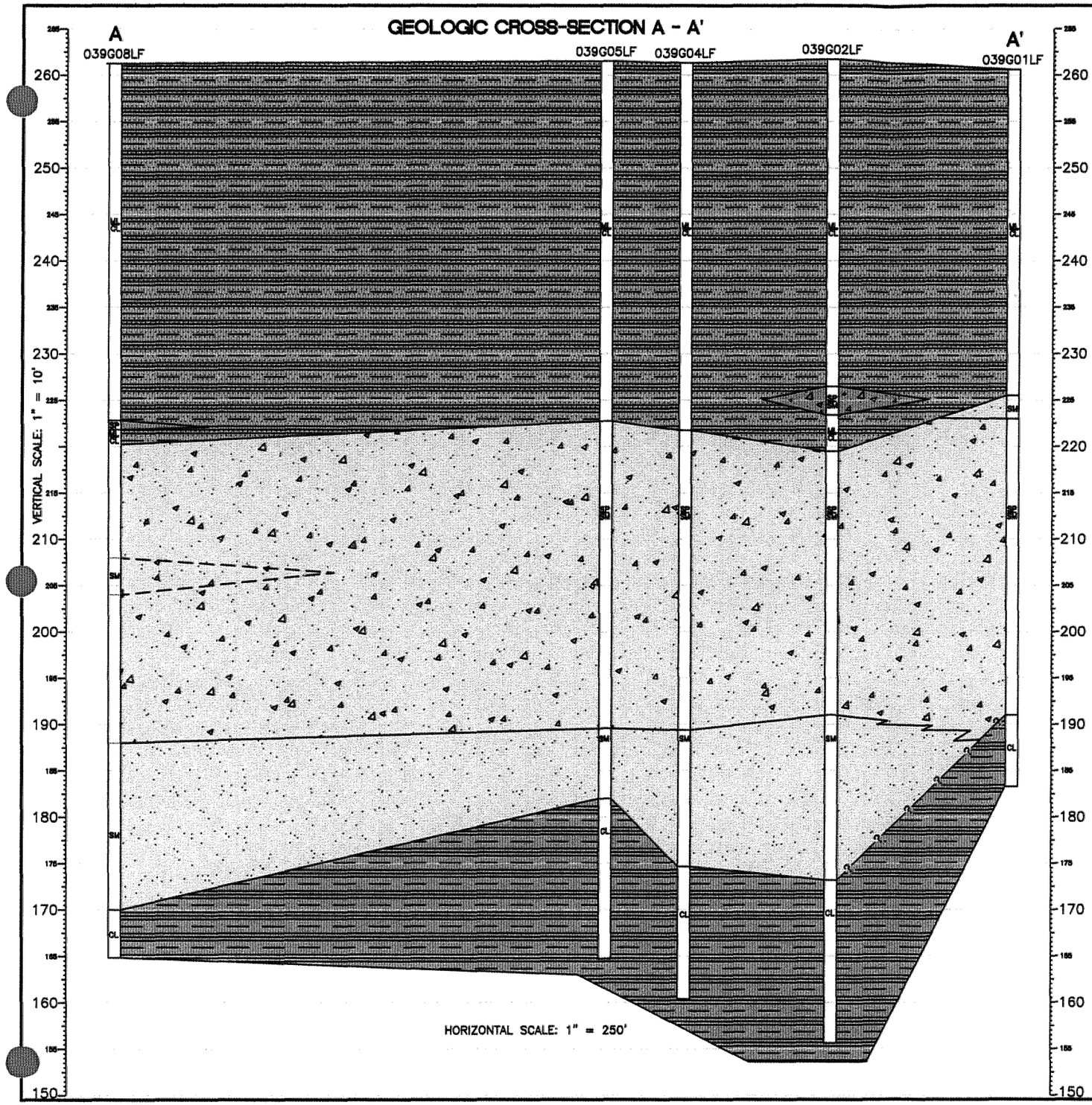
MILLINGTON, TN

FIGURE 2.1
SWMUs 39
CROSS SECTION
REFERENCE MAP

DWG DATE: 01/14/00 | DWG NAME: 0106N012



LEGEND

- ML/CL — SILTY CLAY, LIGHT BROWN
- SP — FINE GRAINED SAND, POORLY GRADED, LIGHT GRAY
- SP/SM — SAND POORLY GRADED WITH GRAVEL, GRAY
- SM — SILTY SAND, FINE GRAINED
- CL — CLAY, STIFF DARK GRAY

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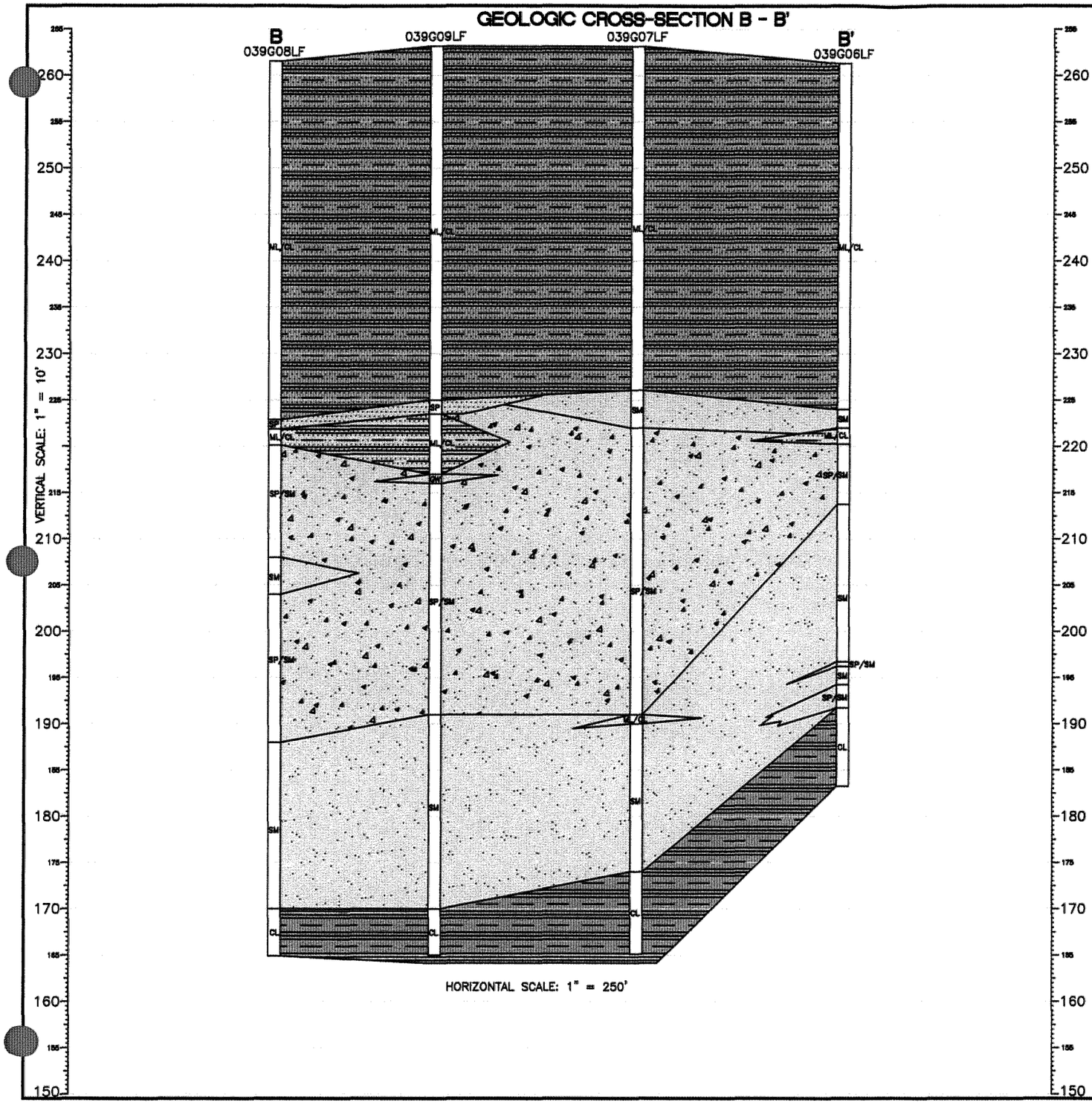
FIGURE 2.2
SWMU 39
CROSS SECTION A – A'

DWG DATE: 01/14/00 | DWG NAME: 0141R001



LEGEND

- ML/CL — SILTY CLAY, LIGHT BROWN
- SP — FINE GRAINED SAND, POORLY GRADED, LIGHT GRAY
- SP/SM — SAND POORLY GRADED WITH GRAVEL, GRAY
- SM — SILTY SAND, FINE GRAINED
- CL — CLAY, STIFF DARK GRAY

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FIGURE 2.3
SWMU 39
CROSS SECTION B – B'

DWG DATE: 01/14/99 | DWG NAME: 0141R002

SWMUs 20 and 39 — the loess deposits, fluvial deposits, and the Cockfield Formation. They are described in the following paragraphs.

The loess consists of a silty clay, with varying amounts of silt and clay and occasional sand. It behaves as an overlying semiconfining unit to the fluvial deposits. Thickness of the loess ranged from approximately 32 to 46 feet. Color ranged from varying shades of brown, orange-brown and gray-brown to gray. Some gray mottling and iron staining were observed. While rotosonic drilling's use of water made it difficult to identify groundwater, saturated zones in the loess are typically encountered near its basal section.

The fluvial deposits were encountered beneath the loess at depths from 32 to 46 feet, with an overall thickness ranging from 33 to 68 feet. The entire thickness is saturated. Two distinct facies were observed. The upper fluvial deposits is a fine to coarse-grained, poorly sorted sand and gravel ranging from 11 to 43 feet thick. The rounded to sub-angular gravel coarsens downward and typically ranges from less than 0.25 to 1 inch in diameter. It was occasionally encountered as large as 2 to 2.5 inches in diameter. Color ranged from varying shades of orange-brown and gray to olive gray.

The lower fluvial deposits is very fine to fine grained sand ranging from 13 to 29 feet thick. The color ranged from very light gray to light yellow-gray. These facies are shown on the cross-sections for SWMU 39.

The contact between the fluvial deposits and the Cockfield Formation ranged from 70 to 102 feet below land surface (bls). This formation behaves as a lower semiconfining unit for the fluvial deposits. The contact was noted by a distinct change from the fine sands of the lower fluvial deposits to the dense, stiff clay of the Cockfield. During the investigation, the Cockfield Formation was never penetrated more than 7 or 8 feet. This formation's upper portion

consists of a dark charcoal gray or dark olive-gray clay, which is dense and very stiff. Fine sand was noted at some locations.

Three Shelby tube samples were collected during the investigation; one was collected at SWMU 17 from the loess at a depth interval of 10 to 12 feet bls and one each was collected at SWMUs 20 and 39, both from the loess deposits at a depth interval of 33 to 35 feet bls. Each tube was submitted for geotechnical analysis. Each sample's coefficient of permeability is listed in Table 2.1.

Table 2.1
Soil Permeabilities

SWMU	Sample ID	Coefficient of Permeability (cm/sec)
17	017G000312	3.6×10^{-6}
19	019G000312	4.7×10^{-6}
20	039S05LF33	4.5×10^{-6}
39	020S01LF33	1.3×10^{-5}
Average Permeability		6.45×10^{-6}

The laboratory forms for the sample's geotechnical analysis are included as Appendix B.

2.1.3 Site-Specific Hydrogeology

This section discusses the hydrogeology for Assembly F SWMU 20 and the SWMU 39 area. Historical hydrogeologic information was obtained from Section 2.12 of the Comprehensive RFI Work Plan. Recent data were obtained from the piezometers and monitoring wells installed in the fluvial deposits at SWMUs 20 and 39.

The two water-bearing units sampled during the RFI are the loess and fluvial deposits. Groundwater flow in the loess is primarily downward, although locally, some loess groundwater may discharge to nearby streams, drainage ditches, and other surface water bodies.

Groundwater elevations measured in the three piezometers at SWMUs 20 in July 1998 indicate groundwater flow to the west. The horizontal hydraulic gradient at the site was calculated to be 0.005. The groundwater flow direction and elevations are presented on the SWMU 20 potentiometric surface map (Figure 2.4).

During the RFI, nine fully penetrating monitoring wells were installed in SWMU 39. Groundwater elevations were measured in these wells in April and May of 1999 to determine flow directions and horizontal gradients in the fluvial deposits at SWMU 39. Potentiometric maps generated with this data (Figures 2.5 and 2.6) indicate a southwest groundwater flow direction for each month. The horizontal hydraulic gradient for groundwater in the fluvial deposits was 0.0028 in April and 0.0029 in May.

On December 15, 1999, specific capacity tests were performed on monitoring wells 039G02LF, 039G03LF, and 039G08LF to provide first estimates of hydraulic conductivity. Field measurements of yield, time, and drawdown were collected during the specific capacity testing. These values were then used as input values in a commercially available software, Q/s (Kasenow and Pare,1995), designed to calculate transmissivity using specific capacity test results. The reader is referred to that reference, or to the Southern Division Monitoring Well Design, Installation, Construction, and Development Guidelines (1997) for details regarding the theoretical considerations of these calculations.

Table 2.2 presents the results of the specific capacity testing and the software analysis of the data. Given that these wells were fully penetrating, K's were calculated from the resulting transmissivities by dividing by the aquifer thickness. A K value is provided for each well; since hydrologic data is typically log-normally distributed, a geometric mean K was calculated as a value representative of the central tendency. This value was then applied to the calculation of the average horizontal groundwater velocity.

Table 2.2
Specific Capacity Test Results

Monitoring Well	Lithologic Unit	Specific Capacity (gpm/ft)	Transmissivity T (ft^2/day)	Aquifer Thickness (ft)	K (ft/day)
039G02LF	Entire Fluvial Deposits	0.6	156	64	2.4
039G03LF	Entire Fluvial Deposits	2.4	555	68	8.2
039G08LF	Entire Fluvial Deposits	3.5	848	53	16.0
	Geometric Mean Average				*6.8*

Notes:
gpm/ft — gallons per minute per foot
ft^2/day — square feet per day
ft/day — feet per day

The calculated average horizontal velocity of the groundwater was determined using the following equation (a derivation of the basic Darcy equation):

$$v = \frac{K \times I}{n}$$

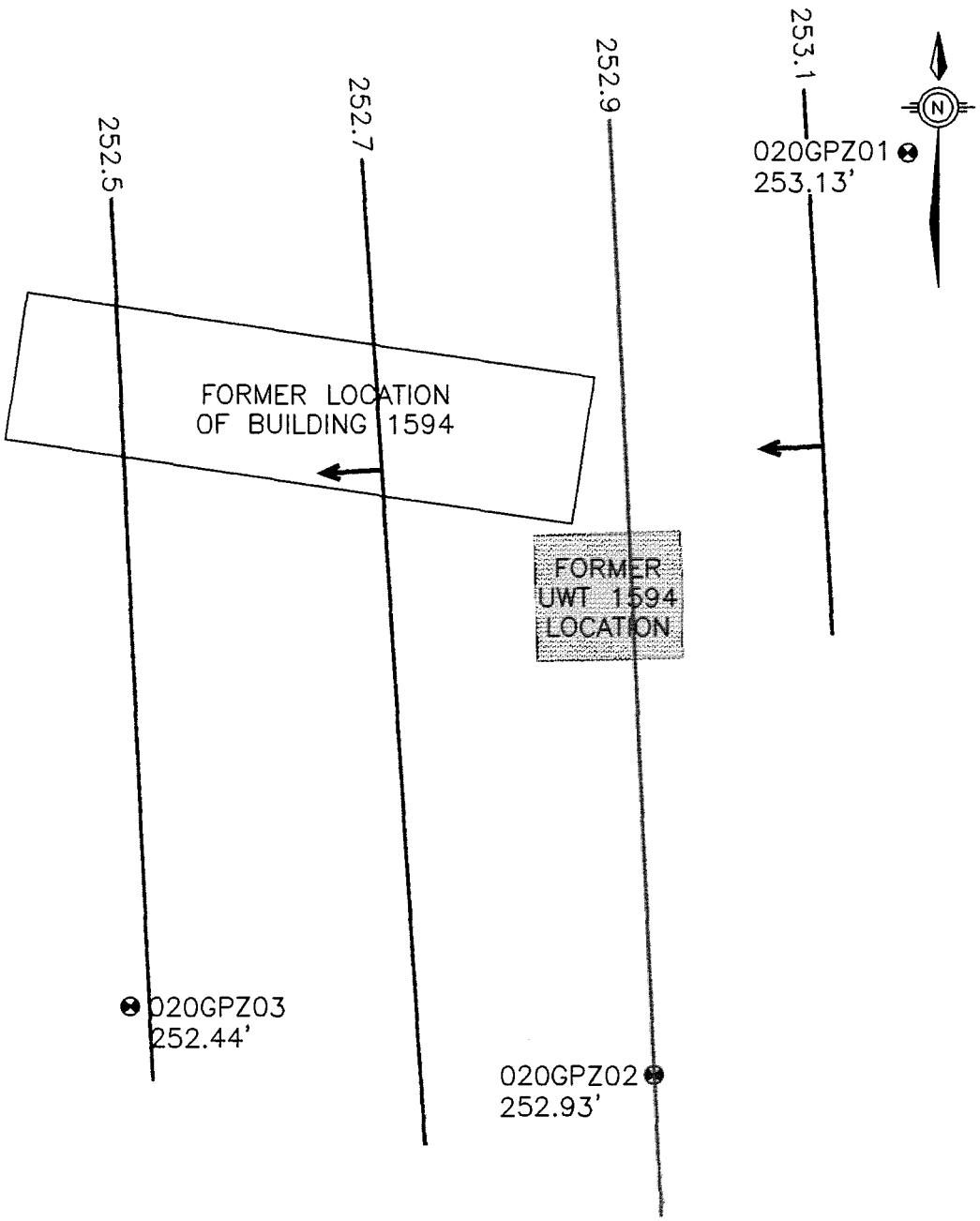
where:

v = calculated average horizontal velocity (ft/day)

K = geometric average hydraulic conductivity (ft/day)

I = average hydraulic gradient (ft/ft)

n = effective porosity



LEGEND

→ – APPROXIMATE GROUNDWATER FLOW DIRECTION IN FLUVIAL DEPOSITS

—252— – POTENTIOMETRIC SURFACE CONTOUR AND ELEVATION

⊗ – MONITORING WELL

0 20 40

GRAPHIC SCALE IN FEET

NOTE
THE ENTIRE SITE IS PAVED WITH ASPHALT.

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FIGURE 2.4
SWMU 20
POTENTIOMETRIC SURFACE MAP
JULY 1998

DWG DATE: 01/28/00 | DWG NAME: 0140R012

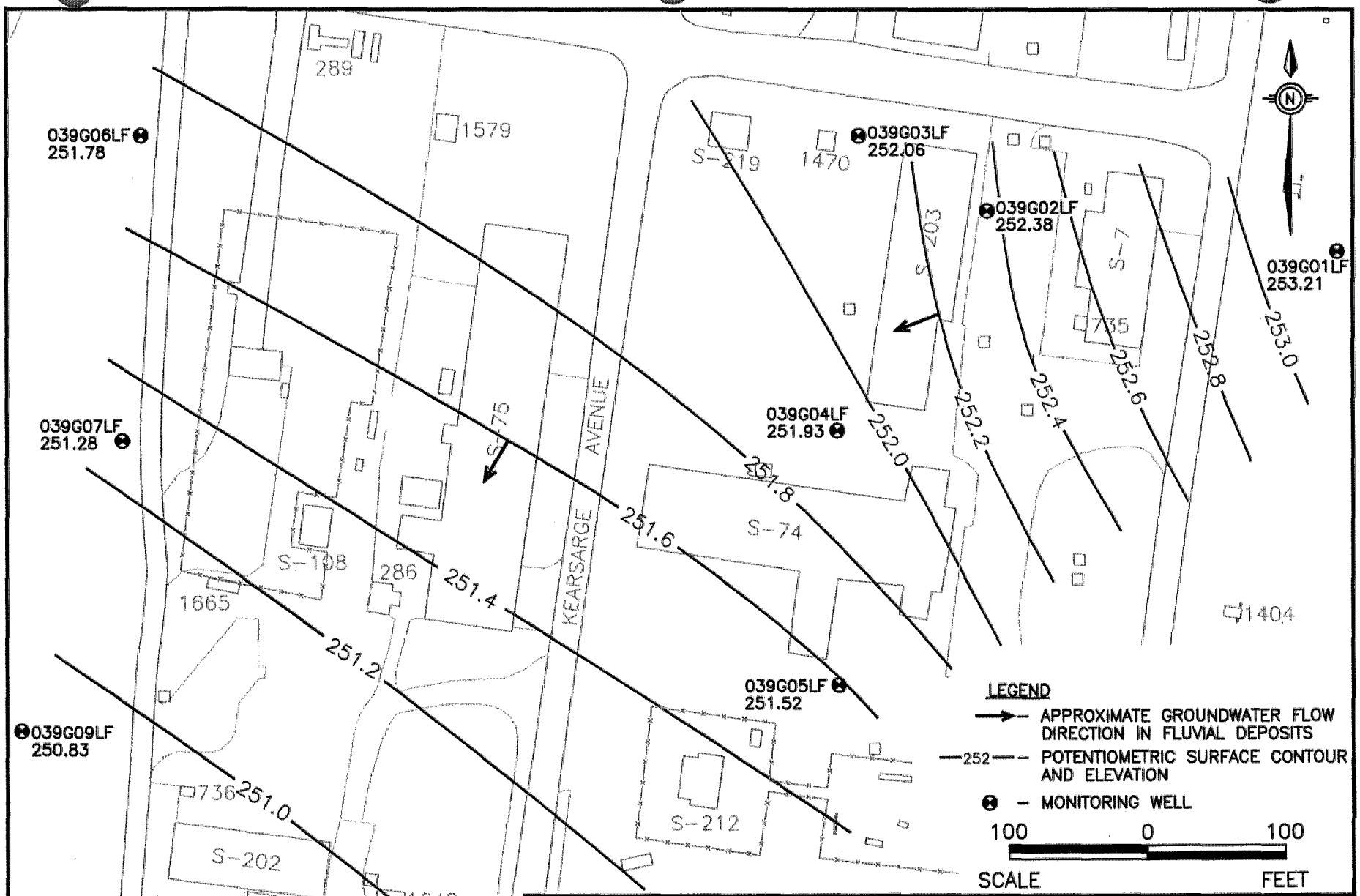

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FIGURE 2.5
SWMU 39
POTENTIOMETRIC SURFACE MAP
APRIL 1999

DWG DATE: 01/28/00 | DWG NAME: 0106N010

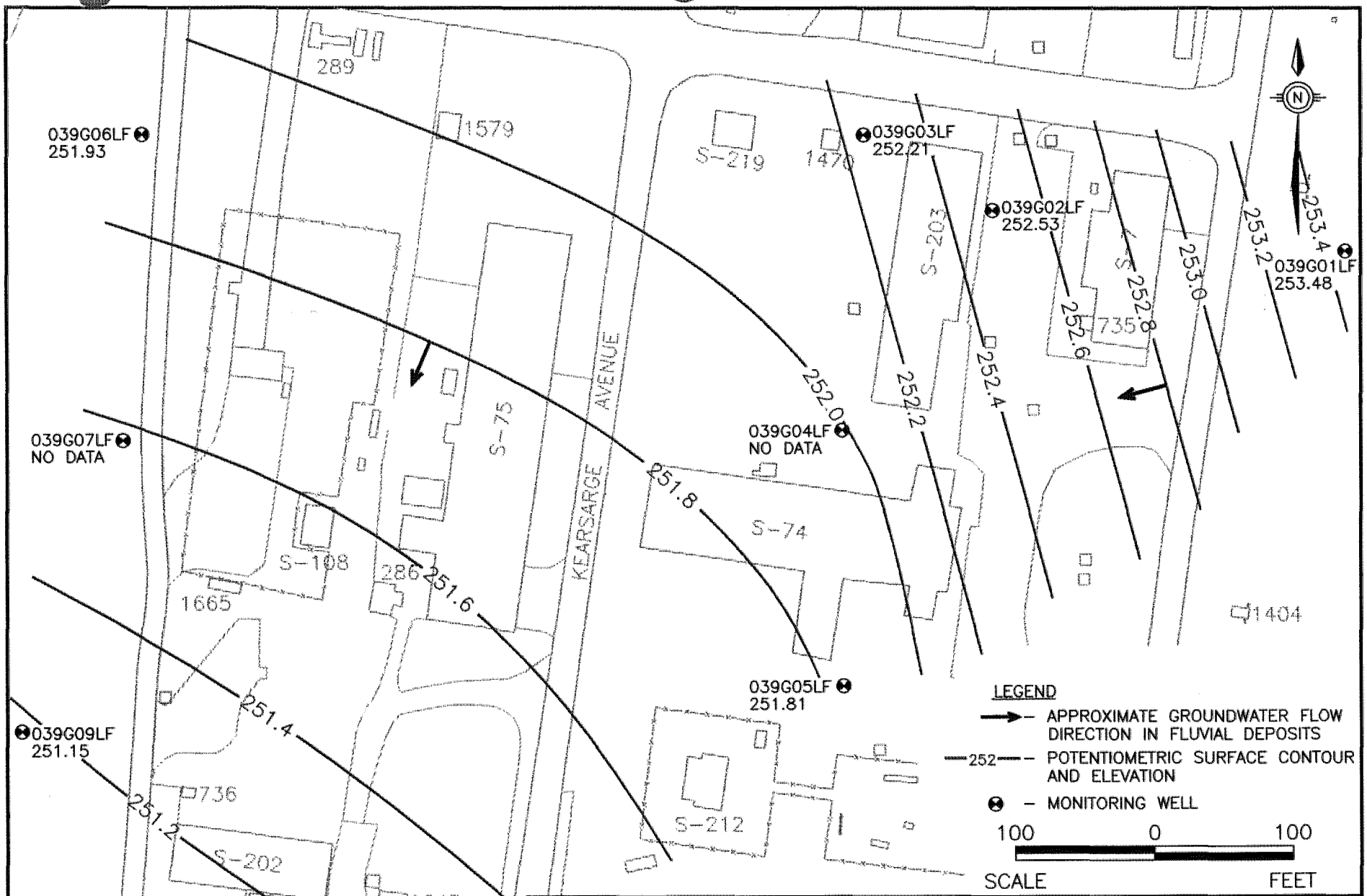

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FIGURE 2.6
SWMUs 39
POTENTIOMETRIC SURFACE MAP
MAY 1999

DWG DATE: 01/28/00 | DWG NAME: 0106N011

The hydraulic conductivity used for this calculation was 6.8 ft/day. The effective porosity used was 0.25, a value typical for silty sand (Freeze and Cherry, 1979). Based upon potentmetric maps for SWMU 39 and 20, an average hydraulic gradient of 0.0036 ft/ft was used. Using the equation above, the calculated average horizontal groundwater velocity is 0.10 ft/day (36.5 ft/yr).

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3.0 PREVIOUS INVESTIGATIONS

This section discusses all investigations conducted at each SWMU prior to the RFI. The previous investigations and their findings are discussed chronologically.

3.1 SWMU 17

3.1.1 SWMU 17 Tank Removal

Underground Waste Tank (UWT) S-9 was removed in 1996 by Koester Environmental Services, Inc. Soil samples collected and analyzed for total petroleum hydrocarbons (TPH) during the removal indicated a prior release. The soil sampling results were compared to the most conservative Tennessee Department of Environment and Conservation (TDEC) cleanup level for TPH in soil of 100 milligrams per kilogram (mg/kg). This comparison indicated that both tank pit samples and 10 of the 11 samples from the pipe trench exceeded the TDEC cleanup level. As presented in the *Underground Storage Tank Closure Report for UST S-9* (Koester Environmental Services, November 1996), a sludge sample was collected from tank S-9 prior to its removal and analyzed for TLCP RCRA Metals and TCLP Benzene. The results, in micrograms per liter, were as follows:

Arsenic	7
Barium	500
Cadmium	88
Chromium	290
Lead	BDL
Mercury	BDL
Selenium	BDL
Silver	BDL
TCLP Benzene	37.6

Note:
BDL — below detection limit

Evidence of a release was observed during the tank removal so additional investigation was warranted.

3.1.2 SWMU 17 CSI

The CSI, which was conducted in January 1998 to confirm the presence and define the extent of contamination identified during the tank removal, consisted of collecting soil samples around the former tank location. The CSI work plan called for soil sample collection from four locations. Groundwater samples were proposed for collection from the loess and fluvial deposits at five locations; however, the loess deposits did not produce enough groundwater for sample collection. To obtain chemical data for the loess, samples of the saturated soil were collected instead. Because a release was confirmed, the BRAC Cleanup Team (BCT) decided that an RFI should be conducted to determine the nature and extent of the contamination detected.

3.2 SWMU 19

Previous sampling at SWMU 19 was conducted during the removal of UWT 1648 and the subsequent CSI. A soil removal is currently proposed for this site.

3.2.1 SWMU 19 Tank Removal

UWT 1648 was removed on March 19, 1996. Visual inspection of the tank pit indicated that a release had occurred, so the tank pit was overexcavated to remove the contaminated soil. Soil samples were collected during the removal and screened with a photoionization detector (PID). After the contaminated soil had been removed, two confirmation soil samples were collected from the floor of the excavation based on PID screening. The confirmation samples were analyzed at an offsite laboratory for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), Appendix IX metals, pesticides and PCBs.

Because several petroleum-related organic compounds were detected in the confirmation samples, further investigation was warranted for SWMU 19.

3.2.2 SWMU 19 CSI

EnSafe conducted a CSI at SWMU 19 in January 1998 to better define the vertical and horizontal extent of the soil contamination identified in the confirmation samples collected during the tank removal and to assess the potential for groundwater contamination associated with the UWT operations. Seven locations were sampled using direct-push-technology. Subsurface soil samples were collected at four locations and fluvial deposits groundwater samples were collected at three. CSI soil samples were analyzed for VOCs, SVOCs, chlorinated pesticides, PCBs, Appendix IX metals, and TPH. Groundwater samples were analyzed for VOCs.

Volatile and semivolatile organics, pesticides, TPH, and Appendix IX metals were identified in subsurface soil samples collected at SWMU 19. VOCs were also identified in fluvial deposits groundwater samples. These detections were compared to all appropriate regulatory standards. TPH exceeded the site-specific clean up level of 500 mg/kg in two soil sampling locations. Based on the findings of the CSI, the BCT recommended removal of the tank and further delineation of the extent of the TPH identified at the site.

3.2.3 SWMU 19 Removal Action

In July 1998, EnSafe submitted a *Voluntary Corrective Action Work Plan* (Revision 1, May 26, 1999) outlining the proposed SWMU 19 soil removal. The removal action is scheduled to take place in the spring of 2000.

3.3 SWMU 20

Previous investigations at SWMU 20 include a tank removal and a CSI.

3.3.1 SWMU 20 Tank Removal

Removal of UWT 1594 is documented in the *Underground Storage Tank Closure Report, Tank No. 1594* (National Salvage, 1992). When the UWT was removed, the excavated soil was stockpiled. Soil samples were collected from four corners of the open tank pit and from the stockpiled soil. The tank pit samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), total petroleum hydrocarbons-gasoline range organics (TPH-GRO), and TPH-diesel range organics (TPH-DRO). The stockpiled soil was analyzed for BTEX, TPH-GRO and TPH-DRO, toxicity characteristic leaching procedure (TCLP) lead, benzene, and TPH; and flash point. TPH-DRO concentrations in the tank pit samples ranged from 21.6 parts per million (ppm) to 3,072 ppm. The TPH-DRO concentration in the stockpiled soil was 20,288 ppm and the TCLP TPH-DRO was 1.89 ppm. Analysis of sample of the tanks contents identified the following compounds (in ppm):

1,1-Dichloroethane	3.2
1,1-Dichloroethene	2.9
1,1,1-Trichloroethane	75
Ethylbenzene	0.12
Toluene	1.1
Xylene	0.31

These results indicated that a release had occurred at SWMU 20 during the tank's operation. Based on these results, a CSI was proposed to better define the nature and extent of the soil contamination and to determine if groundwater had been impacted.

3.3.2 SWMU 20 CSI

The CSI at SWMU 20 was completed in the fall of 1997. Details of the investigation are documented in the *Confirmation Sampling Investigation Report, Assembly F — SWMUs 20, 22/63, 30, and 39, NSA Memphis — Millington, Tennessee, Revision 2*: (EnSafe, May 1999).

Samples collected during this CSI were analyzed for VOCs as an indicator parameter for petroleum-related compounds, and to determine whether chlorinated solvents are present from any release from the UWT. Two surface soil samples were also analyzed for full-scan analysis (FSA) to facilitate a preliminary risk evaluation (PRE) that would offer conservative risk estimates for the compounds identified.

The SWMU 20 PRE classified benzene, 1,1-dichloroethane and 1,1-dichloroethene, 1,2-dichloroethane, and 1,1,2-trichloroethane as chemicals of potential concern (COPCs) in fluvial deposits groundwater.

While dieldrin, methylene chloride, nickel, and 1,1-dichloroethene were detected in surface soil, none was identified as a COPC in site soil. TPH was also detected in site soils.

The PRE concluded that the cumulative risk threshold of 1E-4 was exceeded for carcinogens in groundwater. Also, the incremental lifetime excess cancer risk (ILCR) was estimated to be 2E-03 for the residential scenario and 4E-04 for the industrial scenario; both exceed the target ILCR of 1E-4. The hazard indices (HIs) for noncarcinogens were estimated to be 0.6 for the residential scenario and 0.2 for the industrial scenario. Both values are less than the target hazard quotient (HQ) of 1.0. The analytical results and the PRE warranted an RFI at the site.

3.4 SWMUs 22 and 63

Previous investigations at SWMUs 22 and 63 consist of tank removals and a CSI.

3.4.1 SWMU 22 Tank Removal

The UST associated with SWMU 22 was removed in April 1992. The diesel UST was also removed in April 1992. The removal dates for the other three USTs at the site are unknown. Data reported in the UST closure report indicated a potential release during operation of the diesel UST. Therefore, four confirmation soil samples were collected from the open tank pit and analyzed for TPH-GRO and DRO. A disposal sample from the stockpiled soil was analyzed for BTEX, THP-GRO and TPH-DRO, TCLP lead, benzene and flash point. Tank pit samples ranged from 3,692 ppm to 11,259 ppm. The results for the sample from the stockpiled soil indicated a TPH-DRO concentration of 755 ppm and a TCLP TPH-DRO of 0.697 ppm.

3.4.2 SWMU 63 Tank Removal

A 65-gallon underground tank at SWMU 63 was also removed in April 1992. No visible evidence of surface contamination was observed. The following were present in the tanks contents' samples at parts per million:

methyl ethyl ketone	22,000
acetone	16,000
ethylbenzene	20,000
toluene	91,000
xylenes	110,000

Soil samples were also collected from the tank pit and analyzed for BTEX, TCLP metals, and TCLP volatiles. Results for all soil samples were less than the parameters' detection limits.

3.4.3 SWMUs 22 and 63 CSI

The CSI at SWMU 22 was completed in the fall of 1997. Details of the investigation are documented in the *Confirmation Sampling Investigation Report, Assembly F — SWMUs 20, 22/63, 30, and 39, NSA Memphis — Millington, Tennessee, Revision 2*: (EnSafe, May 1999).

CSI samples were analyzed for VOCs to determine whether chlorinated solvents were present from any release. Two surface soil samples were also analyzed for FSA to facilitate a PRE.

The PRE conducted at SWMUs 22 and 63 classified benzo(a)pyrene, benzo(a)pyrene equivalents (BEQs), and arsenic as COPCs in soil. Ethylbenzene, methylene chloride, and m-xylene were classified as COPCs in fluvial deposits groundwater.

While arsenic, benzene, methylene chloride, and 1,1,2-trichloroethane were detected in soil and methylene chloride and m-xylene were also detected in groundwater, none was identified as a COPC at this SWMU. TPH, which was also detected in site soils, has three soil cleanup levels in Tennessee. The site-specific cleanup level was selected based on soil permeability. At the time of the CSI, no permeability data were available for SWMU 22. Samples for permeability analysis were collected during the RFI.

The PRE concluded that the cumulative risk threshold of 10E-4 was not exceeded for carcinogens and the HI was not exceeded for noncarcinogens. The ILCRs were estimated to be 6E-05 for the residential scenario and 8E-06 for industrial scenarios. The HIs for noncarcinogens were estimated to be 1.0 for the residential scenario and 0.05 for the industrial scenario. Although an HI equal to the target hazard quotient of 1.0 was estimated for the residential scenario, two of the COPCs (arsenic and BEQs) target different organs.

Because SWMU 22 is so close to SWMU 39, and because it is hydraulically downgradient from SWMU 39, it is thought that some of the contaminants detected in SWMU 22 groundwater may have migrated to the site from SWMU 39. As a result, no groundwater sampling was conducted in direct association with SWMU 22. The area around Buildings S-74 and S-75 was sampled as part of the SWMU 39 investigation. Additional soil samples were collected at SWMU 22 to determine if petroleum contamination was still in the soil after the tanks were removed.

3.5 SWMU 39

Previous investigations at SWMU 39 consist of a preliminary groundwater assessment, a UST removal and a CSI.

3.5.1 SWMU 39 Preliminary Groundwater Assessment

During the preliminary groundwater assessment in December 1995, one groundwater sample was collected from the fluvial deposits using DPT and analyzed for VOCs. The analytical results indicated the presence of petroleum-related compounds, presumed to be Stoddard solvent.

3.5.2 SWMU 39 UST Removal

Tank number S-212 was removed by the Corps of Engineers in May 1996. Obvious soil contamination from the UST was observed during the removal and confirmed by soil samples collected from the tank pit. Liquid and sludge samples collected from the tank identified the following compounds (in ppb):

Acetone	104
Ethylbenzene	8,740
TCE	10,400
Trichlorofluoromethane	12.4
Styrene	15.3
Xylene	187,000

3.5.3 SWMU 39 CSI

The CSI at SWMU 39 was completed in the fall of 1997. The investigation is documented in the *Confirmation Sampling Investigation Report, Assembly F — SWMUs 20, 22/63, 30, and 39, NSA Memphis — Millington, Tennessee, Revision 2*: (EnSafe, May 1999).

CSI samples were analyzed for VOCs as an indicator parameter for petroleum-related compounds, and to determine whether chlorinated solvents were present from any release from past operations. Two surface soil samples were also collected and analyzed for FSA to facilitate a PRE.

The PRE identified methylene chloride and trichloroethene as COPCs in fluvial deposits groundwater. Ethylbenzene and m-xylene were identified as COPCs in loess groundwater.

While dieldrin, technical chlordane, 1,1,2,2-tetrachloroethane, ethylbenzene, and methylene chloride were detected in soil, none was classified as a COPC. TPH, which was also detected in site soils, has three soil cleanup levels for in Tennessee. The site-specific cleanup level was selected based on soil permeability. At the time of the CSI, no permeability data were available for SWMU 39. Samples for permeability analysis were collected during the RFI.

The PRE concluded that the cumulative risk threshold of 10E-4 was not exceeded for carcinogens and the HI for noncarcinogens did not exceed the target HQ of 1.0. The ILCRs were estimated to be 6E-06 for the residential scenario and 1E-06 for industrial scenarios. The HIs for noncarcinogens were estimated to be 0.95 for residential and 0.2 for industrial scenarios. Based on the analytical and PRE results, the BCT recommended defining the nature and extent of the chlorinated solvents detected in groundwater.

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4.0 FIELD INVESTIGATIONS AND METHODOLOGY

The Assembly F RFI soil and groundwater sampling program was intended to define the nature and extent of contamination identified during the CSI conducted at SWMUs 17, 19, 20, 22, 39 and 63. Specific RFI objectives were to:

- Determine the nature and extent of surface and subsurface soil contamination identified during the CSI at each SWMU.
- Determine the groundwater flow direction in the fluvial deposits aquifer at SWMUs 20, 22, and 39.
- Determine the vertical and horizontal extent of groundwater contamination in fluvial deposits at SWMUs 20, 22, and 39.
- Characterize preferred contaminant migration pathways for contaminants in groundwater in the fluvial deposits at SWMUs 20, 22, and 39.
- Determine site-specific cleanup levels for TPH contamination by collecting samples for permeability analysis at SWMUs 20, 22, and 39.
- Conduct an Ecological Risk Assessment at SWMUs 20, 22, and 39.
- Conduct a Human Health Risk Assessment at SWMUs 17, 19, 20, 22, 39 and 63.

The RFI was conducted in two phases. The first phase consisted of a DPT groundwater investigation to delineate the contaminants identified during the Assembly F CSI, to determine the groundwater flow direction, and to optimize well placement. The second phase consisted of

installing and sampling groundwater monitoring wells. This section summarizes the field sampling protocols used during both investigatory phases, which were based on USEPA and TDEC-approved *Comprehensive RFI Work Plan* (E/A&H, 1994) and the *RCRA Facility Investigation Work Plan — Assembly F SWMUs 20, 22 and 39* (EnSafe, 1998). The soil and groundwater sampling procedures followed the procedures outlined in the work plans. The analytical methods that were followed are presented in Section 4.1 of this RFI report. Section 4.2 presents the methodology, rationale, and sampling protocols used for the DPT subsurface soil and groundwater investigation. Section 4.3 presents the methodology, rationale and sampling protocols used.

4.1 Analytical Methods

Groundwater screening samples were submitted to both onsite and offsite laboratories for VOC analysis using USEPA Method 8260. Some soil samples were screened onsite for TPH using an infrared (IR) TPH analyzer. Soil and groundwater samples were submitted to an offsite laboratory for a full-scan analysis using the following methods:

- VOCs, USEPA Method 8260 (water)
- VOCs, USEPA Method 5035 (soil)
- SVOCs, USEPA Method 8270 (soil)
- TPH, USEPA Method 418.1 (soil)
- TPH-Gasoline Range Organics, TN Modified Method 8015/GRO (soil)
- TPH-Diesel Range Organics, TN Modified Method 8015/DRO (soil)
- Chlorinated pesticides/PCBs, USEPA Method 8080 (soil)
- RCRA Part 264, Appendix IX Total Metals, USEPA Method 6010/7000 series (soil)

Soil and groundwater samples were collected during the DPT phase of the investigation to determine the nature and extent of petroleum or solvent-related contaminants at the Assembly F

SWMUs. These samples were analyzed at either an onsite mobile laboratory (Pace, Inc.) or at Environmental Testing and Consulting of Memphis, Tennessee. Both were able to provide sample results the day after collection. These samples offered screening level data under Level II-equivalent data quality objectives (DQOs).

Groundwater samples collected from the monitoring wells were analyzed at Laucks Laboratories in Seattle, Washington, using Level IV DQO equivalents.

Table 4.1 summarizes the SW-846 analytical methods used during the DPT investigation and RFI.

Table 4.1
Analytical Parameters and Methods

SWMU	Sample Matrix/Interval	Number of Samples	Parameters	Laboratory
SWMU 17*	Soil (12-15')	4	VOCs, SVOCs, Pest/PCBs, TPH, Appendix IX Metals	Offsite
	Soil	39	TPH	Onsite Field IR
	Groundwater (loess)	5	VOCs	Offsite
	Groundwater (fluvial)	5	VOCs	Offsite
SWMU 19*	Soil (12-15')	4	VOCs, SVOCs, Pest/PCBs, TPH, Appendix IX Metals	Offsite
	Groundwater (fluvial)	3	VOCs	Offsite
SWMU 20	Soil	4	VOCs	Offsite
	Groundwater	16	VOCs	Onsite and offsite
SWMU 39	Soil	7	VOCs	Offsite
	Groundwater	201	VOCs	Onsite and offsite

Note:
* — CSI data used to complete the RFI.

Additional soils samples were collected using Shelby tubes. One sample was collected at each SWMU for soil permeability analysis. The permeability data were used to determine the appropriate soil cleanup concentrations for TPH.

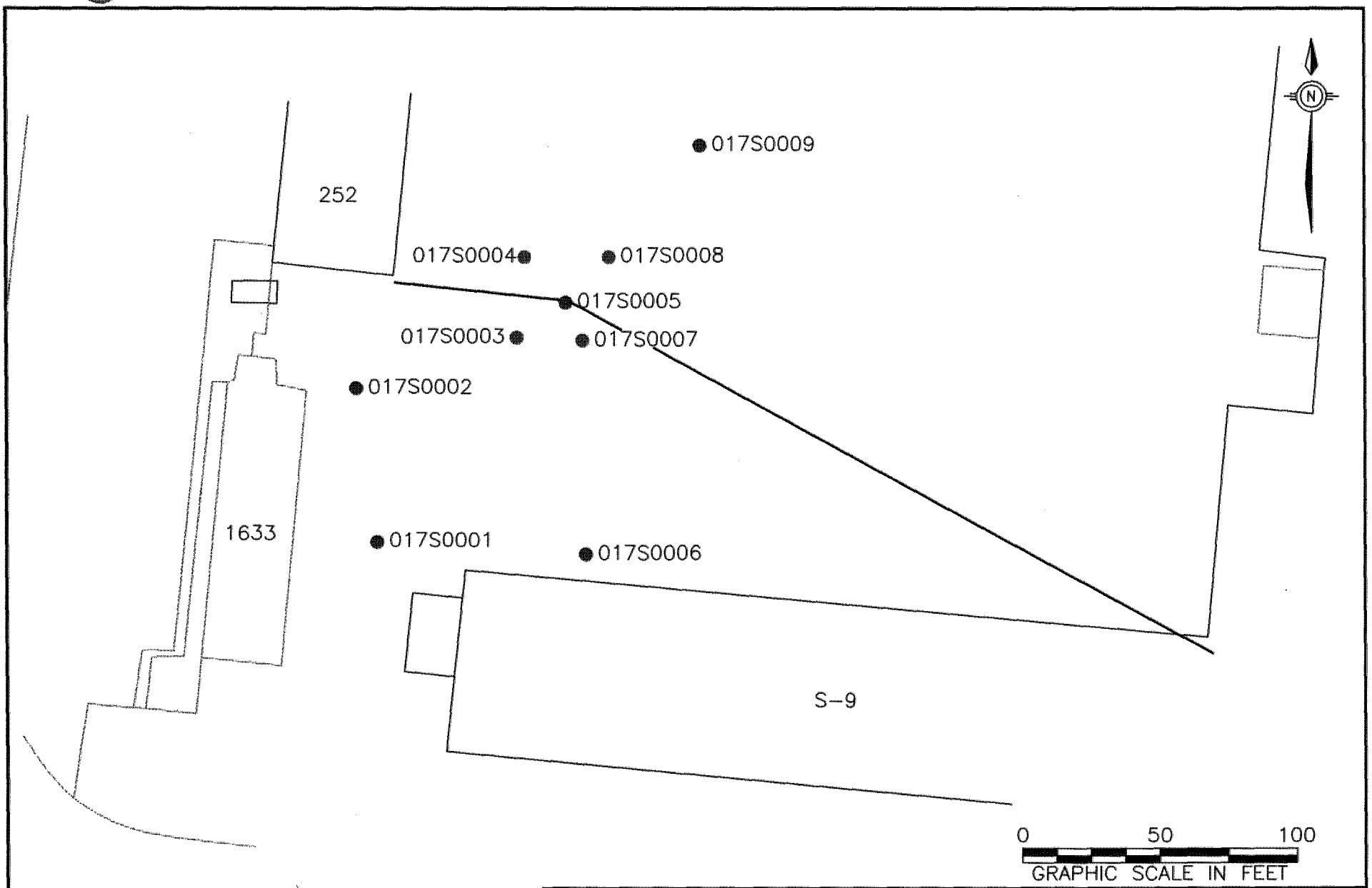
4.2 RFI — DPT Phase

The DPT phase of the RFI was conducted between May 1998 and June 1999 to collect soil and groundwater samples at the Assembly F SWMUs. Tri-State Testing Services, Inc. of Memphis, Tennessee, provided and operated the DPT equipment. The following sections discuss the DPT investigations conducted at each Assembly F SWMU.

4.2.1 SWMU 17 Sampling Rationale

In all, nine locations were sampled at SWMU 17 (Figure 4.1). Subsurface soil samples were collected at all nine locations (017S0001 through 017S0009) from a depth interval of 12 to 15 feet below land surface (bls) which corresponds with the soil-loess groundwater interface. One surface sample was collected at location 017S0001 from a depth interval of 0 to 1 foot bls. The subsurface samples were collected to confirm the presence of any petroleum detected in soil during the tank removal and to determine its extent, if present. The surface soil sample was collected to determine human health risk . Because the history of the tank and its use are uncertain, these samples were submitted for FSA (VOCS, SVOCS, chlorinated pesticides/PCBs, TPH, and Appendix IX metals).

Thirty-nine samples were also collected from 18 locations along the backfilled trench for the piping that once ran from Building S-9 to the UST (Figure 4.2). The samples were collected from native material beneath the trench backfill and from locations north and the south of the trench. These samples were field analyzed for TPH using an infrared field TPH analyzer to define the extent of the contamination resulting from leaks in the pipe that were identified during the removal.



LEGEND

- ● – DPT SOIL SAMPLING LOCATION
- ● – DPT GROUNDWATER AND SOIL SAMPLING LOCATION

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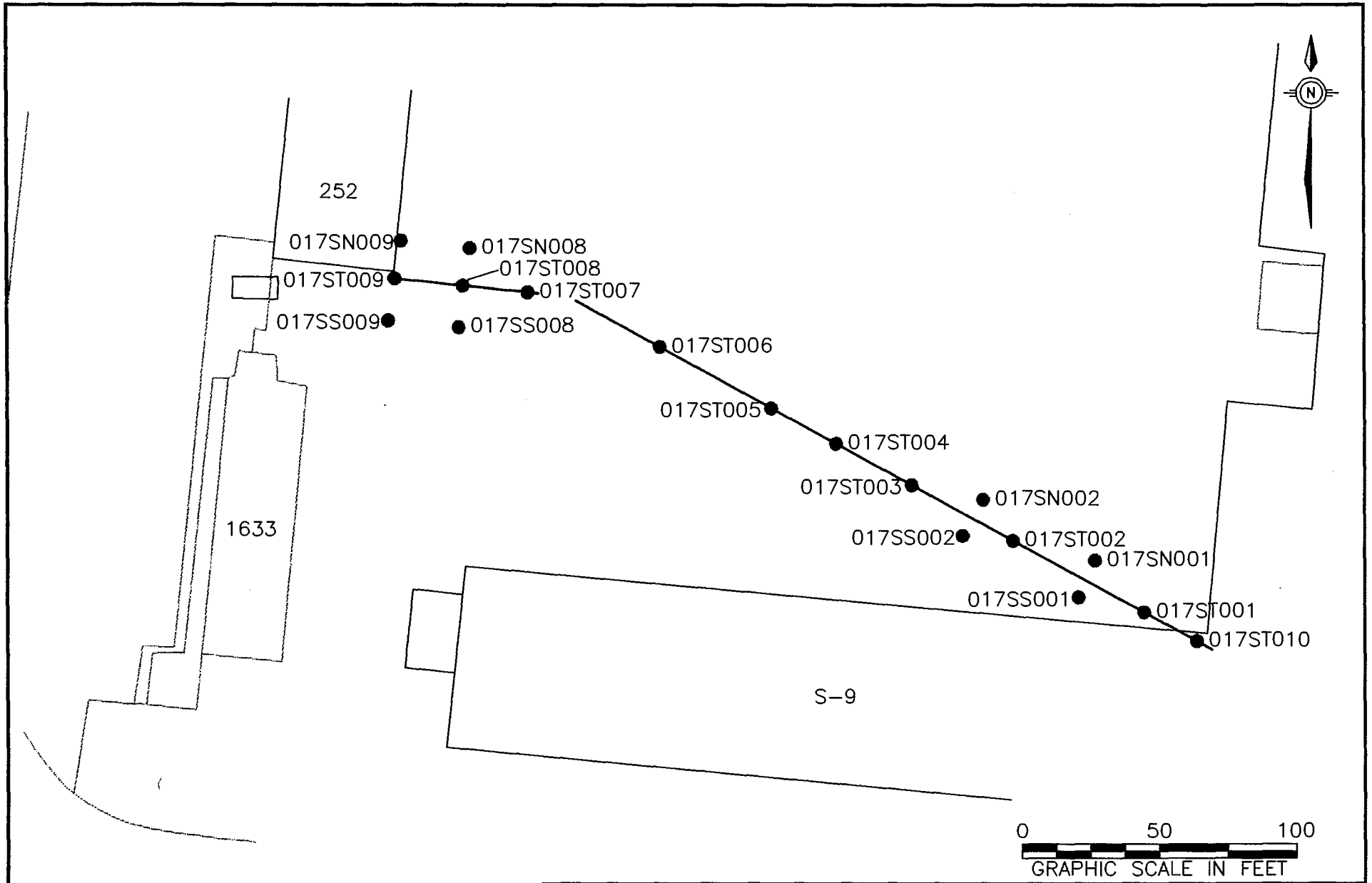
FIGURE 4.1
SWMU 17
SAMPLING LOCATIONS
AROUND UST

DWG DATE: 01/25/00 | DWG NAME: 0140R032



LEGEND

● – DPT SOIL SAMPLING LOCATION

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FIGURE 4.2
SWMU 17
SAMPLING LOCATIONS
ALONG THE FORMER PIPE TRENCH

DWG DATE: 01/25/00 | DWG NAME: 0140R010

The groundwater investigation focused on the fluvial deposits (or deep alluvium) underlying the SWMU 17 loess (or shallow alluvium) because it is the preferential zone of groundwater flow and the primary route for contaminant transport, particularly for chlorinated solvents, at NSA Mid-South. The groundwater investigation consisted of DPT sampling and offsite laboratory analysis. Groundwater samples were collected from five locations at a depth of approximately 50 feet: 017G0001, 017G0002, 017G0005, 017G0006 and 017G0009. All samples were analyzed at an Environmental Testing and Consulting, Inc. for VOCs.

4.2.2 SWMU 19 Sampling Rationale

Although no samples were collected during the RFI phase of the investigation, the analytical data collected during the tank removal and the CSI were re-evaluated to assess the risk to human health and the environment. The CSI consisted of sampling seven locations (019S0001 through 019S0007) using a DPT rig (Figure 4.3). Surface soil samples were collected for risk assessment purposes from locations 019S0001 and 019S0002. Subsurface soil samples were collected at four locations around the former tank pit (019S0003 through 019S0006) from 12 to 15 feet bls. These samples were collected to confirm the suspected release noted during the tank's removal. Groundwater samples were collected from the upper part of the fluvial deposits at locations 019G0001, 019G0002, and 019G0007 from depths of approximately 50 feet bls. Because the tank was used to store waste oil, the soil samples were analyzed for FSA. Groundwater samples were submitted for VOCs only.

4.2.3 SWMU 20 Sampling Rationale

RFI sampling at SWMU 20 consisted of collecting soil and groundwater samples around the former UWT-1594 location (Figure 4.4). Soil samples were collected from two locations, one east and one west of the former tank location from 5 to 7 feet bls to correspond with the estimated depth of the tank pit. One was also collected from 11 to 13 feet bls to obtain data from the loess

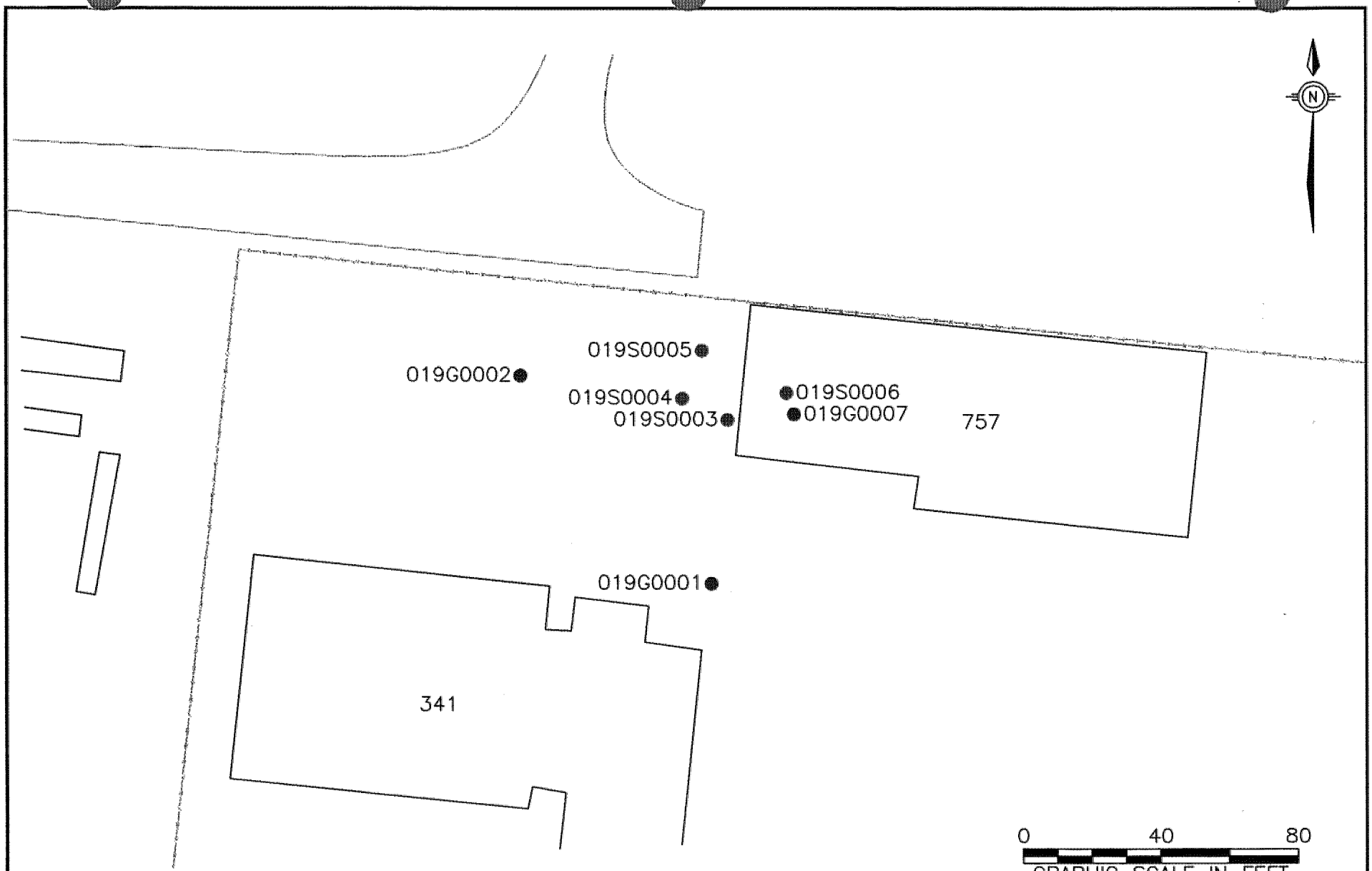
deposits. These locations were selected to establish the horizontal extent of the soil contamination identified during the CSI.

Groundwater samples were collected from three locations around the former tank pit, one north-northeast of the pit, one south of the pit, and one southwest of the pit. Groundwater samples were collected from the fluvial deposits at depths of 40, 50, and 60 feet bls at two locations and 57 feet bls (refusal) at a third location.

A temporary piezometer was installed at each of the three groundwater sampling locations to determine the groundwater flow direction needed at select well locations. The piezometers, which were constructed of 1-inch diameter PVC with 5-foot screens, were installed to 60 feet bls. One groundwater sample was collected from each of the 60-foot piezometers using the DPT rig's vacuum pump, a transfer bottle, and dedicated polyethylene tubing as discussed in Section 4.2.6. One groundwater monitoring well was installed at a location hydraulically downgradient from piezometer 020GPZ03 to confirm the lateral and vertical extent of the compounds detected in groundwater. Samples were collected from 49, 67, and 74 feet bls.

4.2.4 SWMU 22 Sampling Rationale

Soil sampling at SWMU 22 consisted of collecting 13 subsurface soil samples from seven locations (Figure 4.5). These samples were collected to determine whether TPH contamination was still present in soil after tanks 1244, 1245 and 1246 had been removed, because it was reported that the excavated soil, rather than clean fill was used to backfill the tank pits. The locations of the backfilled tank pits were identified using drawings from the SWMU 22 RFA and from aerial photographs. Samples were collected from three locations within the former pit of tank 1244 (022SGB11, 022SGB12 and 022SGB13). Refusal was encountered at 6 feet bls in locations 022SGB11 and 022SGB12. The samplers retrieved from these borings had bits of concrete and



LEGEND

- ● – DPT SOIL SAMPLING LOCATION
- ● – DPT GROUNDWATER AND SOIL SAMPLING LOCATION

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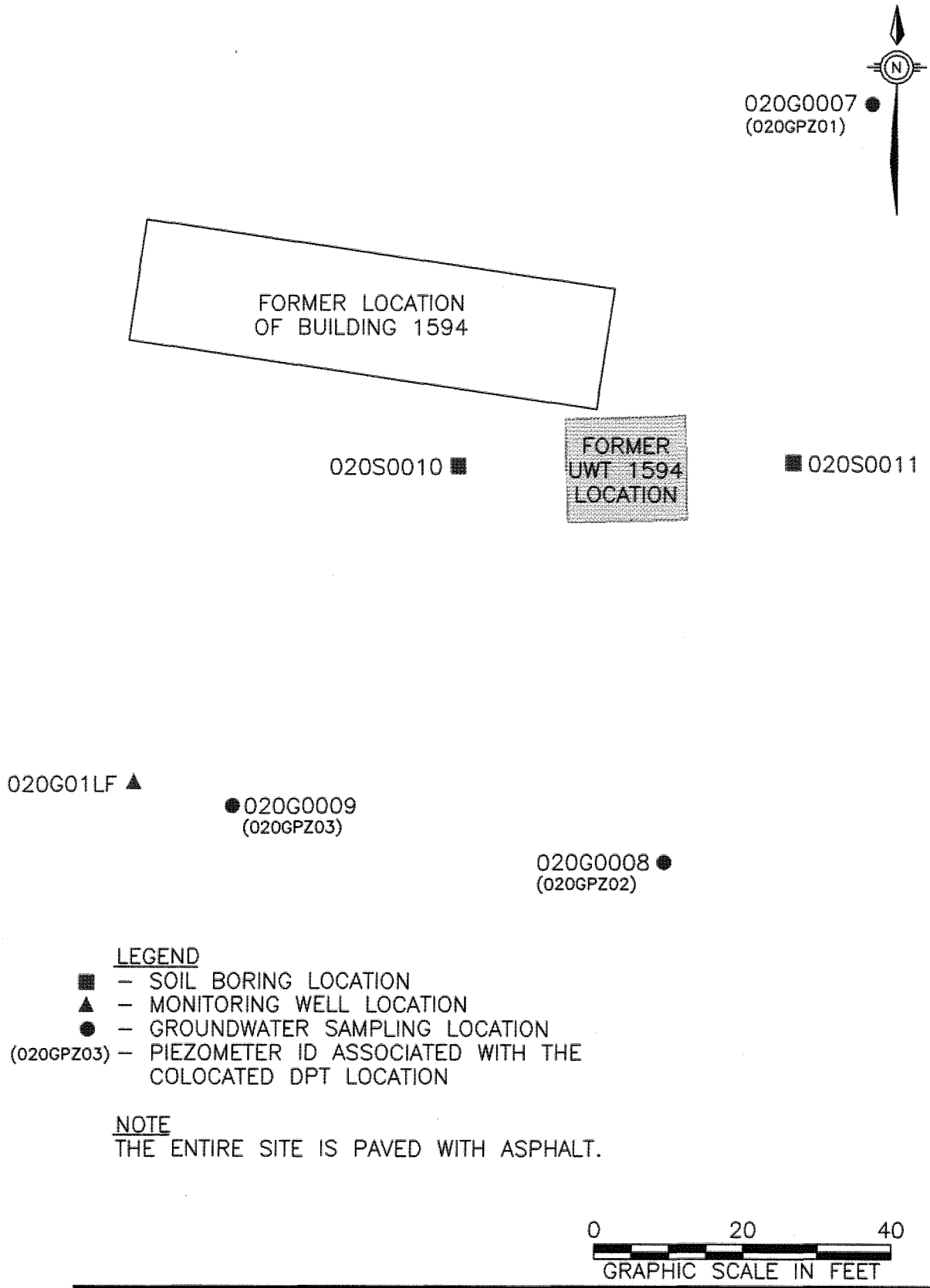
FIGURE 4.3
SWMU 19
SOIL AND GROUNDWATER
SAMPLING LOCATIONS

DWG DATE: 01/25/00 | DWG NAME: 0140R011



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NSA MID-SOUTH
MILLINGTON, TENNESSEE

FIGURE 4.4
SWMU 20
RFI SAMPLING LOCATIONS

DWG DATE: 01/25/00 | DWG NAME: 0140R012

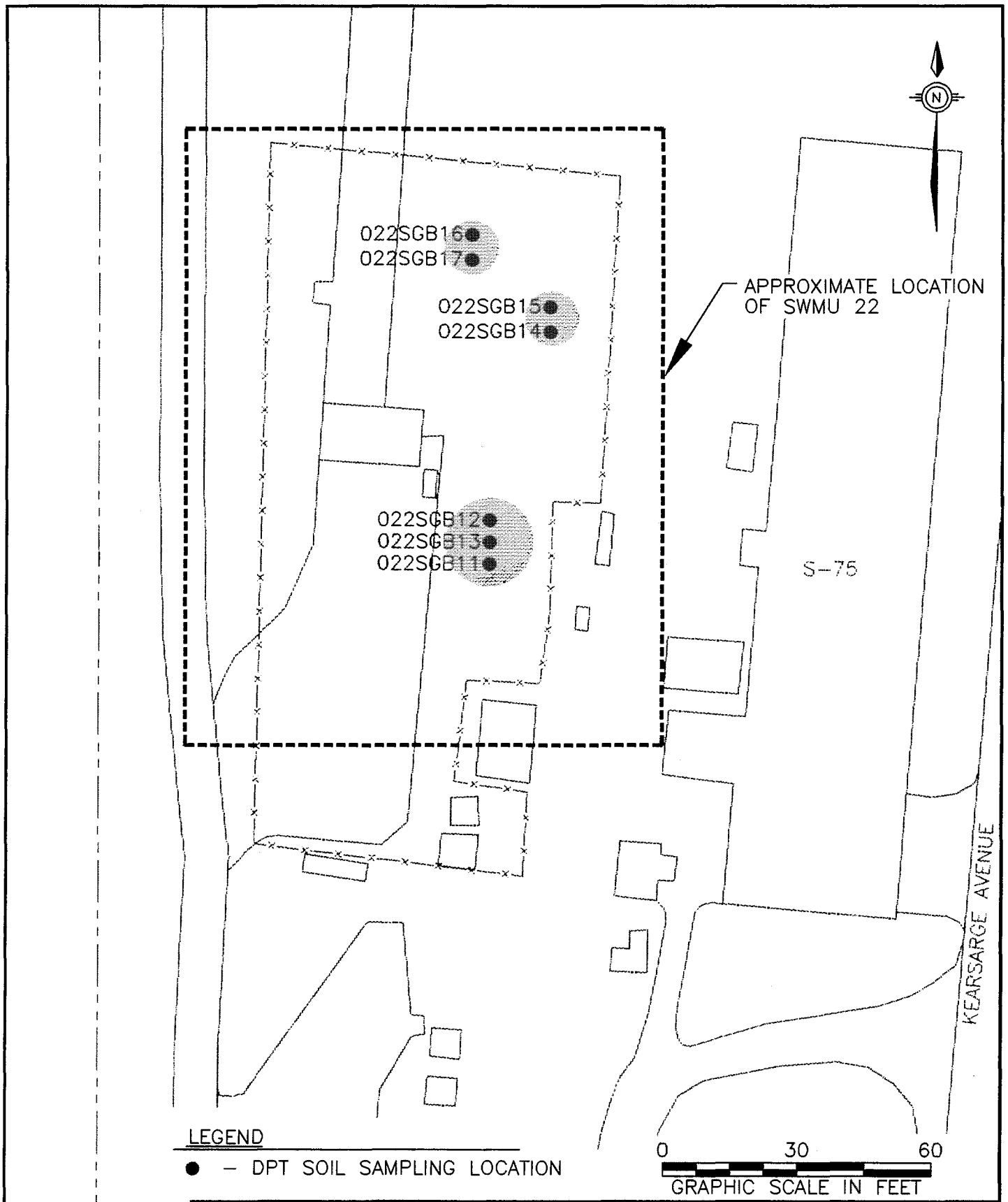

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FIGURE 4.5
SWMU 22
DPT LOCATIONS

DWG DATE: 01/25/00 | DWG NAME: 0140R030

a hard, black substance with a petroleum odor lodged in their cutting shoes. It is possible that this is the crushed concrete tank pad and petroleum-contaminated soil pushed back into the pit after the tanks were removed. Boring 022SGB13 was completed at 20 feet bls. No fill was encountered at this location so, this boring was the only one of the three sampled in the pit of UST-1244 that was completed to its proposed depth. Two locations were sampled through the fill of the pits for tanks 1245 (022GB14 and 022SGB15) and 1246 (022SGB16 and 022SGB17). Refusal was not encountered during completion of these four borings.

Samples were collected continuously at 2-foot intervals to a depth of 20 feet bls or refusal, whichever was encountered first. Samples were selected for offsite laboratory analysis by conducting onsite headspace analysis using a flame ionization detector (FID). The sample from the terminal depth of the boring and the sample with the highest organic vapor concentration measured during headspace analysis were submitted to the laboratory for TPH-GRO and extractable petroleum hydrocarbons (EPH) analyses by SW-846 Method 8015B.

4.2.5 SWMU 39 Sampling Rationale

The DPT investigation at SWMU 39 consisted of collecting soil samples from one location and groundwater samples from 45 locations; five were completed as temporary piezometers. Ten groundwater sampling locations and three temporary piezometers had been proposed in the RFI work plan. During the investigation, the scope was expanded to fully define the extent of the contaminant plume, which resulted in the installation of two additional piezometers. All DPT sampling points are shown on Figure 4.6 and the piezometer locations are show on Figure 4.7.

Soil samples were collected from one location near the southeast corner of the Building S-74 foundation where the Navy laundry was once located. Samples were collected at 9 to 11 and 11 to 13 feet bls to confirm the presence of the contamination detected during the CSI. Soil samples were also collected beneath the concrete slab of the former Building S-74. The samples were

collected from 0 to 1 foot bls to determine any impact to soil beneath the building. As shown on Figure 4.8, the sample locations were colocated with floor drains, where spent drycleaning solvents may have been disposed of.

Initially, 10 groundwater samples were collected from 10 locations around the Building S-74 foundation and Building S-75 (SWMU 22 area). Six locations were completed along a line running east to west, south of the buildings. Three locations were completed along a line running north to southwest of Building S-75, adjacent to the Navy property line. One location was completed north of the Building S-74 foundation, southwest of Building S-203.

4.2.6 Soil Sample Collection Method

As previously stated, soil samples were collected and analyzed for VOCs using EPA Method 5035 with an EnCore sampler which consists of a T-shaped handle that holds a disposable sample container. The sample container was affixed to the T-handle, then pushed into the soil core. As the sampler was forced into the soil core, a plunger was pushed back, allowing the sample to fill the container and preventing trapped air pockets. When full, the sampler was sealed with an airtight, locking cap, and removed from the handle. The EnCore samples, like other samples, were labeled with an unique identification number and time and date, packed on ice in a cooler, and shipped to the laboratory under chain-of-custody for preserve within 48 hours. Two EnCore samples and one 4-ounce soil jar were collected from each interval.

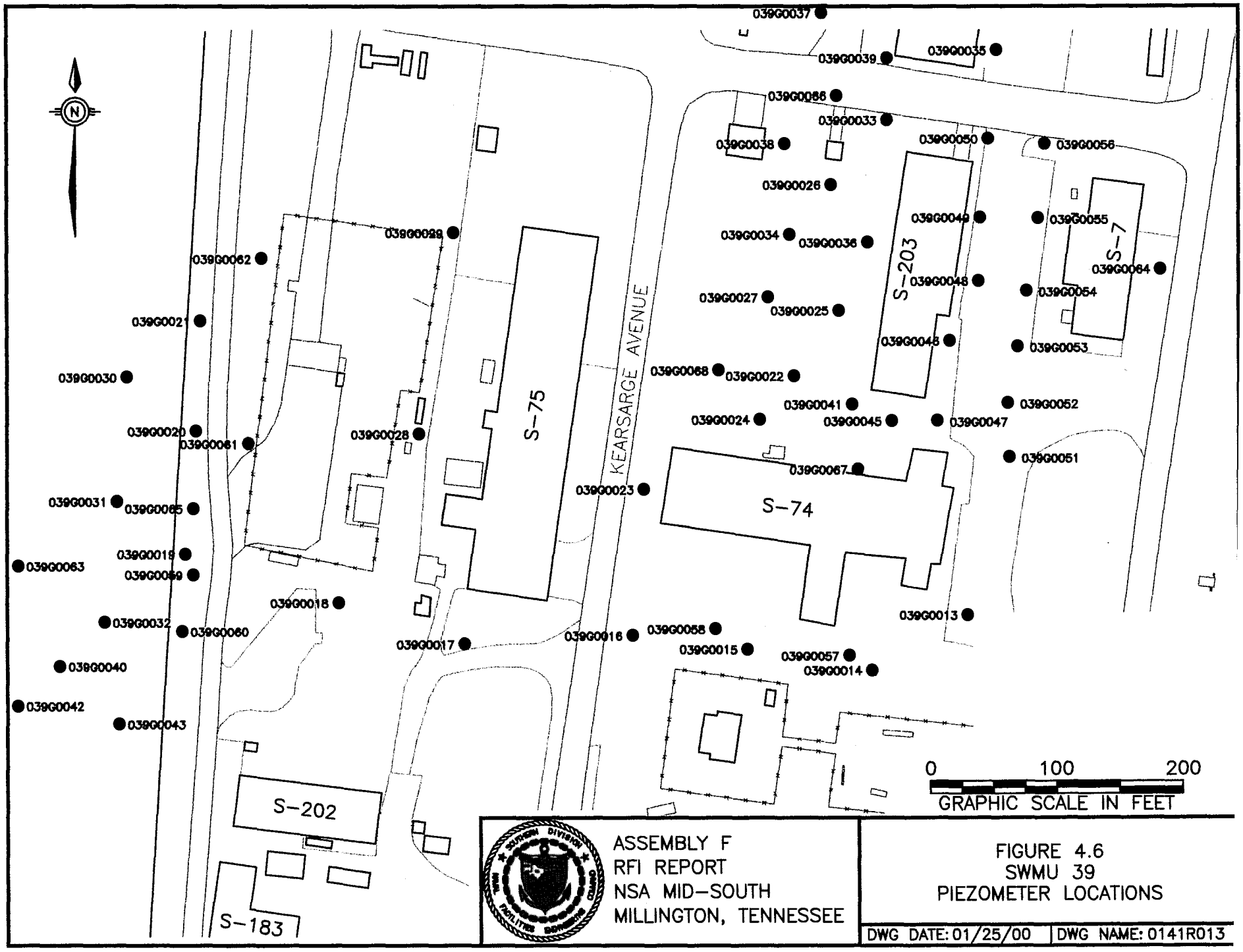

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FIGURE 4.6
SWMU 39
PIEZOMETER LOCATIONS

DWG DATE: 01/25/00 | DWG NAME: 0141R013

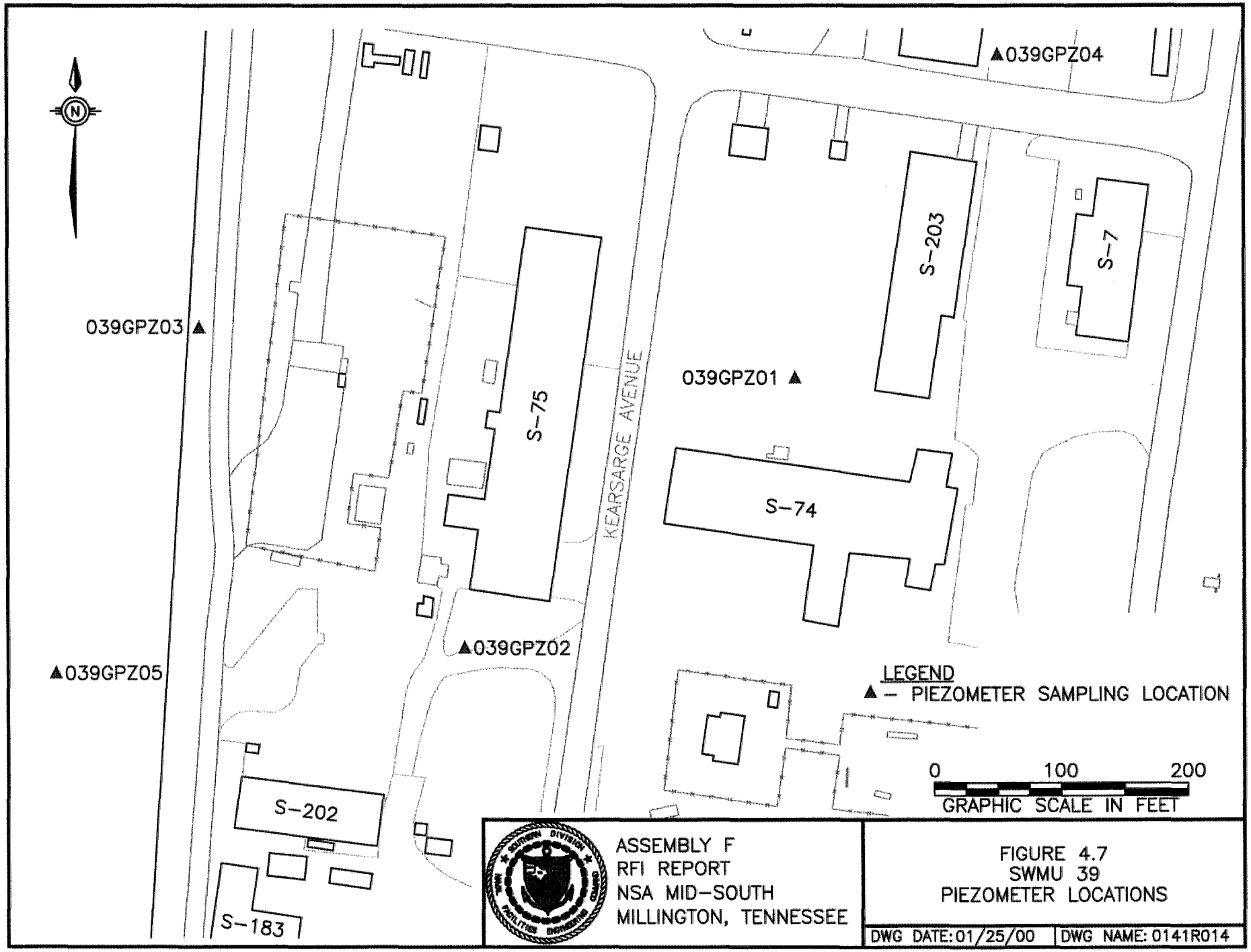
N
039GPZ03
039GPZ05
039GPZ02
039GPZ01
039GPZ04
S-75
S-203
S-7
S-74
S-202
S-183
KEARSARGE AVENUE
LEGEND
▲ – PIEZOMETER SAMPLING LOCATION
0
100
200
GRAPHIC SCALE IN FEET
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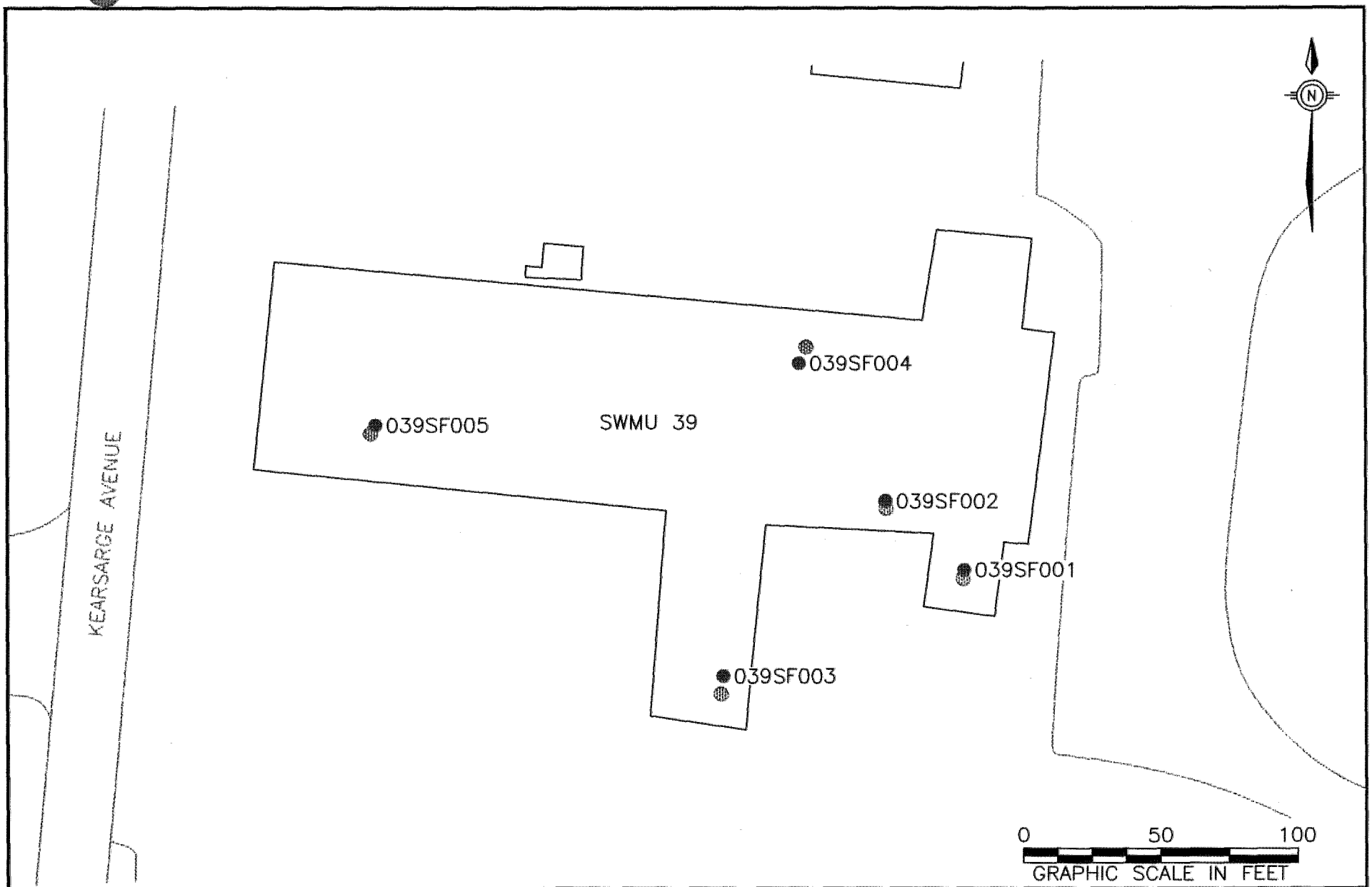
FIGURE 4.7
SWMU 39
PIEZOMETER LOCATIONS
DWG DATE: 01/25/00
DWG NAME: 0141R014



LEGEND

- ● – DPT SOIL SAMPLING LOCATION
- ◍ – FLOOR DRAIN

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MILLINGTON, TENNESSEE

FIGURE 4.8
SWMU 39
SOIL SAMPLES BENEATH SLAB

DWG DATE: 01/25/00 | DWG NAME: 0140R015

4.2.7 Groundwater Sample Collection Method

Groundwater samples were collected by advancing the DPT screen point sampler to the target depth for sample collection. The sampler was opened to expose the screen and allow water to flow through it and into the sampler. A threaded adapter was fitted on the end of a new piece of clean polyethylene tubing that had been inserted into the rod string and lowered to the top of the sampler. The adapter was then threaded onto a nipple on the top of the screen point by twisting the tubing. A vacuum pump, mounted on the DPT rig, was attached to a transfer bottle and activated to purge the DPT rods in an attempt to lower the turbidity. After the rods were purged sufficiently, the tubing was crimped to hold in the water and the pump was deactivated. The tubing was pulled free from the nipple and retrieved from the rod string. After the tubing was removed from the rods, the tube's contents were gently drained into the sample containers to minimize agitation. If no groundwater entered the sampler, the rods were retrieved so the sampler could be closed. The sampler was then driven an additional 3 to 4 feet and another attempt was made.

4.2.8 Temporary Piezometer Installation Procedure

The piezometers were constructed of 1-inch diameter PVC riser pipe, with 5-foot long, 0.01-inch slot, PVC screens of the same diameter. The piezometers were completed at a depth of approximately 60 feet below ground surface to measure the static water level and calculate the groundwater flow direction in the fluvial deposits aquifer. The piezometers were installed as a cost-effective alternate to wells for determining the groundwater flow direction and the preliminary extent of contamination.

The piezometers were installed with a DPT rig using a double rod system of inner and outer rods. One section of inner rod was fitted with an expendable, stainless-steel drive point and inserted into a section of outer rod. The drive point on the inner rod prevents soil from entering the outer rod as the rod string is pressed into the ground. New inner and outer rods were added as the rod

string was advanced into the ground. When the target depth was reached, the inner rods were removed, leaving the outer rods in place to hold the hole open during piezometer installation.

The piezometer screen and riser were lowered through the outer rods to the bottom of the hole. Once the piezometer was in place, the rods were slowly pulled to approximately 2 feet above the piezometer screen, allowing the fluvial deposits sand to collapse around the screen. In case the amount of native material that collapsed was not enough, filter sand was also installed by slowly pouring it through the annulus between the piezometer and the outer rods.

After the sand had been emplaced around the screen, the outer rods were pulled from the hole, which was then sealed to ground surface by slowly pouring granulated bentonite down the annulus between the rods and the hole walls. The bentonite granules in the vadose zone were hydrated with deionized water. The piezometers were completed as flush-mounts in high traffic areas (i.e, paved areas and Eastman Park). Piezometers in unpaved areas were completed aboveground as temporary structures, and as a cost saving measure, no protective casing or concrete pads were installed around the exposed casing. Instead, three steel fence posts were installed around the piezometer to reduce the chance of damage. Flush-mount wells were completed with water-tight manhole assemblies and concrete pads. All piezometers were fitted with locking expansion caps.

4.2.9 Piezometer Abandonment Procedures

Three aboveground piezometers at SWMU 39 were abandoned in July 1999 following the well abandonment procedures outlined by the Memphis/Shelby County Health Department. The piezometer casings and screens were pulled from the ground. The remaining hole was then sealed with granulated bentonite to ground surface and the steel fence posts were removed from around the aboveground completions.

4.3 RFI — Well Phase

After the DPT phase was complete and the horizontal extent of the contaminants had been determined, the monitoring well phase was implemented. A total of 10 monitoring wells, nine at SWMU 39 and one at SWMU 20, were installed. The wells were installed using rotasonic drilling techniques as described in the *Comprehensive RFI Work Plan, Naval Air Station Memphis, Millington, Tennessee, October 6, 1994.* This drilling method has been used to install most of the wells installed as part of the RFI at NSA Mid-South and was selected due to its speed, and the high quality of well construction and lithologic information. Alliance Environmental, Inc. of Marietta, Ohio, provided and operated the rotasonic drilling equipment used to collect the soil samples for design parameters and Shelby tube samples and core samples for lithologic description. The following sections describe the rotasonic drilling technique and well installation at both SWMUs.

4.3.1 SWMU 20 — Monitoring Well Placement Rationale

One monitoring well was installed at SWMU 20 (Figure 4.4). CSI sampling indicated only one sample location where any contaminants exceeded tap-water risk-based concentrations and maximum contaminant levels. The sample results from the piezometer locations around the former tank location were nondetect for all parameters. The lack of detections and the direction of groundwater flow, determined from the piezometers, indicated that the contamination's horizontal extent had been defined. Because of the limited detections at the site in previous sampling events, it was necessary to install only one fully penetrating monitoring well at SWMU 20. It was installed near an area where contamination was encountered during the DPT sampling phase with a screened interval extending from the loess/fluvial deposits contact to the fluvial deposits/Cockfield Formation contact (46 to 76 feet bls). Samples were collected throughout the screened interval using diffusion samplers to define the contamination's vertical extent.

During well installation, one Shelby tube sample was collected from within the loess (33 to 34.5 feet bls). Permeability data from this sample have been used to select a TPH action level for this site.

4.3.2 SWMU 39 — Monitoring Well Placement Rationale

Nine monitoring wells were installed at SWMU 39. The locations were selected by analyzing the DPT phase screening sample data. Five distinct contaminated areas were identified in the SWMU 39 investigation area, four onsite and one offsite. One well was installed in each of these five contaminated areas. Additionally, one upgradient well was installed, and three wells were installed along the base's western property line. Figure 4.9 presents the contaminated areas and well locations.

All wells were completed with well screens that fully penetrate the fluvial deposits aquifer. The top of the well screens extend from 2 to 3 feet below the loess deposits to a few feet into the top of the Cockfield Formation. The screened interval depths for each well are on the boring logs in Appendix A.

4.4 Sampling Protocol

All DPT sampling activities adhered to the approved *Comprehensive RFI Work Plan, Naval Air Station Memphis, Millington, Tennessee* (October 6, 1994). Where warranted by field conditions, deviations from the approved procedures were conducted and appropriately documented in the site logbook.

Groundwater samples were collected from monitoring wells using diffusion samplers, which (polyethylene bags filled with deionized water), which are lowered into the well screen. The concentration gradient between VOCs in the groundwater and the deionized water results in an osmotic pressure on the polyethylene membrane, and eventually the diffusion of contaminants into the sampler.

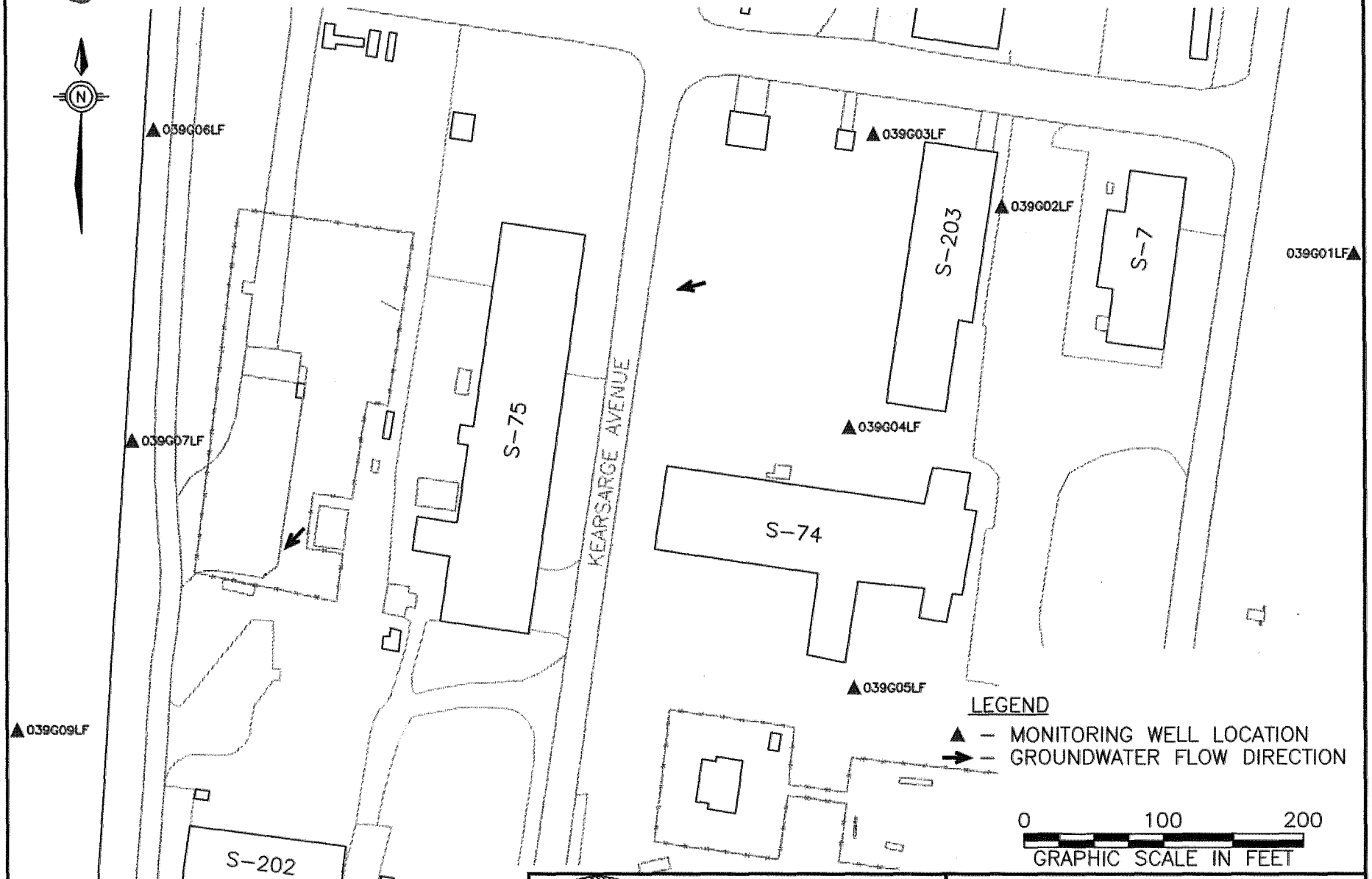

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FIGURE 4.9
SWMU 39
MONITORING WELL LOCATIONS

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The samplers consisted of a 4 mil thick polyethylene bag measuring 1 inch in diameter by 2 feet long, which was filled with deionized water. Multiple sample intervals were selected for each well using the DPT groundwater sample data and lithologic data from well installation. Samplers were tied to a length of twine at the selected depth intervals. Stainless-steel weights were tied to the bottom end of the bag at the deepest interval. After the bags were secured to the twine, the string of samplers was lowered into the well. The twine's surface end was tied to a small eye hood, which was screwed into the bottom of the well cap. The samplers were left in the well for two weeks and allowed to equilibrate. When retrieved, the top of the sampler was slit open and the water gently poured into 40-milliliter, pre-preserved glass vials and shipped to the laboratory for VOC analysis.

4.4.1 Quality Assurance/Quality Control

Quality assurance/quality control procedures followed during the RFI adhered to Section 4.14 of the *Comprehensive RFI Work Plan (October 6, 1994)*.

4.4.2 Sample Management

RFI sample management procedures during the RFI adhered to Sections 4.12 and 5 of the *Comprehensive RFI Work Plan*.

4.4.3 Sample Custody

RFI sample custody during the RFI adhered to Section 4.12.5 of the *Comprehensive RFI Work Plan*.

4.4.4 Sample Labeling

All samples collected in the field were labeled with a 10-digit alphanumeric code that identified the site, sample type, sample location, sample depth, and QA sample type (as appropriate). The first three digits identify the site location (SWMU 15 = 015). The fourth digit identifies the

sample type (soil = S, soil duplicate = C, groundwater = G, groundwater duplicate = H). The matrix codes are listed with the analytical data in Appendix C of this report. The fifth through eighth digits represent the station location (location 12 = 0012, upper fluvial well 3 = 03UF). The final two digits represent the deepest point of the sample interval for soil (15 to 17 feet = 17), screened interval for DPT groundwater samples (38 to 40 feet = 40), or the sampling event for groundwater monitoring wells (01 = first sampling event).

Examples:

DPT Samples

015S000307 = SWMU 15/soil/location 3/5 to 7 feet bls

015H000240 = SWMU 15/duplicate groundwater/location 2/screened interval 38 to 40 feet bls

RFI Samples

015S02UF17 = SWMU 15/soil/upper fluvial deposits monitoring well 2/15 to 17 feet bls

015G04UF01 = SWMU 15/groundwater/upper fluvial deposits monitoring well 4/first event

4.5 Data Validation

Data validation was conducted in accordance with Section 5 of the *Comprehensive RFI Work Plan*.

4.6 Decontamination Procedures

Field equipment was decontaminated in accordance with the *Assembly F Site Investigation Plans* (July 8, 1996) and the *Comprehensive RFI Work Plan*.

4.7 Investigation-Derived Waste

During the DPT investigations, subsurface soil samples and groundwater samples were collected directly from the Geoprobe soil and groundwater samplers; therefore, these sampling activities generated no IDW.

During the RFI well phase, soil cuttings, drilling fluids, and groundwater were stored in labeled 55-gallon drums. Soil drums were transported to SWMU 41 (DRMO) and spread on the ground (Technical Memorandum *Characterization of Investigation-Derived Waste from Assembly A SWMUs; NAS Memphis RFI; Millington, Tennessee,* June 6, 1995). Water drums were transported to the decontamination pad and transferred into a 2,000-gallon tank. When the tank was filled, a grab sample was collected for VOC analysis. After review of the analytical data, and approval from the publically owned treatment works, the tank contents were discharged.

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5.0 NATURE AND EXTENT OF CONTAMINATION

Contaminant risk-based concentrations (RBCs) and soil screening levels (SSLs) used to evaluate the potential transfer from soil to groundwater are used to assess organic compounds and inorganics concentrations in soil samples. RBC and SSL criteria are outlined in the USEPA Region III Risk-Based Concentration Table (October 1999) and in the Office of Solid Waste and Emergency Response (OSWER) guidance for lead concentrations in soil (USEPA, 1994). SSLs with a dillution-attenuation factor (DAF) of 1 were used for more concervative screening.

Surface soil samples are compared to residential and industrial RBCs. SSLs, as indicated in the RBC table, should be compared to the contaminant average in each borehole, beginning at 6 inches bls and ending at the termination of the borehole. To simplify the comparison of SSLs to contaminants, and since data collected during the RFI did not begin at 6 inches bls, the maximum concentration of each constituent is compared to the SSL value, rather than the borehole average, offering a more conservative comparison. Individual contaminants exceeding SSL values are evaluated in the fate and transport discussion (Section 6). RBCs for tap water and MCLs for drinking water are used to evaluate concentrations of the contaminants detected in groundwater samples. Tap water RBCs are from the USEPA RBC table; MCLs for drinking water are from USEPA Drinking Water Regulations and Health Advisories (1996a).

To determine if their concentrations represent ambient conditions, inorganics in surface soil, subsurface soil, and groundwater are also compared to established background reference concentrations (RCs, or two times the mean background concentration). Background RC calculations were provided in the *Reference Concentration Technical Memorandum* (E/A&H, August, 1996b).

Because it has no RBC or SSL, TPH soil concentrations were compared with two sets of screening criteria. One set is from the TDEC, Division of Underground Storage Tank's Reference Handbook. In which TDEC established three soil cleanup levels for TPH in soil overlying both drinking and nondrinking water aquifers. Site-specific cleanup levels are selected based on soil permeabilities. SWMU 20 was assigned the 500 ppm cleanup level based on the 10^{-5} cm/sec permeability (Table 2.1) measured in its Shelby tube sample. The 1,000 ppm cleanup level was assigned to SWMUs 17, 19, and 39 based on their 10^{-6} cm/sec permeabilities. Because no permeability data are available for SWMU 22, the 500 ppm cleanup level was assumed.

The second guideline was established by the NSA Mid-South Public Works Department — Environmental Division. The activity has established a 100 ppm cleanup level for petroleum contaminated soil less than 5 feet bls, regardless of soil permeability.

Section 5.1 briefly discusses background and reference criteria. Sections 5.2 to Section 5.6 compares soil and groundwater contaminants to their RBC, SSL, MCL, and RC values for SWMUs 17 to 39, and Section 5.7 summarizes soil contaminants that exceed RBCs and background RCs (where applicable); soil contaminants that exceed SSLs and background RCs (where applicable); and groundwater contaminants that exceed their RBCs, MCLs, and background RCs (where applicable). Soil and groundwater contaminants are further evaluated in the fate and transport section, and ecological and human health risk assessments (Sections 6, 7, and 8).

5.1 Background and Reference Criteria

Background locations were established at 13 locations at NSA Mid-South (shown on Figure 5.1) to determine ambient soil and groundwater quality conditions. Background data for soil consist of 13 surface samples and five subsurface soil samples, while groundwater data are from monitoring well clusters at 12 of the 13 locations. Background monitoring wells were not installed

NOTES:

1. SURFACE SOIL BACKGROUND DATA COLLECTED FROM BACKGROUND LOCATIONS BG-1 THROUGH BG-13.
2. SUBSURFACE SOIL BACKGROUND DATA COLLECTED FROM BACKGROUND LOCATIONS BG-1 THROUGH BG-5.
3. LOESS AND LOWER FLUVIAL DEPOSITS GROUNDWATER DATA COLLECTED FROM BACKGROUND LOCATIONS BG-1, BG-2, BG-4 AND BG-5.
4. UPPER FLUVIAL DEPOSITS GROUNDWATER DATA COLLECTED FROM BACKGROUND LOCATIONS BG-1, BG-2, BG-4, BG-5 BG-8, BG-10, BG-12, AND BG-13.
5. MIDDLE FLUVIAL DEPOSITS GROUNDWATER DATA COLLECTED FROM BACKGROUND LOCATION BG-9.
6. MIDDLE ALLUVIUM GROUNDWATER DATA COLLECTED FROM BACKGROUND LOCATION BG-11.
7. UPPER COCKFIELD GROUNDWATER DATA COLLECTED FROM BACKGROUND LOCATIONS BG-6 AND BG-7.

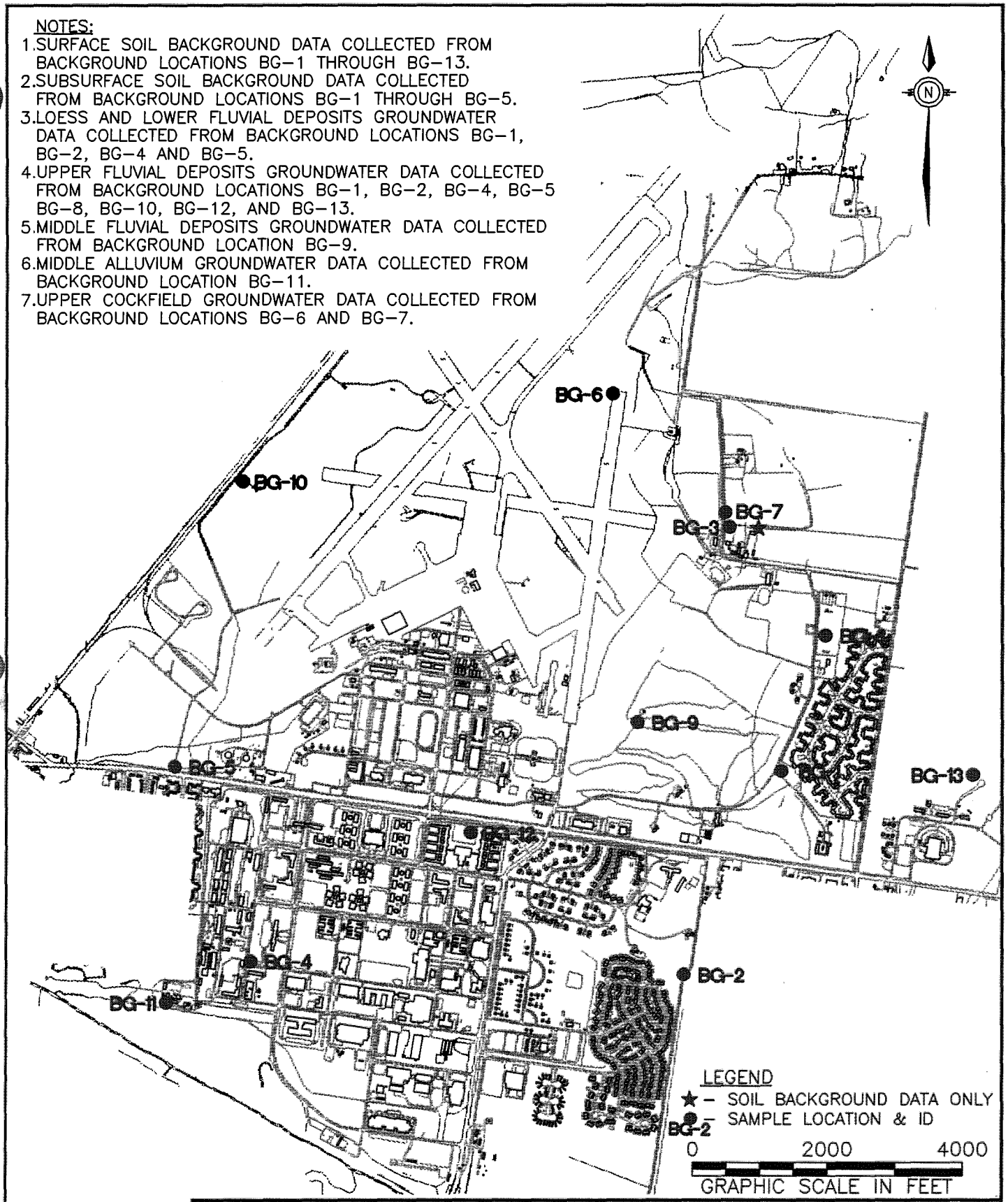

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FIGURE 5.1
BACKGROUND SAMPLE LOCATIONS

DWG DATE: 01/25/00 | DWG NAME: 0141R029

at location BG-3, near the horse stables on the NSA Northside, due to the absence of groundwater in the loess and the thinness of the fluvial deposits in this area. At the other background locations, a well cluster consists of three monitoring wells screened at three depth intervals — one in the uppermost part of the loess, one in the uppermost part of the fluvial deposits, and one in the basal section of the fluvial deposits. See the *Reference Concentration Technical Memorandum* (E/A&H, August 1996) for the method used to calculate these reference concentrations.

5.2 SWMU 17 — Analytical Results

The two-phased DPT investigation at SWMU 17 focused on contamination associated with the former underground waste oil tank and the associated piping. A total of 27 locations were sampled. During the initial phase, which focused on the tank pit, soil samples were collected at nine locations (017S0001 to 017S0009) and analyzed at an offsite laboratory for VOCs, SVOCs, PCBs, TPH, and Appendix IX metals. These analytical parameters were selected due to the nature of the suspected release (waste oil and hydraulic fluid). From these locations, subsurface soil was sampled from 12 to 15 feet bls. One surface soil sample was collected from location 017S0001. Fluvial deposits groundwater samples were collected and analyzed from five of these locations: 017G0001, 017G0002, 017G0005, 017G0006 and 017G0009. Two were collected from 48 feet bls, and three were collected from 49 feet bls.

During the second phase, which focused on the buried pipe that ran from the tank to Building S-9, 39 samples were collected from 18 locations (see Figure 4.2 in Section 4) and field screened for TPH using an IR TPH analyzer. The results of the field screening analysis are presented in Table 5.1 and Figure 5.2. Of these samples, three were collected from 0 to 2 feet bls, 15 from 2 to 3 feet bls, 18 from 3 to 4 feet bls, 1 from 4 to 5 feet, 1 from 6 to 7 feet, and 1 from 7 to 8 feet. Samples were collected in the trench, north of the trench, and south of the trench. The sample's location, which is identified in the sample nomenclature as T, N, or S, indicates a Trench, North of trench, or South of trench location. For example, location 017SN001 was sampled at SWMU 17 at location 1 north of the trench. Samples 017ST001 and 017SS001 indicate location 1 within the trench and south of the trench respectively.

5.2.1 SWMU 17 — VOCs in Soil

The following VOCs were detected in soil samples analyzed at the offsite laboratory by SW-846 Method 8260:

Acetone	Styrene	Toluene
Benzene	Tetrachloroethene	Xylene (total)
Ethylbenzene		

Table 5.2 and Figure 5.3 summarize the organics detected in the surface and subsurface soil samples analyzed at the offsite laboratory.

Acetone was not detected in the surface soil sample. Concentrations in subsurface soil ranged from 15 to 50 micrograms per kilogram (μg/kg). Acetone did not exceed its RBCs or SSL.

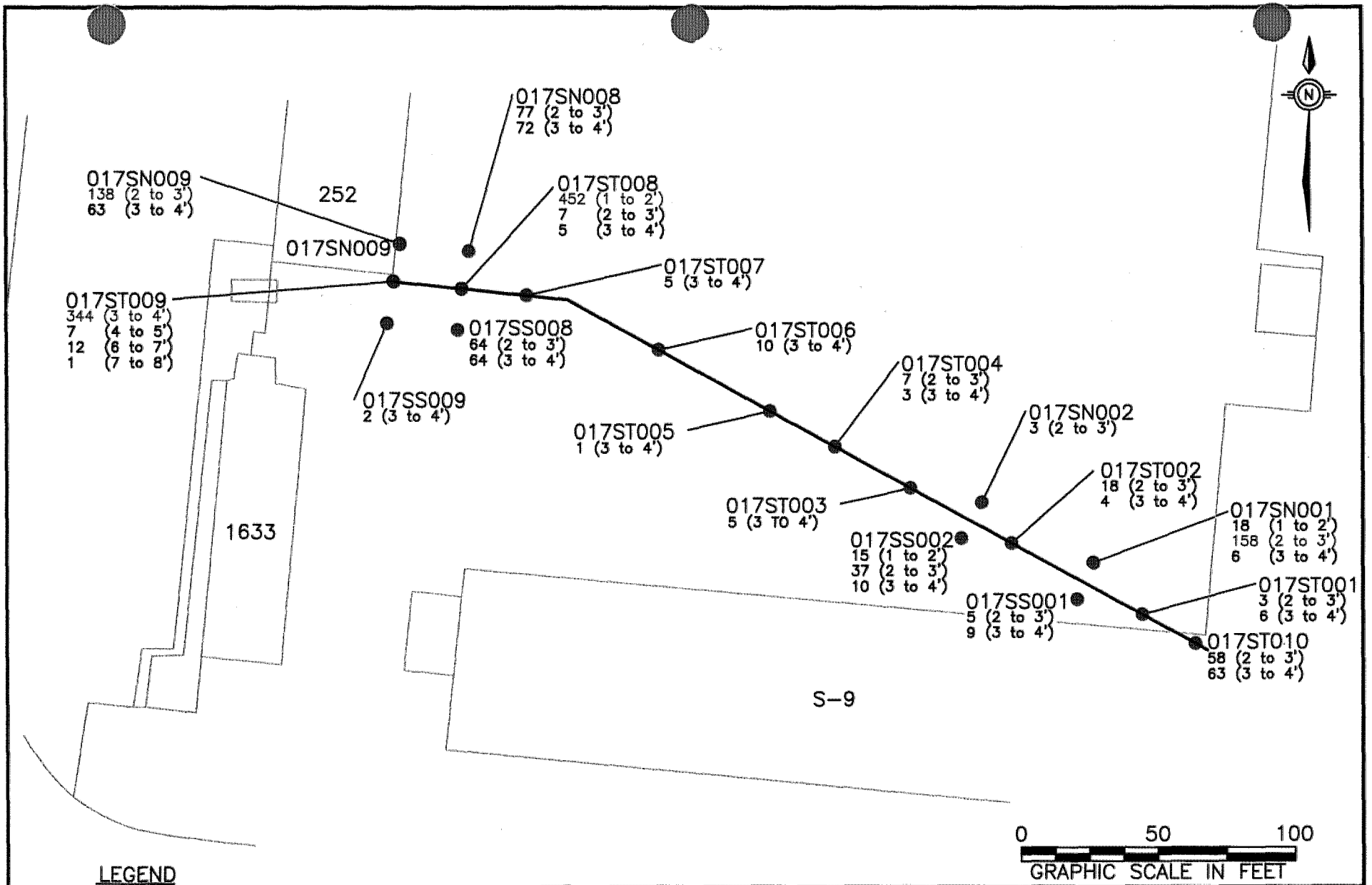
Benzene exceeded its SSL of 0.1 μg/kg in three subsurface samples: 017S000215, 017S000315 and 017S000815. Benzene concentrations in subsurface soil ranged from 2.3 to 3.3 μg/kg.

Ethylbenzene was detected in one surface soil sample at 370 μg/kg, which does not exceed its RBCs or SSL. It was not detected in subsurface soil.

Styrene was detected in one surface soil sample at 31 μg/kg. It was not detected in subsurface soil. Styrene did not exceed its RBCs or SSL in any sample.

Tetrachloroethene exceeded its SSL in surface soil sample 017S000101 at 17 μg/kg. It was also detected in subsurface soil sample 017S000315, but it did not exceed either its SSL or RBCs.

Toluene was detected in one surface soil sample at 140 μg/kg. It was not detected in subsurface soil. Toluene did not exceed its RBCs or SSL in any sample.



LEGEND

- ● – DPT SAMPLING LOCATION
- ● – SAMPLE LOCATION WHERE TPH EXCEEDS 100PPM CLEANUP LEVEL
- 5 (3 to 4') – TPH CONCENTRATION IN PPM AND SAMPLE DEPTH

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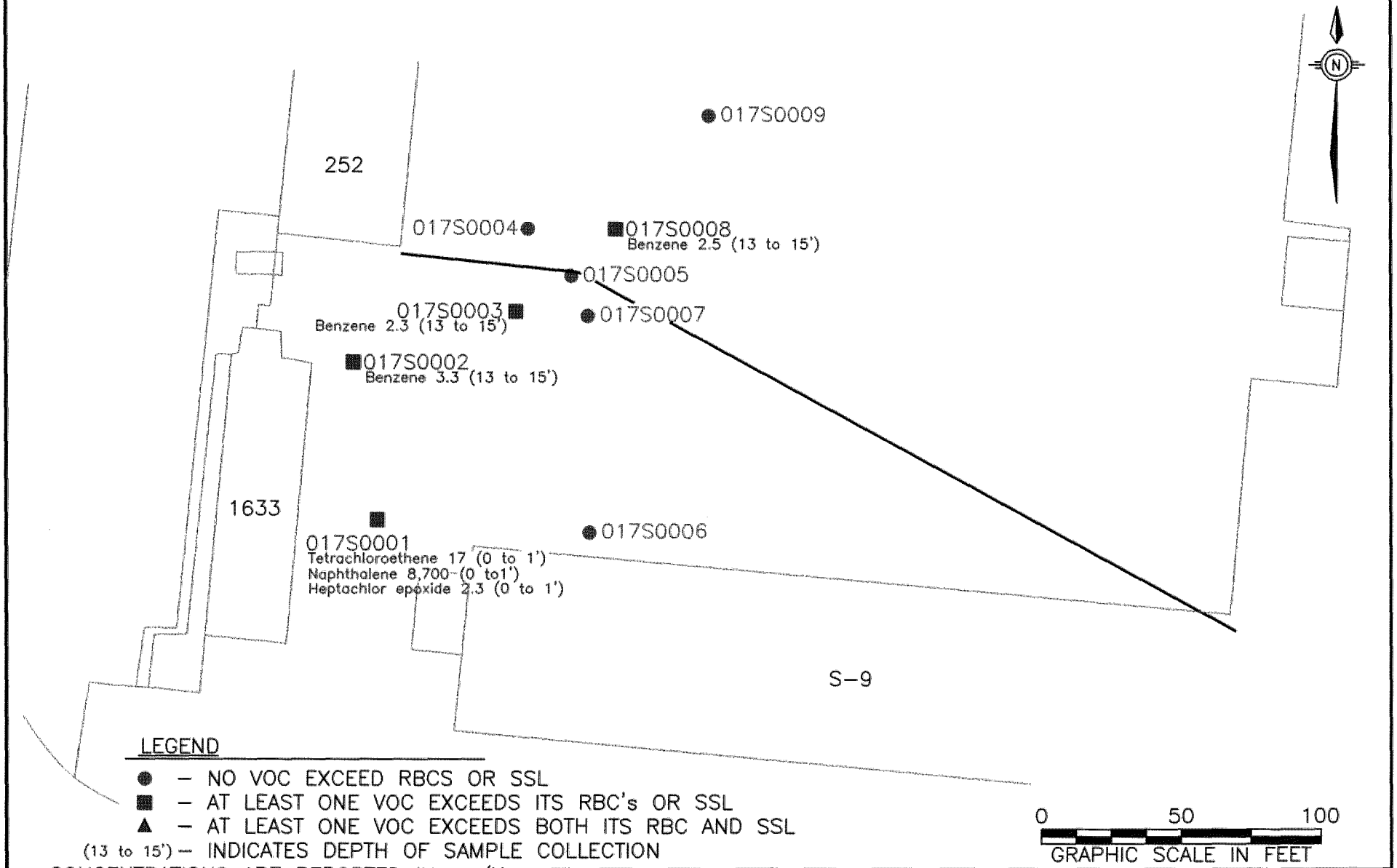
FIGURE 5.2
SWMU 17
FIELD SCREENING RESULTS FOR TPH IN SOIL
ALONG THE PIPE TRENCH

DWG DATE: 01/25/00 | DWG NAME: 0140R016



LEGEND

● – NO VOC EXCEED RBCS OR SSL

■ – AT LEAST ONE VOC EXCEEDS ITS RBC's OR SSL

▲ – AT LEAST ONE VOC EXCEEDS BOTH ITS RBC AND SSL

(13 to 15') – INDICATES DEPTH OF SAMPLE COLLECTION

CONCENTRATIONS ARE REPORTED IN μg/Kg.

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FIGURE 5.3
SWMU 17
RBC AND SSL EXCEEDANCES FOR ORGANICS IN SURFACE AND SUBSURFACE SOIL

DWG DATE: 02/04/00 | DWG NAME: 0141R017

Table 5.1

SWMU 17 — Results of TPH Field Screening

Soil Samples (ppm)

Location Number	Depth (in feet bls)	TPH Concentrations
017SN001	0 to 2	18
	2 to 3	158
	3 to 4	6
017ST001	2 to 3	3
	3 to 4	6
017SS001	2 to 3	5
	3 to 4	9
017SN002	2 to 3	3
	3 to 4	0
017ST002	2 to 3	18
	3 to 4	4
017SS002	0 to 2	15
	2 to 3	37
	3 to 4	10
017ST003	2 to 3	5
	3 to 4	0
017ST004	2 to 3	7
	3 to 4	3
017ST005	2 to 3	0
	3 to 4	1
017ST006	3 to 4	10
017ST007	3 to 4	5
017ST008	0 to 2	452
	2 to 3	7
	3 to 4	5
017SS008	2 to 3	64
	3 to 4	64
017SN008	2 to 3	77
	3 to 4	72
017ST009	2 to 3	0
	3 to 4	344
	4 to 5	7
	6 to 7	12
	7 to 8	1

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Table 5.1

SWMU 17 — Results of TPH Field Screening

Soil Samples (ppm)

Location Number	Depth (in feet bls)	TPH Concentrations
017SS009	3 to 4	2
017SN009	2 to 3	138
	3 to 4	63
017ST010	2 to 3	58
	3 to 4	63

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Table 5.2
SWMU 17 - Organics in Soil (μg/kg)

Parameter	Sampling Interval[a]	Frequency of Detection	Range of Detection[b]	Mean[c]	Residential Soil RBC[d]	Res. RBC Exceedances		Industrial Soil RBC[d]	Ind. RBC Exceedances		SSL[d]	SSL Exceeded[e]
VOCs												
Acetone	0 to 1	0/1	ND	NA	7.80E+06	N	0	2.00E+08	N	0	120	No
	13 to 15	5/9	15 - 50	30.2	NA		NA	NA		NA	120	No
Benzene	0 to 1	0/1	ND	NA	2.20E+04	C	0	2.00E+05	C	0	0.1	No
	13 to 15	3/9	2.3 - 3.3	2.7	NA		NA	NA		NA	0.1	Yes (017S0002, 017S0003, 017S0008)
Ethylbenzene	0 to 1	1/1	370	NA	7.80E+06	N	0	2.00E+08	N	0	750	No
	13 to 15	0/9	ND	NA	NA		NA	NA		NA	750	No
Styrene	0 to 1	1/1	31	NA	1.60E+07	N	0	4.10E+08	N	0	2900	No
	13 to 15	0/9	ND	NA	NA		NA	NA		NA	2900	No
Tetrachloroethene	0 to 1	1/1	17	NA	1.20E+04	C	0	1.10E+05	C	0	2.4	Yes (017S0001)
	13 to 15	1/9	1.6	NA	NA		NA	NA		NA	2.4	No
Toluene	0 to 1	1/1	140	NA	1.60E+07	N	0	4.10E+08	N	0	440	No
	13 to 15	0/9	ND	NA	NA		NA	NA		NA	440	No
Xylene (Total)	0 to 1	1/9	1,400	NA	1.60E+08	N	0	4.10E+09	N	0	8,500	No
	13 to 15	1/9	2	NA	NA		NA	NA		NA	8,500	No
SVOCs												
bis(2-Ethylhexyl)phthalate	0 to 1	0/1	ND	NA	4.60E+04	N	0	4.10E+05	N	0	140,000	No
	13 to 15	2/9	100 - 160	130	NA		NA	NA		NA	140,000	No
Diethylphthalate	0 to 1	0/1	ND	NA	6.30E+07	N	0	1.60E+09	N	0	23,000	No
	13 to 15	2/9	54 - 54	54	NA		NA	NA		NA	23,000	No
2-Methylnaphthalene	0 to 1	1/1	15,000	NA	3.10E+06	N	0	8.20E+07	N	0	1,100	No
	13 to 15	0/9	ND	NA	NA		NA	NA		NA	1,100	No
Naphthalene	0 to 1	1/1	8,700	NA	3.10E+06	N	0	8.20E+07	N	0	7.7	Yes (017S0001)
	13 to 15	0/9	ND	NA	NA		NA	NA		NA	7.7	No
Phenanthrene	0 to 1	1/1	1,100	NA	NL		0	NL		0	NL	No
	13 to 15	0/9	ND	NA	NA		NA	NA		NA	NL	No

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Table 5.2
SWMU 17 — Organics in Soil (ug/kg)

Parameter	Sampling Interval [a]	Frequency of Detection	Range of Detection [b]	Mean [c]	Residential Soil RBC [d]	Res. RBC Exceedances		Industrial Soil RBC [d]	Ind. RBC Exceedances		SSL [d]	SSL Exceeded [e]
Pesticides												
alpha-Chlordane	0 to 1	1/1	2.6	NA	1.80E+03	C	0	1.60E+04	C	0	46	No
	13 to 15	0/9	ND	NA	NA		NA	NA		NA	46	No
4,4'-DDD	0 to 1	1/1	3.8	NA	2.70E+03	C	0	2.40E+04	C	0	560	No
	13 to 15	0/9	ND	NA	NA		NA	NA		NA	560	No
4,4'-DDE	0 to 1	1/1	4.8	NA	1.90E+03	C	0	1.70E+04	C	0	1,800	No
	13 to 15	0/9	ND	NA	NA		NA	NA		NA	1,800	No
4,4'-DDT	0 to 1	1/1	2.4	NA	1.90E+03	C	0	1.70E+04	C	0	58	No
	13 to 15	0/9	ND	NA	NA		NA	NA		NA	58	No
Endosulfan II [f]	0 to 1	1/1	4.4	NA	4.70E+05	N	0	1.20E+07	N	0	980	No
	13 to 15	0/9	ND	NA	NA		NA	NA		NA	980	No
Endrin	0 to 1	1/1	5.6	NA	2.30E+04	N	0	6.10E+05	N	0	270	No
	13 to 15	0/9	ND	NA	NA		NA	NA		NA	270	No
Endrin aldehyde	0 to 1	1/1	2.3	NA	NL		0	NL		0	NL	No
	13 to 15	0/9	ND	NA	NA		NA	NA		NA	NL	No
Heptachlor epoxide	0 to 1	1/1	2.3	NA	7.00E+01	C	0	6.30E+02	C	0	1.2	Yes (017S0001)
	13 to 15	0/9	ND	NA	NA		NA	NA		NA	1.2	No
Total Petroleum Hydrocarbons [g]												
TRPH	0 to 1	0/1	ND	NA	NL		NA	NL		NA	NL	No
	13 to 15	6/9	66 - 320	159	NA		NA	NA		NA	NL	No

Notes:

a — Feet bls
b — Range lower limit is the lowest detected concentration.
c — Mean is based on detected concentrations only.
d — Residential and industrial screening values (RBC-Res., RBC-Ind.) are from the October 1999 Risk-Based Concentration Table (October 27, 1999, USEPA Region III memo).
e — A "Yes" in this column indicates that at least one sample result exceeded the SSL for this analyte; a "No" indicates no sample results exceeded the SSL.
f — The RBCs for endosulfan were used as a surrogate for endosulfan II.
g — A TPH cleanup level of 100 ppm has been established at this site for soil contamination less than 5 feet bls. A cleanup level of 1,000 ppm has been established for TPH contamination at depths greater than 5 feet bls.
NA — Not applicable
ND — Not Detected
NL — Not listed
"N" — noncarcinogen-based RBC
"C" — carcinogen-based RBC

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Xylene which was detected in one surface soil sample (1,400 μg/kg), and in one subsurface soil sample (2 μg/kg) did not exceed its RBCs or SSL.

The VOCs detected at this site are primarily petroleum constituents and solvents, which are indicative of a waste oil. However, all but acetone and benzene, were only detected in surface soil at location 017S0001, approximately 75 feet southwest of the former underground tank. The depth of the detections, and their distance from the tank, suggest that these compounds are not associated with a release from UWT S-9. It is more likely that these compounds were from a surface release.

Acetone, benzene, and xylene were detected in subsurface locations around the abandoned underground tank. Only benzene exceeded its SSL. Because benzene and xylene are petroleum constituents and their detections were at a location and depth close to the tank, it is likely that they resulted from a release at UWT S-9. Acetone is a common laboratory artifact and may have been introduced into the sample during its extraction or analysis.

Clean subsurface soil samples indicate that the contaminants most likely associated with UWT S-9 do not extend beyond approximately 75 feet from the source. Because only one surface soil sample was collected at the site, extent of those contaminants in the surface soil sample cannot be determined.

5.2.2 SWMU 17 — SVOCs in Soil

The following SVOCs were detected in surface and subsurface soil samples:

bis(2-Ethylhexyl)phthalate	2-Methylnaphthalene	Phenanthrene
Diethylphthalate	Naphthalene	

bis(2-Ethylhexyl)phthalate was not detected in the surface soil sample. It was detected in two subsurface soil samples at 100 μg/kg and 160 μg/kg, but neither exceeded the RBCs or SSL.

Diethylphthalate was not detected in the surface soil sample. It was detected in two subsurface soil samples, both at 54 μg/kg, but neither exceeded its SSL.

2-Methylnaphthalene was only detected in the surface soil sample at 15,000 μg/kg, and did not exceed its residential nor industiral RBC. It has no SSL.

Naphthalene exceeded its SSL of 7.7 μg/kg in sample 017S000101 at 8,700 μg/kg. No other semivolatile compound exceeded its RBCs or SSL.

Phenanthrene was detected in the surface soil sample at 1,100 μg/kg. It has no RBC or SSL.

2-Methylnaphthalene, naphthalene, and phenanthrene were detected in the surface soil only; therefore, they are probably unrelated to any release from the underground tank and may be from the asphalt pavement at the site. The fact that these compounds were not detected in subsurface samples suggests limited vertical migration.

Diethylphthalate and bis(2-ethylhexyl)phthalate were detected in subsurface soil in or near the former tank pit. While it is possible that these compounds resulted from a release at the tank, bis(2-ethylhexyl)phthalate is a common sampling and laboratory artifact and may have been introduced into the sample during sample collection, extraction or analysis. Furthermore, neither compound exceeded it's SSL, so it's extent should be minimal.

5.2.3 SWMU 17 — Pesticides in Soil

The following pesticides were detected in *surface* soil only:

alpha-Chlordane	4,4'-DDT	Endrin aldehyde
4,4'-DDD	Endosulfan II	Heptachlor epoxide
4,4'-DDE	Endrin	

As seen in Table 5.2 and Figure 5.3, none of the detected pesticides exceeded their residential or industrial RBCs or SSLs. The results for the surface soil sample in μg/kg are:

alpha-Chlordane	2.6	Endosulfan II	4.4
4,4'-DDD	3.8	Endrin	5.6
4,4'-DDE	4.8	Endrin aldehyde	2.3
4,4'-DDT	2.4	Heptachlor epoxide	2.3

Only heptachlor epoxide exceeded its SSL of 1.2 μg/kg in sample 017S0001. Because none of these compounds was detected in subsurface soil, it is unlikely that their presence is a result of the underground tank operations. These detections may have resulted from an isolated surface spill or normal applications. Because the SSL was not exceeded for any other compounds and they are inherently low in mobility, their vertical extent should be minimal.

5.2.4 SWMU 17 — TPH in Soil

TPH was not detected in the surface soil sample; however, it was detected in six of nine subsurface soil samples at concentrations ranging from 66 to 320 ppm. USEPA has not established an RBC or SSL for TPH. As stated in Section 5.0, two TPH cleanup levels apply to soil at NSA Mid-South; 100 ppm for contamination in soil less than 5 feet bls, and 1,000 ppm based on soil permeability. As seen in Figure 5.4, TPH concentrations exceed the

1,000 ppm cleanup level in five subsurface soil samples: 017S00115, 017S00215, 017S00305, 017S00715, and 017S00815.

TPH was detected in all but three locations. UWT S-9 is their most likely source. Extent to the north and south of the former tank pit has been defined by the nondetect results for sample locations 017S0006 and 017S0009. No clean samples were observed in locations east and west of the former pit.

As seen in Table 5.1 and Figure 5.2, TPH is present along the full length of the former pipe trench associated with UWT S-9, indicating releases at multiple locations along the pipe, probably from separated joints. The field screening identified four locations where the activity's100 ppm cleanup level was exceeded. Lateral extent of the detections is at least 5 feet from the center line of the trench and to depths of at least 8 feet in one location and to 4 feet in all other locations.

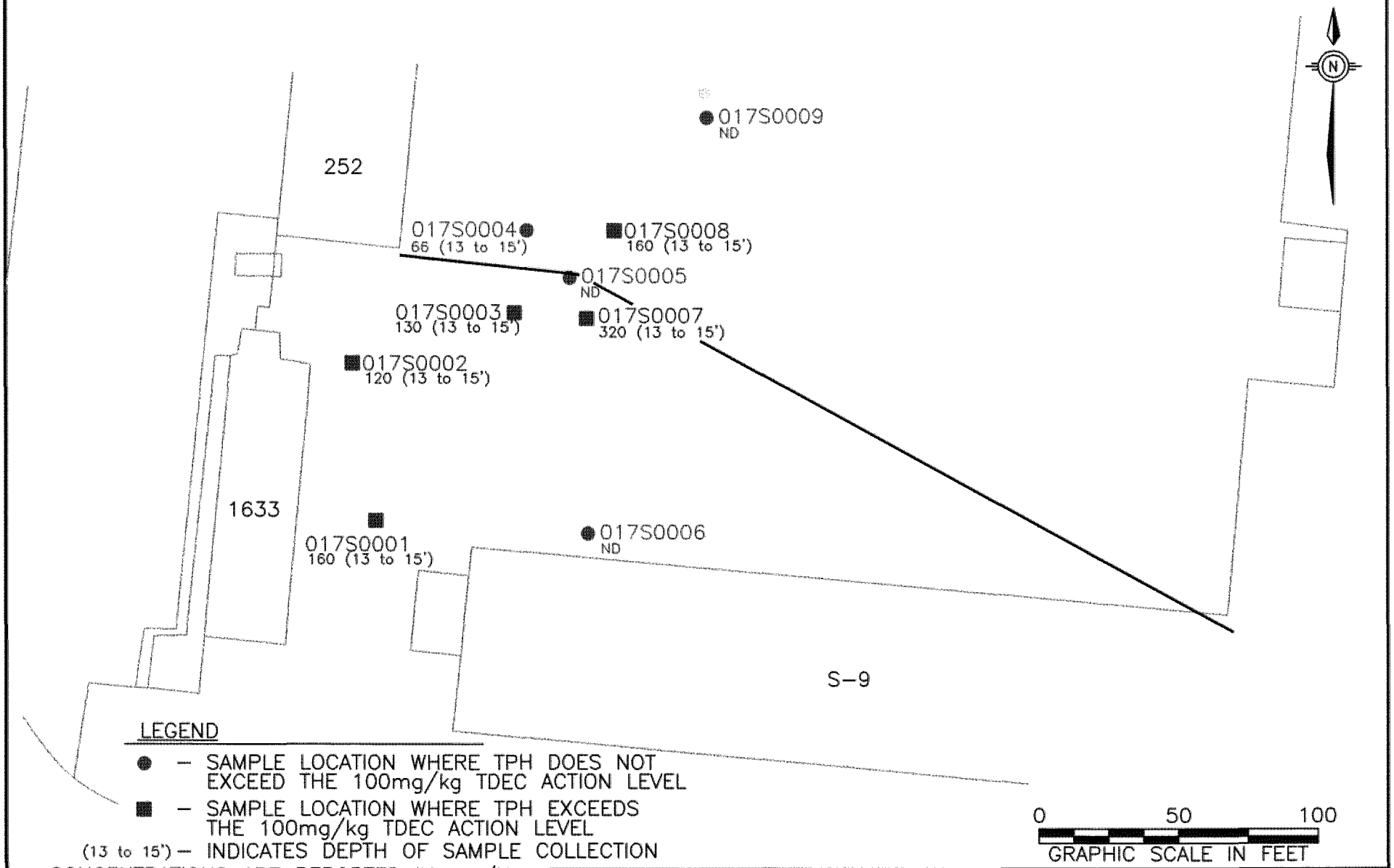
5.2.5 SWMU 17 — Inorganics in Soil

The following inorganics were detected soil at concentrations exceeding the background RC:

Antimony Nickel Selenium

The inorganic results are presented in Table 5.3 and Figure 5.5.

Antimony was detected in the surface soil sample 017S0001 at 9 mg/kg and in subsurface soil samples 017S000715 and 017S000815 at 0.58 and 0.51 mg/kg. All exceeded the background RC (nondetect in surface and subsurface background samples), but only surface soil sample 017S000101 exceeded its SSL (0.66 mg/kg).



LEGEND

● – SAMPLE LOCATION WHERE TPH DOES NOT EXCEED THE 100mg/kg TDEC ACTION LEVEL

■ – SAMPLE LOCATION WHERE TPH EXCEEDS THE 100mg/kg TDEC ACTION LEVEL

(13 to 15') – INDICATES DEPTH OF SAMPLE COLLECTION

CONCENTRATIONS ARE REPORTED IN mg/Kg.

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FIGURE 5.4
SWMU 17
TPH CONCENTRATIONS IN SOIL
EXCEEDING THE TDEC ACTION LEVEL

DWG DATE: 01/25/00 | DWG NAME: 0141R018

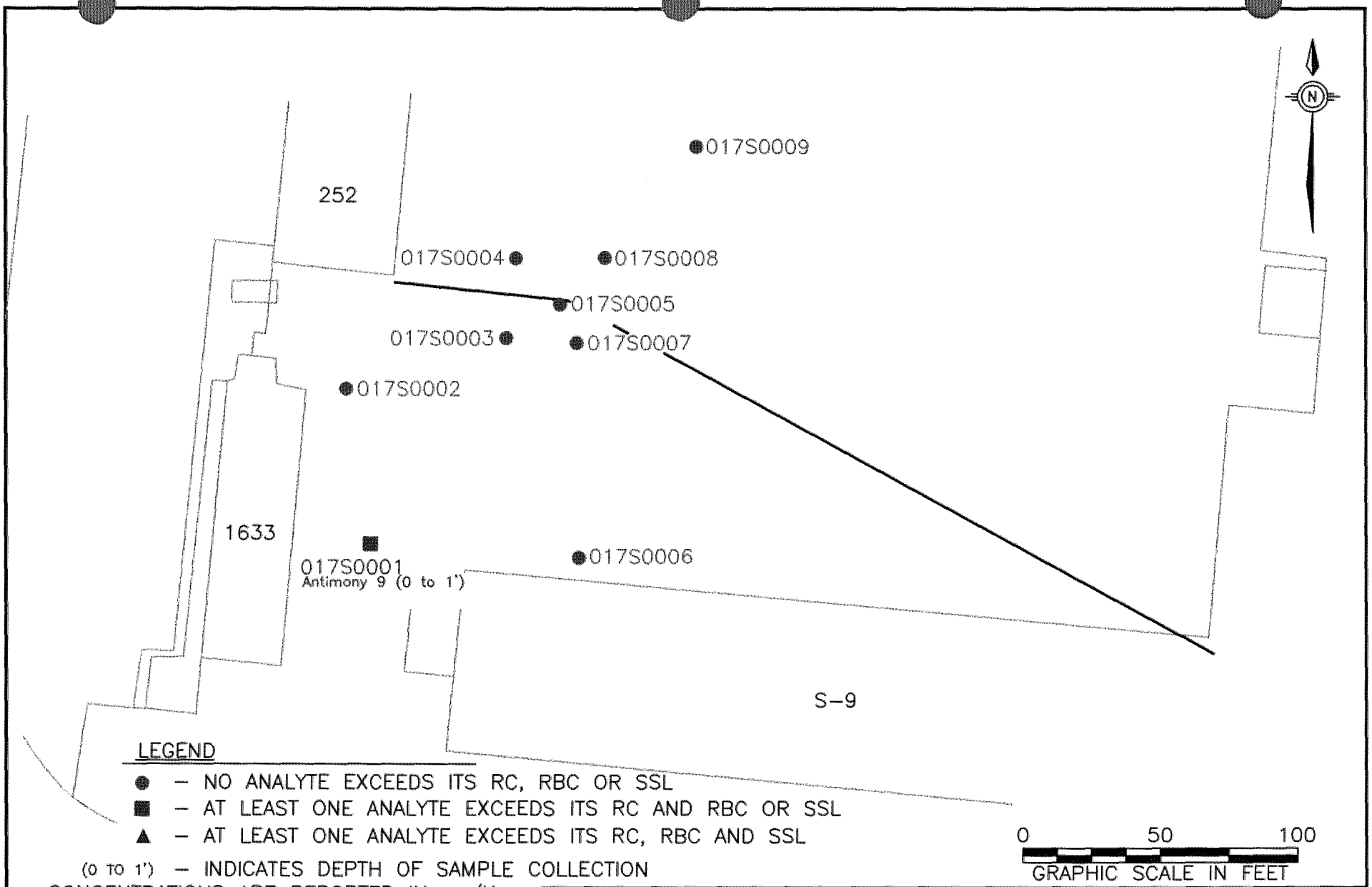

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FIGURE 5.5
SWMU 17
RC, RBC, AND SSL EXCEEDANCES FOR INORGANICS IN SURFACE AND SUBSURFACE SOIL

DWG DATE: 02/04/00 | DWG NAME: 0141R019

Nickel was detected in nine subsurface soil samples; 017S000115 (17.6 mg/kg), 017S000215 (13.9 mg/kg), 017S000315 (14.5 mg/kg), 017S000415 (13.2 mg/kg), 017S000515 (14.7 mg/kg), 017S000615 (18.6 mg/kg), 017S000715 (13.9 mg/kg), 017S000815 (16.3 mg/kg), and 017S000915 (16 mg/kg) all exceeding the RC (nondetect in subsurface soil). No SSL is listed for nickel.

Selenium was detected in subsurface sample 017S000315 at 0.62 mg/kg, exceeding its RC (nondetect in surface and subsurface background samples) but not its SSL (0.95 mg/kg). No other inorganics exceeded their RCs.

While all of these inorganics exceeded their background RCs (nondetect for all three), it is unlikely that they result from activities conducted at this SWMU. Due to the heterogeneity of the soil in at NSA Mid-South and the frequent use of fill during construction, it is probable that these elements were detected at ambient concentrations. Also, as reported in *Elements in North American Soil* (Dragun and Chiasson, 1991), these elements can be found in Tennessee soils in the following ranges of concentrations:

Antimony	<1.0 to 2.0 mg/kg
Nickel	5.0 to 70 mg/kg
Selenium	<0.1 to 1.1 mg/kg

5.2.6 SWMU 17 — Groundwater Sample Results

As outlined in Section 4, fluvial groundwater samples were collected from five locations and analyzed for SW-846 Method 8260. The VOC analysis served as an indicator parameter for petroleum-related compounds, and helped to determine whether chlorinated solvents are present from any UWT release. The results are summarized in Table 5.4 and Figure 5.6. The following VOCs were identified in groundwater at SWMU 17:

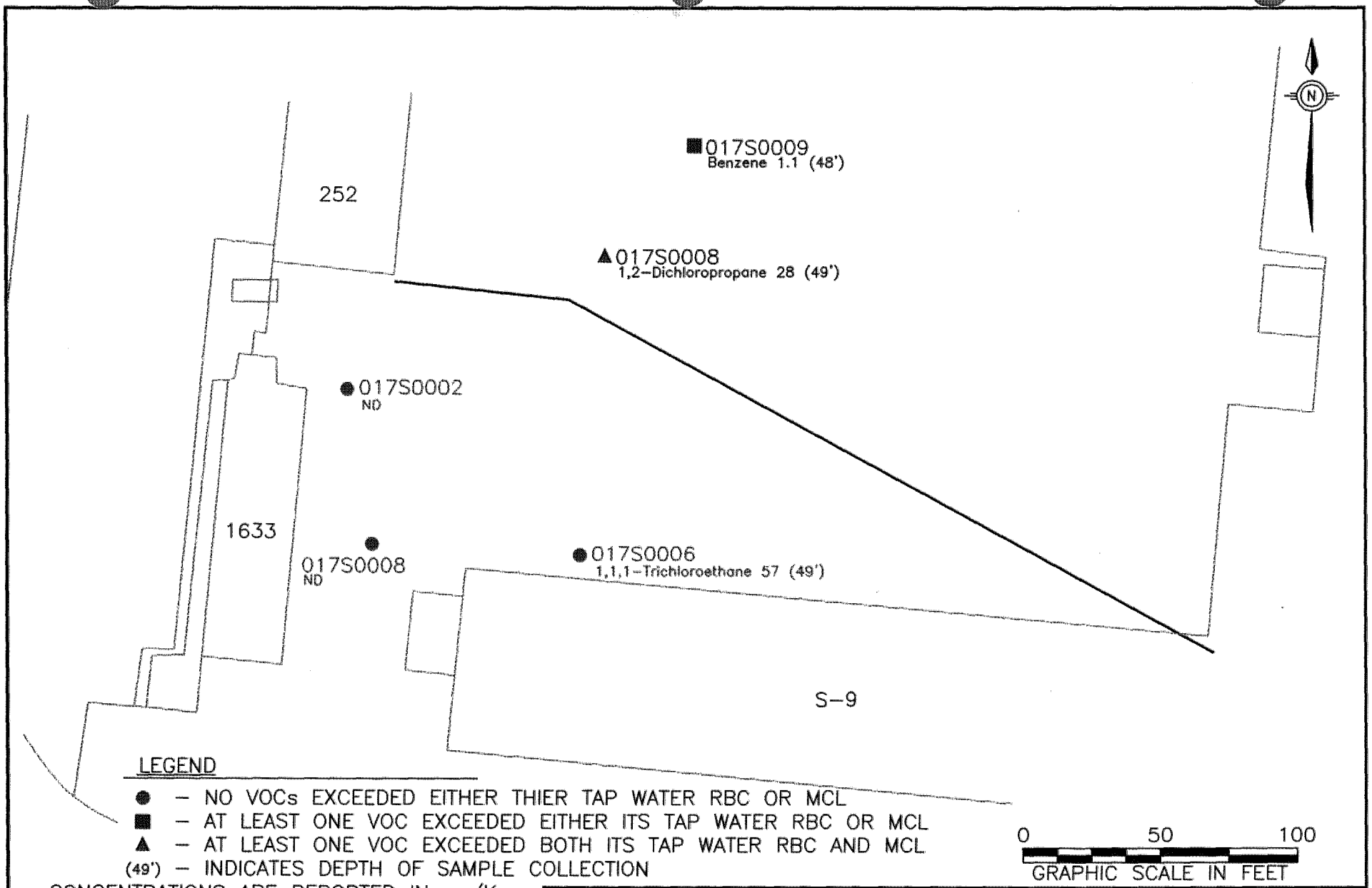
1,2-Dichloropropane Benzene 1,1,1-Trichloroethane

1,2-Dichloropropane was detected in sample 017G000549 at 28 μg/L, exceeding its tap water RBC of 0.16 μg/L and MCL of 5 μg/L.

Benzene was detected in sample 017G000948 at 1.1 μg/L, exceeding its tap water RBC of 0.36 μg/L. Benzene did not exceed its MCL.

1,1,1-Trichloroethane was detected in sample 017GG000649 at a concentration of 5.7 μg/L. Neither its tap water RBC nor MCL were exceeded.

The compounds detected in groundwater are petroleum and solvent-related and are likely constituents of waste oil. 1,2-Dichloropropane was detected in the immediate area of the former underground tank. Surrounding groundwater locations that were nondetect for 1,2-dichloropropane suggest that this compound does not extend far from the immediate area of the the former tank.



LEGEND

● – NO VOCs EXCEEDED EITHER THIER TAP WATER RBC OR MCL
■ – AT LEAST ONE VOC EXCEEDED EITHER ITS TAP WATER RBC OR MCL
▲ – AT LEAST ONE VOC EXCEEDED BOTH ITS TAP WATER RBC AND MCL
(49') – INDICATES DEPTH OF SAMPLE COLLECTION

CONCENTRATIONS ARE REPORTED IN $\mu g/Kg$.

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FIGURE 5.6
SWMU 17
TAP WATER RBC AND MCL
EXCEEDANCES FOR VOCs IN
FLUVIAL DEPOSITS GROUNDWATER

DWG DATE: 01/25/00 | DWG NAME: 0140R020

Table 5.3
SWMU 17 — Inorganics in Soil (Results in mg/kg)

Parameter	Sampling Interval [a]	Frequency of Detection	Range of Detection [b]	Mean [c]	Inorganic RC [d]	RC Exceedances	Residential Soil RBC [e]		RBC-Res. Exceedances	Industrial Soil RBC [e]		RBC-Ind. Exceedances	SSL [e]	SSL Exceeded [f]
Antimony	0-1	1/1	9	NA	ND	1 (017S0001)	3.10E+01	N	0	8.20E+02	N	0	0.66	Yes (017S0001)
	13-15	2/9	0.51 - 0.58	0.55	ND	2 (017S0007, 017S0008)	NA		NA	NA		NA	0.66	No
Arsenic	0-1	1/1	2.5	NA	14.58	0	4.30E-01	C	1 (017S0001)	3.8	C	0	1.3E-3	Yes (017S0001)
	13-15	9/9	2.4 - 9.5	5.1	20.32	0	NA		NA	NA		NA	1.3E-3	Yes (017S0001, 017S0002,017S0003, 017S0004, 017S0005, 017S0006, 017S0007, 017S0008, 017S0009)
Barium	0-1	1/1	108	NA	223.46	0	5.50E+03	N	0	1.40E+05	N	0	110	No
	13-15	9/9	48.5 - 101	68	265.12	0	NA		NA	NA		NA	110	No
Beryllium	0-1	1/1	0.45	NA	1	0	1.60E+02	C	0	4.10E+03	C	0	58	No
	13-15	4/9	0.39 - 0.54	0.45	1	0	NA		NA	NA		NA	58	No
Cadmium	0-1	1/1	2.8	NA	1.54	0	3.90E+01	N	0	1.00E+03	N	0	NL	Yes (017S0001)
	13-15	3/9	0.06 - 0.21	0.12	3.24	0	NA		NA	NA		NA	NL	No
Chromium	0-1	1/1	10.9	NA	23.89	0	230 [g]	N	0	6100 [g]	N	0	2.1 [g]	Yes (017S0001)
	13-15	9/9	10.3 - 16.3	12.4	28.28	0	NA		NA	NA		NA	2.1 [g]	Yes (017S0001, 017S0002, 017S0003, 017S0004, 017S0005, 017S0006, 017S0007, 017S0008, 017S0009)
Cobalt	0-1	1/1	8	NA	15.98	0	4.70E+03	N	0	1.20E+05	N	0	NL	No
	13-15	9/9	3.3 - 7.1	5.9	14.36	0	NA		NA	NA		NA	NL	No
Copper	0-1	1/1	19.5	NA	24.19	0	3.10E+03	N	0	8.20E+04	N	0	530	No
	13-15	9/9	12.5 - 17.3	14.7	32.52	0	NA		NA	NA		NA	530	No
Lead	0-1	1/1	14.4	NA	26.03	0	400 [h]		0	1,000 [h]		0	400 [h]	No
	13-15	9/9	7.3 - 9.5	8.3	19.8	0	NA		NA	NA		NA	400 [h]	No
Mercury	0-1	0/1	ND	NA	ND	NA	NL		0	NL		0	NL	No
	13-15	9/9	0.01 - 0.04	0.02	0.176	0	NA		NA	NA		NA	NL	No
Nickel	0-1	1/1	18.8	NA	20.62	0	1.60E+03	N	0	4.10E+04	N	0	NL	No
	13-15	9/9	13.2 - 18.6	15.4	ND	9 (017S0001, 017S0002, 017S0003, 017S0004, 017S0005, 017S0006, 017S0007, 017S0008, 017S0009)	NA		NA	NA		NA	NL	No
Selenium	0-1	1/1	ND	NA	ND	0	3.90E+02	N	NA	1.00E+04	N	NA	0.95	No
	13-15	1/9	0.62	0.62	ND	1 (017S0003)	NA		NA	NA		NA	0.95	No
Tin	0-1	1/9	25.4	NA	33.56	0	4.70E+04	N	0	1.20E+06	N	0	NL	No
	13-15	0/9	ND	NA	ND	0	NA		NA	NA		NA	NL	No
Vanadium	0-1	1/1	21.6	NA	45.11	0	5.50E+02	N	0	1.40E+04	N	0	260	No
	13-15	9/9	15.6 - 23.6	18.9	43.68	0	NA		NA	NA		NA	260	No
Zinc	0-1	1/1	55.7	NA	98	0	2.30E+04	N	0	6.10E+05	N	0	680	No
	13-15	9/9	35.6 - 64.1	45.3	109	0	NA		NA	NA		NA	680	No

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Notes:

a	—	Feet bls
b	—	Range lower limit is the lowest detected concentration.
c	—	Mean is based on detected parameter concentrations only.
d	—	Background reference concentration (2X mean background). Section 3 of this report discusses RCs.
e	—	Residential and industrial screening values (RBC-Res., BC-Ind.) are from the *Risk-Based Concentration Table* (October 27, 1999).
f	—	A "Yes" in this column indicates that at least one sample result exceeded the SSL for this analyte; a "No" indicates no sample results exceeding the SSL.
g	—	Risk-based data for hexavalent chromium (VI).
h	—	Value is soil cleanup level for total lead (USEPA OSWER Directive, 9355.4-12).
NA	—	Not applicable
"N"	—	noncarcinogen-based RBC
"C"	—	carcinogen-based RBC
ND	—	Not Detected

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Table 5.4
SWMU 17 — VOCs Detected in Fluvial Deposits
Groundwater Screening Samples (μg/kg)

Parameter	Sample Interval[a]	Frequency of Detection	Range of Detection[b]	Mean[c]	Tap Water RBC		Tap Water RBC Exceedances	MCL	MCL Exceedances
1,1,1-Trichloroethane	49	1/5	5.7	NA	5.40E+02	N	0	200	0
1,2-Dichloropropane	49	1/5	28	NA	1.60E-01	C	1 (017G0005)	5	1 (017G0005)
Benzene	48	1/5	1.1	NA	3.60E-01	C	1 (017G0009)	5	0

Notes:

a — Feet bls
b — Range lower limit is the lowest detected concentration.
c — Mean is based on detected concentrations only.
d — Residential and industrial screening values (RBC-Res. and RBC-Ind.) are from the October 1999 Risk-Based Concentration Tables, (October 27, 1999 USEPA Region III RBC memorandum).
e — MCL values are from the October 1996 Drinking Water Regulations and Health Advisories Table (October 1999, USEPA).
C — Carcinogen
N — Noncarcinogen
NL — Not Listed
ND — Not Detected
NA — Not Applicable

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Benzene and 1,1,1-trichloroethane are present in one sample location each, suggesting limited extent. However, vertical extent cannot be determined for any of the compounds because only one depth interval was sampled in the fluvial deposits.

5.3 SWMU 19 — Analytical Results

Seven locations were sampled at SWMU 19. Soil samples were collected at six of the seven locations. Surface samples (0 to 1 foot bls) were collected at two locations (019S0001 and 019S0002) and subsurface samples (13 to 15 feet bls) were collected at 4 locations (019S0003, 019S0004, 019S0005, and 019S0006). Soil samples were analyzed for VOCs, SVOCs, pesticides, and metals. Groundwater samples were collected from the fluvial deposits at three locations (019G0001, 019G0002, and 019G0007) and analyzed for VOCs as an indicator parameter to detected petroleum related compounds (e.g., benzene, toluene, ethylbenzene).

5.3.1 SWMU 19 — VOCs in Soil

The following VOCs were detected in soil samples analyzed at the offsite laboratory by SW-846 Method 8260:

Acetone	Carbon Disulfide	Styrene
Methyl Ethyl Ketone	Ethylbenzene	Toluene
Benzene	4-Methyl-2-Pentanone	Xylene (total)

Table 5.5 and Figure 5.7 summarize the detected VOCs in surface and subsurface soil samples analyzed at the offsite laboratory. As shown in Table 5.5, no compound exceeded its residential or industrial RBC.

Acetone was detected in surface sample 019S000201 at 330 μg/kg exceeding its SSL of 120 μg/kg. It was detected in four subsurface samples: 019S000315, 019S000415, 019S000515

and 019S000615 at concentrations ranging from 45 to 220 μg/kg. Its SSL was exceeded in 019S000415 and 019S000615.

Benzene exceeded its SSL (0.1 μg/kg) in two surface samples (019S000101 and 019S000201) at 63 and 250 μg/kg.

Carbon disulfide was not detected in surface soil. It was detected in subsurface sample 019S000615 at 1.7 μg/kg, which does not exceed its RBCs or SSL.

Ethylbenzene exceeded its SSL (750 μg/kg) in sample 019S0001 at 1,800 μg/kg. It did not exceed it's residential or industrial RBC.

Methyl ethyl ketone (MEK) was detected in surface soil sample 019S000201 at 56 μg/kg and in subsurface soil sample 019S000615 at 15 μg/kg. MEK did not exceed its RBCs or SSL.

4-Methyl-2-pentanone was detected in surface soil sample 019S000201 at 20 μg/kg. It was detected in subsurface soil sample 019S000615 at 13 μg/kg. Neither detection exceeds the compounds' RBCs or SSL.

Styrene was detected in surface soil sample 019S000201 at 15 μg/kg, which does not exceed its RBCs or SSL. It was not detected in any subsurface soil sample.

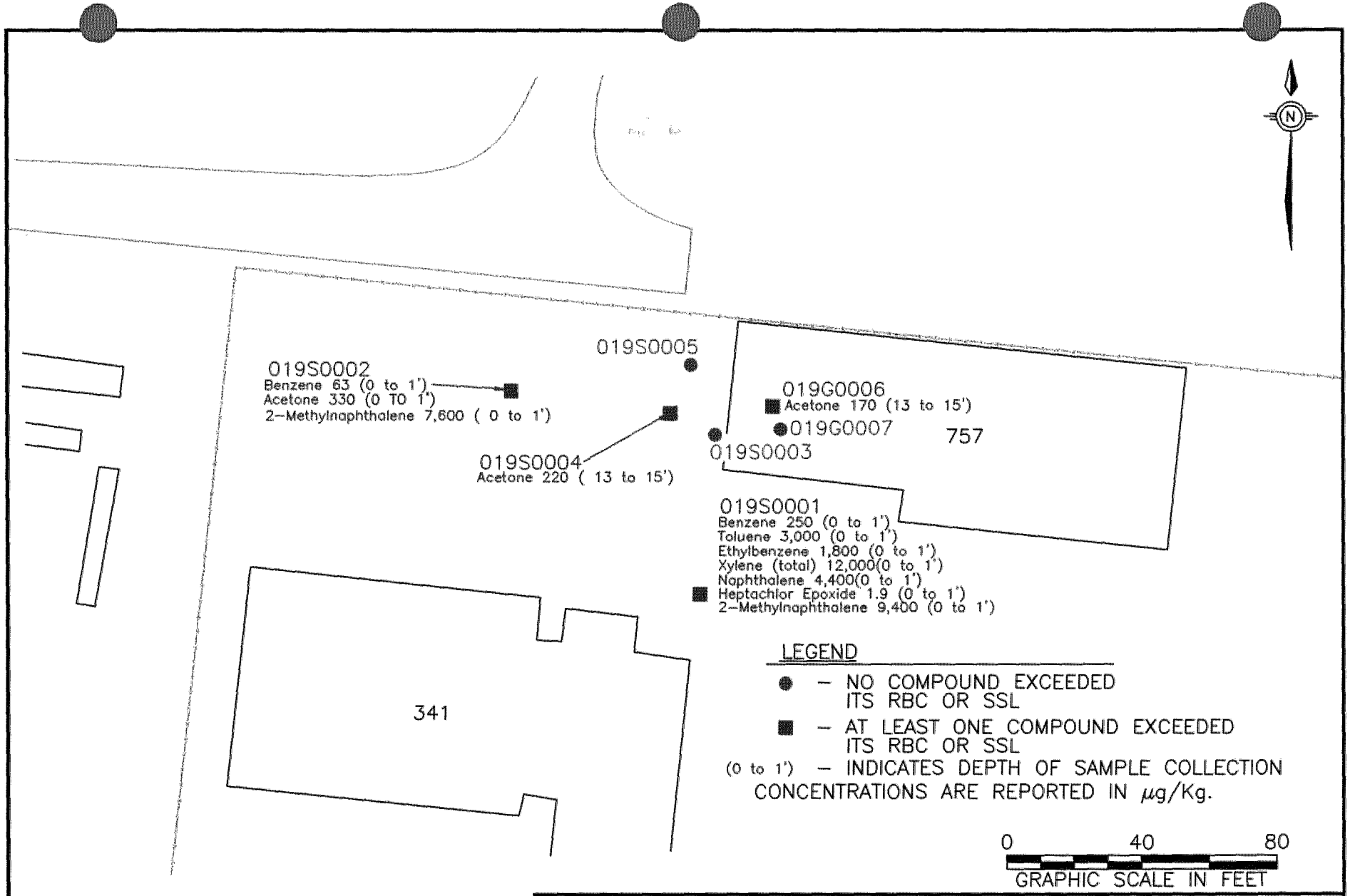

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FIGURE 5.7
SWMU 19
RBC AND SSL EXCEEDANCES FOR ORGANICS IN SURFACE AND SUBSURFACE SOIL

DWG DATE: 02/04/00 | DWG NAME: 0141R023

Table 5.5
SWMU 19 — Organics in Soil (μg/kg)

Parameter	Sampling Interval [a]	Frequency of Detection		Range of Detection [b]		Mean [c]	Residential Soil RBC [d]		RBC-Res. Exceedances	Industrial Soil RBC [d]		RBC-Ind. Exceedances	SSL [d]	SSL Exceeded [e]
VOCs														
Acetone	0-1'	1/2		330		NA	7.80E+06	N	0	2.00E+08	N	0	120	Yes (019S000201)
	13-15'	4/4	45	-	220	132.5	NA		NA	NA		NA	120	Yes (019S000415, 019S000615)
MEK	0-1'	1/2		56		NA	4.70E+07	N	0	1.20E+09	N	0	400	No
	13-15'	1/4		15		NA	NA		NA	NA		NA	400	No
Benzene	0-1'	2/2	63	-	250	156.5	2.20E+04	C	0	2.00E+05	C	0	0.1	Yes (019S0001, 019S002)
	13-15'	0/4		ND		NA	NA		NA	NA		NA	0.1	No
Carbon disulfide	0-1'	0/2		ND		NA	7.80E+06	N	0	2.00E+08	N	0	950	No
	13-15'	1/4		1.7		NA	NA		NA	NA		NA	950	No
Toluene	0-1'	2/2	190	-	3,000	1,595	1.60E+07	N	0	4.10E+07	N	0	440	Yes (019S0001)
	13-15'	1/4		1.7		NA	NA		NA	NA		NA	440	No
4-Methyl-2-Pentanone	0-1'	1/2		20		NA	6.30E+06	N	0	1.60E+08	N	0	NL	No
	13-15'	1/4		13		NA	NA		NA	NA		NA	NL	No
Ethylbenzene	0-1'	2/2	280	-	1,800	1,040	7.80E+06	N	0	2.00E+08	N	0	750	Yes (019S0001)
	13-15'	0/4		ND		NA	NA		NA	NA		NA	750	No
Styrene	0-1'	1/2		15		NA	1.60E+07	N	0	4.10E+08	N	0	2,900	No
	13-15'	0/4		ND		NA	NA		NA	NA		NA	2,900	No
Xylenes (total)	0-1'	2/2	1,600	-	12,000	6,800	1.60E+08	N	0	4.10E+09	N	0	8,500	Yes (019S0001)
	13-15'	0/4		ND		NA	NA		NA	NA		NA	8,500	No
SVOCs														
bis(2-ethylhexyl)phthalate	0-1'	2/2	1,600	-	1,800	1700	4.60E+04	N	0	4.10E+05	N	0	140,000	No
	13-15'	3/4	78	-	190	117	NA		NA	NA		NA	140,000	No
Chrysene	0-1'	0/2		ND		NA	8.7E+4	C	NA	7.8E+5	C	NA	7,300	No
	13-15'	1/4		30		NA	NA		NA	NA		NA	7,300	No
Naphthalene	0-1'	2/2	3,600	-	4,400	4,000	1.6E+7	N	NA	4.1E+8	N	NA	7.7	Yes (019S0001, 019S0002)
	13-15'	0/4		ND		NA	NA		NA	NA		NA	7.7	No
2-Methylnapthalene	0-1'	2/2	7,600	-	9,400	8,500	1.6E+7	N	NA	4.1E+8	N	NA	1,100	Yes (019S0001, 019S0002)
	13-15'	0/4		ND		NA	NA		NA	NA		NA	1,100	No
Phenanthrene	0-1'	0/2		ND		NA	NL		NA	NL		NA	NL	No
	13-15'	1/4		56		NA	NA		NA	NA		NA	NL	No
Pyrene	0-1'	0/2		ND		NA	2.30E+06	C	0	6.10E+07	C	0	34,000	No
	13-15'	2/4	28	-	87	57.5	NA		NA	NA		NA	34,000	No
Pesticides														
Heptachlor	0-1'	1/2		2.8		NA	1.40E+02	C	0	1.30E+03	C	0	42	No
	13-15'	1/4		0.3		NA	NA		NA	NA		NA	42	No
4,4'-DDE	0-1'	1/2		5.6		NA	1.90E+03	C	0	1.70E+04	C	0	1,800	No
	13-15'	0/4		ND		NA	NA		NA	NA		NA	1,800	No
4,4'-DDT	0-1'	1/2		4.8		NA	1.90E+03	C		1.70E+04	C	0	58	No
	13-15'	0/4		ND		NA	NA		NA	NA		NA	58	No
Endosulfan II [g]	0-1'	2/2	4	-	7.7	6	4.70E+05	N	0	1.20E+07	N	0	980	No
	13-15'	0/4		ND		NA	NA		NA	NA		NA	980	No
Heptachlor epoxide	0-1'	1/2		1.9		NA	7.00E+01	C	0	6.30E+02	C	0	1.2	Yes (019S000101)
	13-15'	0/4		ND		NA	NA		NA	NA		NA	1.2	No

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Table 5.5
SWMU 19 - Organics in Soil (μg/kg)

Parameter	Sampling Interval [a]	Frequency of Detection	Range of Detection [b]	Mean [c]	Residential Soil RBC [d]	RBC-Res. Exceedances	Industrial Soil RBC [d]	RBC-Ind. Exceedances	SSL [d]	SSL Exceeded [e]
Total Petroleum Hydrocarbons (ppm) [g]										
TPH	0-1'	0/2	ND	NA	NL	NA	NL	NA	NL	NA
	13-15'	3/4	120 - 4,600	1,820	NL	NA	NL	NA	NL	NA

Notes:

a — Feet bls
b — Range lower limit is the lowest detected concentration.
c — Mean is based on detected concentrations only.
d — Residential and industrial screening values (RBC-Res., RBC-Ind.) are from the October 1999 Risk-Based Concentration Table (October 27, 1999, USEPA Region III memo).
e — A "Yes" in this column indicates that at least one sample result exceeded the SSL for this analyte; a "No" indicates no sample results exceeded the SSL.
f — The RBCs for endosulfan were used as a surrogate for endosulfan II.
g — A TPH cleanup level of 100 ppm has been established at this site for soil contamination less than 5 feet bls. A cleanup level of 1,000 ppm has been established for TPH contamination at depths greater than 5 feet bls.
NA — Not applicable
ND — Not Detected
NL — Not listed
"N" — noncarcinogen-based RBC
"C" — carcinogen-based RBC

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Toluene exceeded its SSL (440 μg/kg) in sample 019S0001 at 3,000 μg/kg. It did not exceed its residential or industrial RBC.

Xylene exceeded its SSL (8,500 μg/kg) in surface soil sample 019S0001 at 12,000 μg/kg. It did not exceed its residential or industrial RBC.

Most of the VOCs detected are petroleum or solvent-related compounds, as would be expected in waste oil. Benzene, toluene, ethylbenzene, and xylene, exceeded their SSLs in surface soil, but were not detected in groundwater. In addition, styrene and 4-methyl-2-pentanone were only detected in surface soil, but they did not exceed their SSLs or RBCs. Because these compounds were not detected in subsurface soil, it is unlikely that they came from the underground tank. Benzene, toluene, ethylbenzene, and xylene may have come from the asphalt pavement.

Acetone and carbon disulfide were detected in subsurface soil, but none of the detections exceeded their RBCs or SSLs. Acetone was detected in three locations around the tank. Both acetone and carbon disulfide were detected beneath Building N-757. While the locations of these detections suggest they may have come from the underground tank and piping, both compounds are common laboratory artifacts that may have been introduced into the sample during extraction or analysis.

5.3.2 SWMU 19 — SVOCs Detected in Soil

The following SVOCs were detected in surface and subsurface soil samples:

bis(2-Ethylhexyl)phthalate	Chrysene	2-Methylnaphthalene
Naphthalene	Phenanthrene	Pyrene

As seen in Table 5.5 and Figure 5.7, no semivolatile exceeded residential or industrial RBCs, and only naphthalene exceeded its SSLs.

bis(2-Ethylhexyl)phthalate was detected in surface soil samples 019S000101 and 019S000201 at 1,800 μg/kg and 1,600 μg/kg. It was detected in three subsurface soil samples: 019S000415, 019S000515, and 019S000615 at concentrations ranging from 78 μg/kg to 190 μg/kg. No detection exceeded either RBC or the SSL.

Chrysene was not detected in any surface soil sample. It was detected in subsurface soil sample 019S000415 at 30 μg/kg which, does not exceed either RBC or the SSL for chrysene.

2-Methylnaphthalene was detected in both surface soil samples: 019S000101 (9,400 μg/kg)and 019S000201(7,600 μg/kg). It was not detected in any subsurface soil sample. Neither surface soil detection exceeded any screening criteria.

Naphthalene was detected in samples 019S000101 at 4,400 μg/kg and 019S000201 at 3,600 μg/kg, both exceeding its SSL (97.7 μg/kg). Naphthalene was not detected in any subsurface soil sample.

Phenanthrene was not detected in either surface soil sample. It was detected in one subsurface soil sample (019S000415) at 56 μg/kg. No SSL is listed for phenanthrene.

Pyrene was not detected in either surface soil sample. It was detected in two subsurface soil samples: 019S000415 (87 μg/kg) and 019S000515 (28 μg/kg). Neither exceeded its SSL (34,000 μg/kg)

bis(2-Ethylhexyl)phthalate, 2-methylnaphthalene, and naphthalene were detected in surface soil at locations 019S0001 and 019S0002; therefore they are probably unrelated to the release from UWT N-757. bis(2-ethylhexyl)phthalate was also detected in three subsubsurface locations near the underground tank. While it is possible that these detections are related to the release,

bis(2-ethylhexyl)phthalate is a common sampling and laboratory artifact that could have been introduced into the sample during collection, extraction, or analysis. Chrysene, phenanthrene and pyrene were all detected in subsurface soil samples collected near the tank pit and are probably related to the release. No SVOCs were detected beneath Building N-757.

5.3.3 SWMU 19 — Pesticides in Soil

The following pesticides were detected in soil samples at SWMU 19:

4,4'-DDE	Endosulfan II	Heptachlor epoxide
4,4'-DDT	Heptachlor	

As seen on Table 5.5, none exceeded its RBCs. Only heptachlor epoxide exceeded its SSL of 1.2 μg/kg. It was detected in surface soil sample 019S000101 at a concentration of 1.9 μg/kg.

Except for heptachlor, none of these compounds was detected in subsurface soil, so it is unlikely that they are from a release from UWT-757. The detections in surface soil may be from a surface spill or normal application. Heptachlor may have been disposed of in the underground tank and subsequently been released into the soil.

5.3.4 SWMU 19 — TPH in Soil

TPH was not detected in the surface soil sample. It was detected in three of four subsurface soil samples from 120 to 4,600 ppm, exceeding its 1,000 ppm cleanup level in only one location (Figure 5.8). One detection was in a sample collected from beneath Building N-757.

No petroleum-related compounds were detected in the groundwater samples analyzed for VOCs, indicating that the TPH detected in soil has not impacted groundwater.

5.3.5 SWMU 19 — Inorganics in Soil

The following inorganics were detected in soil at concentration exceeding background RCs:

Selenium Tin Zinc

As previously outlined, detected concentrations of inorganics have been compared to their background RCs (all soil samples), RBCs (surface soil only), and SSLs (all soil samples). As shown on Table 5.6 and Figure 5.9, none of these inorganics exceeded its RBCs or SSLs.

Selenium was detected in surface sample 019S000101 at 0.37 mg/kg, which exceeds its RC (nondetect in surface and subsurface background samples), but not its SSL (0.95 mg/kg).

Tin was detected in surface soil samples 019S000101 and 019S000201 at 21.3 and 37.6 μg/kg, with sample 019S000201 exceeding its RC (33.56 μg/kg), but not its SSL or RBC.

Zinc was detected in surface soil samples 019S000101 and 019S000201 at 836 μg/kg and 166 μg/kg, both exceeding the RC for zinc (98 μg/kg). Neither exceeded its SSL.

While these inorganics did exceed their background RCs, these conentrations may represent ambient soil concentrations because of the heterogeneity of the soil and frequent use of fill during construction.

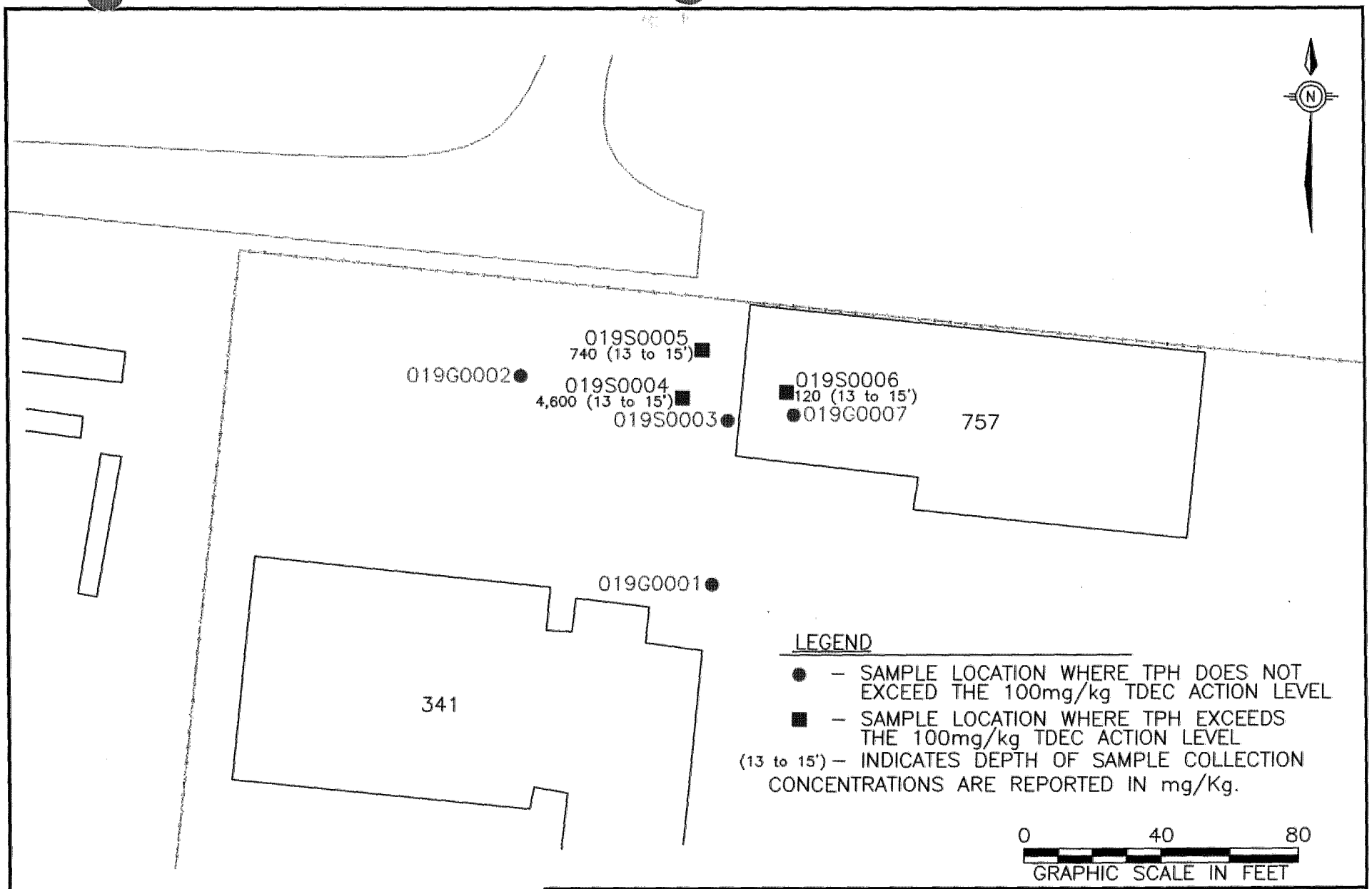

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FIGURE 5.8
SWMU 19
TPH CONCENTRATIONS IN SOIL
EXCEEDING THE TDEC ACTION LEVEL

DWG DATE: 01/25/00 | DWG NAME: 0140R021

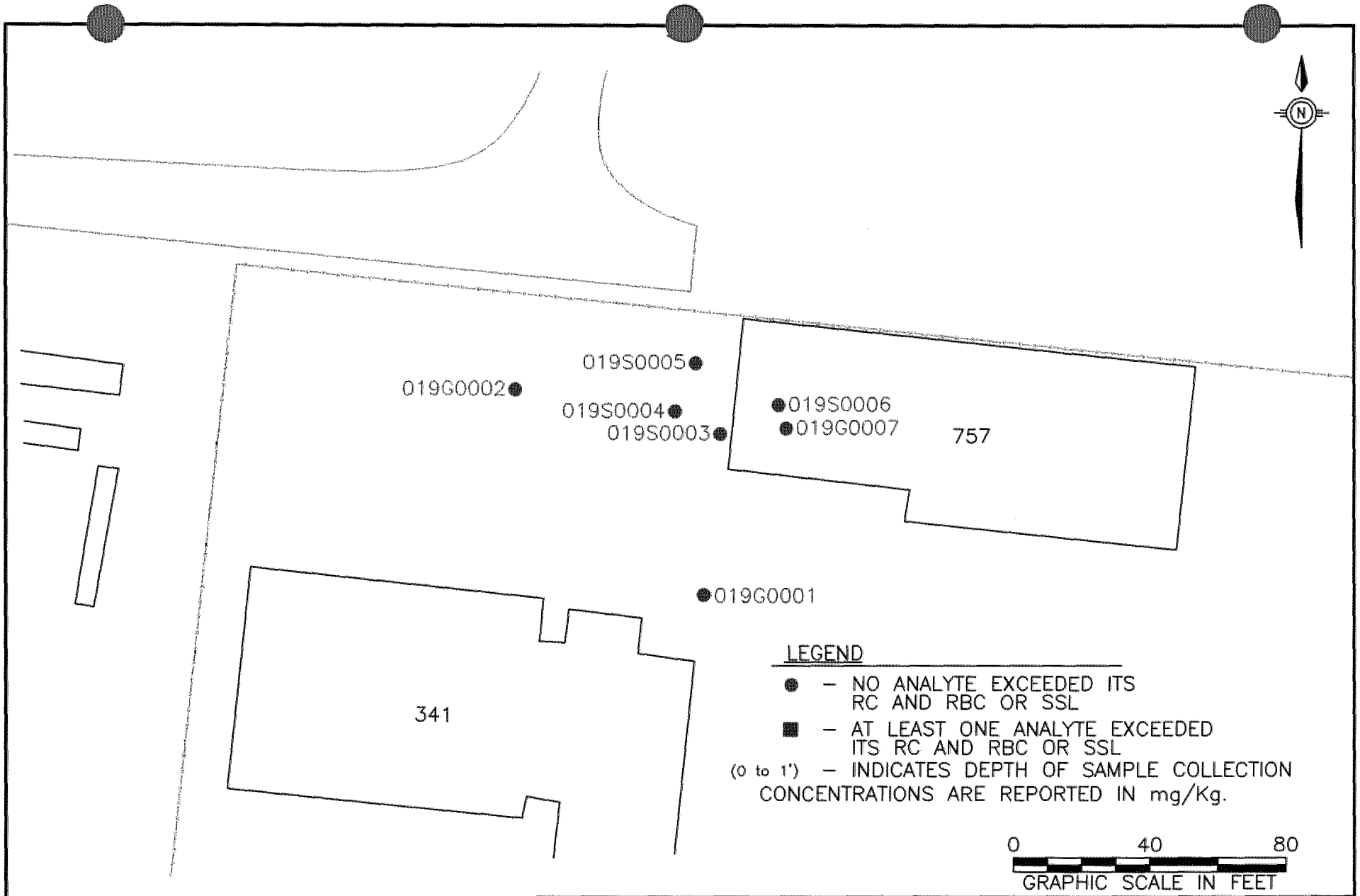

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FIGURE 5.9
SWMU 19
RC, RBC AND SSL EXCEEDANCES
FOR INORGANICS IN SURFACE
AND SUBSURFACE SOIL

DWG DATE: 01/25/00 | DWG NAME: 0141R022

Table 5.6
SWMU 19 — Inorganics in Soil (mg/kg)

Parameter	Sampling Interval [a]	Frequency of Detection	Range of Detection [b]	Mean [c]	Inorganic RC [d]	RC Exceedances	Residential Soil RBC [e]		RBC-Res. Exceedances	Industrial Soil RBC [e]		RBC-Ind. Exceedances	SSL [e]	SSL Exceeded [f]
Arsenic	0-1'	2/2	5.5 - 6.2	5.85	14.58	0	0.43	C	2 (019S001, 019S002)	3.8	C	2 (019S001, 019S002)	1.3E-3	Yes (019S0001, 019S0002)
	13-15'	4/4	7.1 - 11.1	8.85	20.32	0	NA		NA	NA		NA	1.3E-3	Yes (019S0003, 019S0004, 019S0005, 019S0006)
Barium	0-1'	2/2	141 - 172	156.5	223.46	0	5,500	N	0	140,000	N	0	110	Yes (019S0001, 019S0002)
	13-15'	4/4	93.5 - 172	122.83	265.12	0	NA		NA	NA		NA	110	Yes (019S0004,019S0005)
Beryllium	0-1'	2/2	0.44 - 0.53	0.485	1	0	160	C	0	4,100	C	0	58	No
	13-15'	4/4	0.37 - 0.5	0.5	1	0	NA		NA	NA		NA	58	No
Cadmium	0-1'	2/2	0.86 - 0.88	0.87	1.54	0	39	N	0	1000	N	0	NL	No
	13-15'	3/4	0.05 - 0.14	0.1	3.24	0	NA		NA	NA		NA	NL	No
Chromium	0-1'	2/2	9.2 - 12.6	10.9	23.89	0	230 [g]	N	0	6100 [g]	N	0	2.1 [g]	Yes (019S0001, 019S0002)
	13-15'	4/4	10.8 - 14.2	12.9	28.28	0	NA		NA	NA		NA	2.1 [g]	Yes (019S0003, 019S0004, 019S0005, 019S0006)
Cobalt	0-1'	2/2	8.0 - 8.6	8.3	15.98	0	4,700	N	0	120,000	N	0	NL	NA
	13-15'	4/4	5.9 - 10.5	7.5	14.36	0	NA		NA	NA		NA	NL	NA
Copper	0-1'	2/2	10.6 - 14.4	12.5	24.19	0	3,100	N	0	82,000	N	0	530	NA
	13-15'	4/4	14.9 - 18.3	16.48	32.52	0	NA		NA	NA		NA	530	NA
Lead	0-1'	2/2	75.3 - 96.6	85.95	26.03	0	400 [h]		0	1,000 [h]		0	400 [h]	NA
	13-15'	4/4	8.7 - 20.7	14.9	19.8	0	NA		NA	NA		NA	400 [h]	NA
Mercury	0-1'	0/2	ND	NA		0	NL		0	NA		0	NL	No
	13-15'	4/4	0.02 - 0.03	0.25	0.176	0	NA		NA	NA		NA	NL	No
Nickel	0-1'	2/2	15.6 - 19.9	17.75	20.62	0	1,600	N	0	41,000	N	0	NL	No
	13-15'	4/4	15.4 - 20.3	17.1	NA	0	NA		NA	NA		NA	NL	No
Selenium	0-1'	1/2	0.37	NA	BDL	1 (019S0001)	390	N	0	10,000	N	0	0.95	No
	13-15'	0/4	ND	NA		0	NA		NA	NA		NA	0.95	No
Silver	0-1'	2/2	ND	ND	2.05	0	390	N	0	10,000	N	0	1.6	No
	13-15'	1/4	0.21	NA	NA	0	NA		NA			NA	1.6	No
Tin	0-1'	2/2	21.3 - 37.6	29.45	33.56	1 (019S0002)	47,000	N	0	1,200,000	N	0	NL	No
	13-15'	0/4	ND	NA		0	NA		NA	NA		NA	NL	No
Vanadium	0-1'	2/2	17.0 - 20.8	18.9	45.11	0	550	N	0	14,000	N	0	260	No
	13-15'	4/4	19.8 - 26.4	23.3	43.68	0	NA		NA			NA	260	No
Zinc	0-1'	2/2	83.6 - 166	124.8	98	1 (019S0001)	23,000	N	0	610,000	N	0	680	No
	13-15'	4/4	48.5 - 59.9	54.3	109	0	NA		NA	NA		NA	680	No

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Notes:

a	—	Feet bls
b	—	Range lower limit is the lowest detected concentration.
c	—	Mean is based on detected parameter concentrations only.
d	—	Background reference concentration (2X mean background). Section 3 of this report discusses RCs.
e	—	Residential and industrial screening values (RBC-Res., BC-Ind.) are from the *Risk-Based Concentration Table* (October 27, 1999).
f	—	A "Yes" in this column indicates that at least one sample result exceeded the SSL for this analyte; a "No" indicates no sample results exceeding the SSL.
g	—	Risk-based data for hexavalent chromium (VI).
h	—	Value is soil cleanup level for total lead (USEPA OSWER Directive, 9355.4-12).
NA	—	Not applicable
"N"	—	noncarcinogen-based RBC
"C"	—	carcinogen-based RBC
ND	—	Not Detected

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5.3.6 SWMU 19 — VOCs Detected in Groundwater

4-Methyl-2-pentanone was detected in sample 019G000150 at a concentration of 1.1 μg/L, which does not exceed its tap water RBC (2,900 μg/L). No MCL listed for this compound.

5.4 SWMU 20 — Analytical Results

Six locations were sampled at SWMU 20. Subsurface soil samples were collected at two of the five locations (020S0010 and 020S0011) from depths of 5 to 7 feet and 11 to 13feet bls. Groundwater screening samples were collected from the fluvial deposits using DPT at three of the five locations (020G0007, 020G0008, and 020G0009) (Figure 4.4). The groundwater samples were collected from depths of 40, 50, and 60 feet bls from each of the three locations. A piezometer with a 5-foot screen was installed at each of the three groundwater sampling locations. Piezometer 020GPZ01 was installed at sample location 020G0007 and was completed at a depth of 50 feet, piezometer 020GPZ02 was installed at location 020G0008 at a depth of 49 feet, and piezometer 020GPZ03 was installed at location 020G0009 and completed at a depth of 47 feet. All soil and groundwater samples were analyzed for VOCs, which were selected as indicator parameters capable of detecting chlorinated solvents in addition to petroleum-related compounds.

5.4.1 SWMU 20 — VOCs Detected in Soil

The following VOCs were detected in SWMU 20 soil samples:

Acetone	1,2-Dichloropropane	Toluene
Benzene	Ethylbenzene	1,1,1-Trichloroethane
MEK	Methylene Chloride	1,1,2-Trichloroethane
1,1-Dichloroethane	4-Mehtyl-2-Pentanone	Trichloroethene
1,1-Dichloroethene	Tetrachloroethene	Xylene (total)
1,2-Dichloroethene (total)		

Of these compounds, 1,1-dichloroethane, 1,2-dichloroethene, ethylbenzene, 1,1,1-trichloroethane, toluene, and xylene were also detected in the sample collected of UWT-1594's contents prior to its removal.

Table 5.7 and Figure 5.10 summarize the organics detected in subsurface soil samples analyzed at the offsite laboratory. No surface samples were collected because the site is paved and there was no surface release. The only release was from the UWT, so the samples were collected from a depth close to the tank pit's bottom, and above the soil-water interface. Because no surface soil samples were collected, samples were not compared to RBCs. Eight compounds in subsurface soil exceeded SSLs.

Acetone was detected in the 5- to 7-foot interval samples 020S001007 and 020S001107 at 130 μg/kg and 69 μg/kg. It was also detected in the 11- to 12-foot interval samples 020S001013 and 020S001113 at 160 μg/kg and 59 μg/kg. Its SSL (120 μg/kg) was only exceeded at location 020S0010.

Benzene was detected in the 5- to 7-foot interval samples 020S001007 and 020S001107 at 2.5 μg/kg each. It was also detected in the 11- to 12-foot interval samples 020S001013 and 020S001113 at 3.5 μg/kg and 4.1 μg/kg. All four detections exceeded benzene's SSL of 0.1 μg/kg.

1,1-Dichloroethene was detected in samples 020S001007 and 020S001107 collected from the 5 to 7-foot interval at 7.6 μg/kg and 13 μg/kg. It was also detected in samples 020S001013 and 020S001113 collected from the 11- to 13-foot interval at 7 μg/kg and 12 μg/kg. All four detections exceeded 1,1-dichloroethene's SSL of 0.0018 μg/kg.

FORMER LOCATION
OF BUILDING 1594

FORMER
UWT 1594
LOCATION

	020S0010 ■	
Benzene	2.5	(5 to 7')
	4.1	(11 to 13')
1,1-Dichloroethene	7.6	(5 to 7')
	7	(11 to 13')
1,2-Dichloropropane	3.3	(5 to 7')
	11	(11 to 13')
Methylene Chloride	140	(5 to 7')
	170	(11 to 13')
Tetrachloroethene	80	(5 to 7')
	210	(11 to 13')
Trichloroethene	38	(5 to 7')
	79	(11 to 13')
Acetone	130	(5 to 7')
	160	(11 to 13')

	■ 020S0011	
Benzene	2.5	(5 to 7')
	3.5	(11 to 13')
1,1-Dichloroethene	13	(5 to 7')
	12	(11 to 13')
1,2-Dichloropropane	4.2	(11 to 13')
Methylene Chloride	140	(5 to 7')
	120	(11 to 13')
Tetrachloroethene	56	(5 to 7')
	69	(11 to 13')
Trichloroethene	39	(5 to 7')
	40	(11 to 13')
1,1,2-Trichloroethene	7	(11 to 13')

LEGEND

● – NO VOC EXCEEDS ITS SSL

■ – AT LEAST ONE COMPOUND EXCEEDS ITS SSL

(5 to 7') – INDICATES DEPTH OF SAMPLE COLLECTION

CONCENTRATIONS ARE REPORTED IN μg/Kg.

0 20 40

GRAPHIC SCALE IN FEET

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FIGURE 5.10
SWMU 20
SSL EXCEEDANCES FOR
ORGANICS IN SUBSURFACE SOIL

DWG DATE: 01/25/00 | DWG NAME: 0141R024

Table 5.7
SWMU 20 — Screening Results for Subsurface Soil (μg/kg)

Parameter	Sample Interval [a]	Frequency of Detection [b]	Range of Detection [c]	Mean [d]	SSL [e]	SSL Exceedance [d]
1,1,1-Trichloroethane	5 to 7	2/2	88 - 100	94	510	No
	11 to 13	2/2	95 - 140	117.5	510	No
1,1,2-Trichloroethane	5 to 7	0/2	NA	NA	0.039	No
	11 to 13	1/2	7	NA	0.039	Yes (020S0011)
1,1-Dichloroethane	5 to 7	1/2	5.1	NA	230	No
	11 to 13	1/2	45	NA	230	No
1,1-Dichloroethene	5 to 7	2/2	7.6 - 13	10.3	0.0018	Yes (020S0010, 020S0011)
	11 to 13	2/2	7 - 12	9.5	0.0018	Yes (020S0010, 020S0011)
1,2-Dichloroethene (total)	5 to 7	2/2	5.6 - 8.1	6.85	19	No
	11 to 13	2/2	4.7 - 6.6	5.65	19	No
1,2-Dichloropropane	5 to 7	1/2	3.3	NA	0.1	Yes (020S0010)
	11 to 13	2/2	4.2 - 11	7.6	0.1	Yes (020S0010, 020S0011)
MEK	5 to 7	2/2	22 - 27	24.5	400	No
	11 to 13	2/2	12 - 38	25	400	No
4-Methyl-2-Pentanone	5 to 7	1/2	52	NA	NL	No
	11 to 13	1/2	4.4	NA	NL	No
Acetone	5 to 7	2/2	69 - 130	99.5	120	Yes (020S0010)
	11 to 13	2/2	59 - 160	109.5	120	Yes (020S0010)
Benzene	5 to 7	2/2	2.5 - 2.5	2.5	0.1	Yes (020S0010, 020S0011)
	11 to 13	2/2	3.5 - 4.1	3.8	0.1	Yes (020S0010, 020S0011)
Ethylbenzene	5 to 7	2/2	12 - 15	13.5	750	No
	11 to 13	2/2	12 - 32	22	750	No
Methylene chloride	5 to 7	2/2	140 - 140	140	0.95	Yes (020S0010, 020S0011)
	11 to 13	2/2	120 - 170	145	0.95	Yes (020S0010, 020S0011)
Tetrachloroethene	5 to 7	2/2	56 - 80	68	2.4	Yes (020S0010, 020S0011)
	11 to 13	2/2	69 - 210	139.5	2.4	Yes (020S0010, 020S0011)
Toluene	5 to 7	2/2	11 - 12	11.5	440	No
	11 to 13	2/2	14 - 31	22.5	440	No
Trichloroethene	5 to 7	2/2	38 - 39	38.5	0.77	Yes (020S0010, 020S0011)
	11 to 13	2/2	40 - 79	59.5	0.77	Yes (020S0010, 020S0011)
Xylene (Total)	5 to 7	2/2	50 - 60	55	8,500	No
	11 to 13	2/2	46 - 140	93	8,500	No

Notes:

a — Feet bls
b — Range lower limit is the lowest detected concentration.
c — Mean is based on detected concentrations only.
d — Residential and industrial screening values (RBC-Res., RBC-Ind.) are from the October 1999 Risk-Based Concentration Table (October 27, 1999, USEPA Region III memo).
e — A "Yes" in this column indicates that at least one sample result exceeded the SSL for this analyte; a "No" indicates no sample results exceeded the SSL.
NA — Not applicable
ND — Not Detected
NL — Not listed
"N" — noncarcinogen-based RBC
"C" — carcinogen-based RBC

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1,2-Dichloropropane exceeded its SSL (0.1 μg/kg) with 3 μg/kg in sample 020S001007 (5 to 7-foot interval) and in samples 020S001013 and 020S001113 (11 to 13-foot interval) at 4.2 μg/kg and 11 μg/kg.

Tetrachloroethene was detected at 56 μg/kg and 80 μg/kg in samples 020S001007 and 020S001107 collected from the 5 to 7-foot interval. It was also detected at 69 μg/kg and 210 μg/kg in samples 020S001013 and 020S001113 collected from the 11 to 13-foot interval. All four detections exceed it's SSL of 2.4 μg/kg.

The contaminants listed above are indicative of petroleum products and solvents, which would be expected in waste oil and hydraulic fluid. Sample results from the CSI indicated that the horizontal extent of these compounds was less than 40 feet from UWT-1594. Although some of the compounds detected in RFI samples exceeded their SSLs, only two were detected in groundwater samples collected during the RFI's DPT phase, indicating that vertical migration of most compounds was limited to the vadose zone. Acetone is a common laboratory artifact and may have been introduced into the sample during its extraction or analysis.

5.4.2 SWMU 20 — VOCs Detected in Fluvial Depsoits Groundwater

Groundwater samples were collected at SWMU 20 using DPT, from temporary piezometers installed with DPT, and from one monitoring well. MEK was detected in sample 020G000760 at 14 μg/L , which does not exceed its tap water RBC (1,900 μg/L) and there is no MCL listed.

The following compounds were detected in the temporary piezometers:

Acetone MEK

These compounds were detected in piezometer 020GPZ01 and neither exceeded their screening criteria.

One fully penetrating monitoring well was installed adjacent to the downgradient piezometer (020GPZ03) to confirm the presence of the compounds detected in the DPT phase and to determine their extent. Sample results for each interval of this well were below the method detection limit, indicating that the release from UWT-1594 has had minimal impact on the fluvial deposits groundwater. Based on the RFI data, the compounds in groundwater have migrated less than 60 feet from the source and have not impacted the full thickness of the fluvial deposits.

5.5 SWMU 22 — TPH Detected in Soil

Subsurface soil samples were collected from seven SWMU 22 locations. The samples were collected from the tank fill and native soil beneath the tanks and analyzed for TPH-GRO and EPH. The results are presented in Table 5.8 and Figure 5.11. Because no permeability data are available for SWMU 22, the 500 ppm cleanup level was assigned to this site for more conservative comparison.

As seen in Table 5.8, results for samples 022SGB1408, 022SGB1420 and 022SGB1512 exceed the 500 ppm cleanup level. It has not been determined if the contamination exists in native soil outside tank pit. Exception for boring 022SGB14, it appears that the contamination is limited to the upper 12 feet of soil.

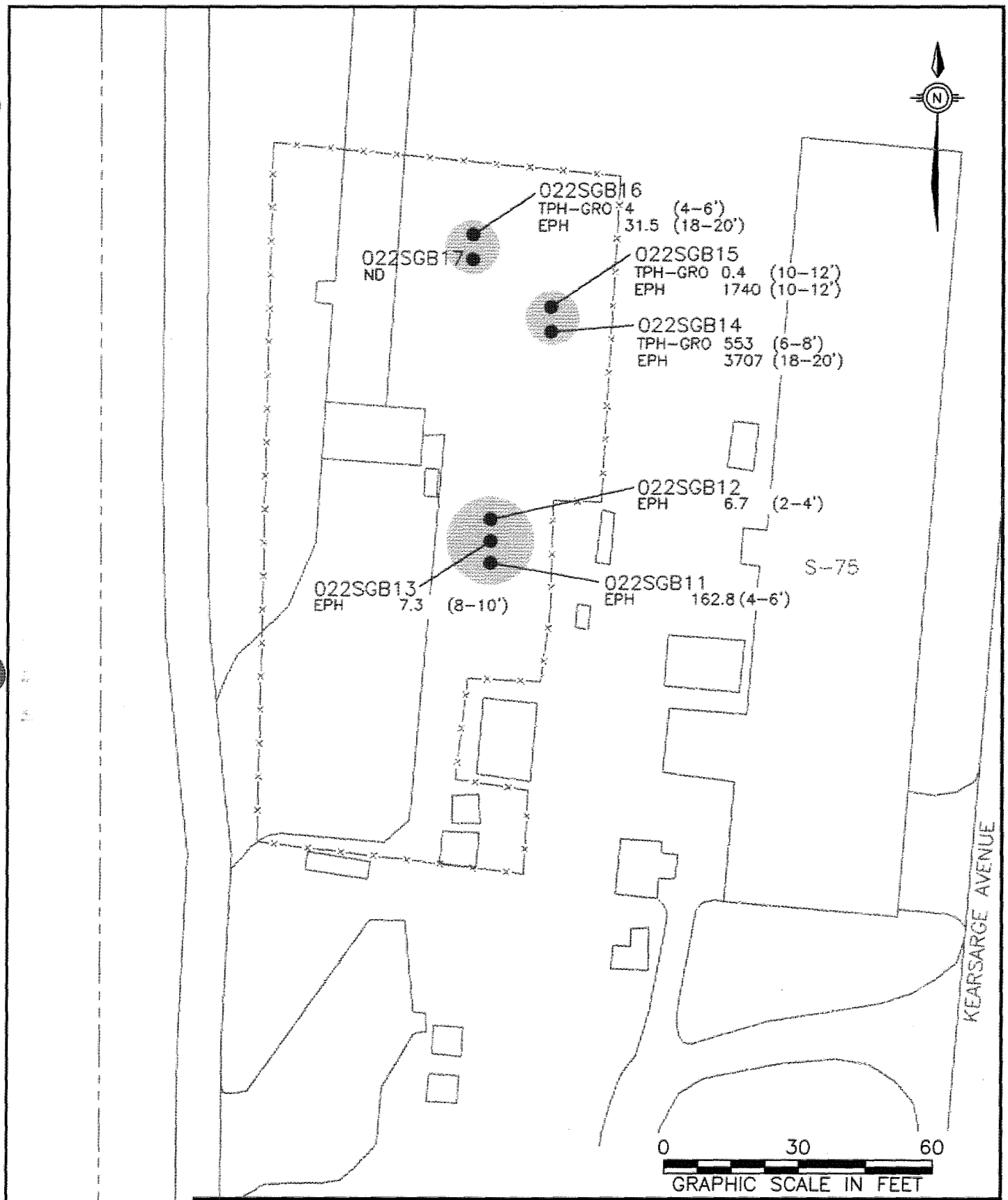

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FIGURE 5.11
SWMU 22
TPH-GRO AND EPH
RESULTS FOR SOIL

DWG DATE: 01/25/00 | DWG NAME: 0140R031

Table 5.8
Results for SWMU 22 Soil Samples (mg/kg)

Sample ID	Sample Interval (feet bls)	TPH-GRO Results	EPH Results
022SGB1104	2 to 4	BQL	BQL
022SGB1106	4 to 6	BQL	162.8
022SGB1204	2 to 4	BQL	6.7
022SGB1310	8 to 10	BQL	7.3
022SGB1320	18 to 20	BQL	BQL
022SGB1408	6 to 8	BQL	553
022SGB1420	18 to 20	NA	3707
022SGB1512	10 to 12	0.4	1,740
022SGB1520	18 to 20	BQL	BQL
022SGB1606	4 to 6	BQL	4
022SGB1620	18 to 20	BQL	31.5
022SGB1710	8 to 10	BQL	BQL
022SGB1720	18 to 20	NA	BQL
022SGB1720 (duplicate)	18 to 20	NA	BQL

Notes:
BQL — Below Quantitation Limit
NA — Not analyzed. Insufficient volume for both analyses.

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5.6 SWMU 39 — Analytical Results

Soil samples were collected from six locations at SWMU 39 (Figure 4.8). Surface soil (0 to 1-foot bls) samples were collected from five locations beneath the foundation of former Building S-74. Subsurface soil samples were collected at location 039S0023 from depths of 9- to 11-feet and 11- to 13-feet bls. All soil samples were analyzed for VOCs only.

Groundwater screening samples were collected from both the loess and the fluvial deposits. Groundwater screening samples from the loess were collected from 11 locations at depths ranging from 11 to 14 feet bls. Groundwater screening samples were collected from the fluvial deposits using DPT at 55 locations across the SWMU 22 and 39 area and at offsite locations as discussed in Section 4.2.5. Typically, samples from the fluvial deposits were collected from three depth intervals (40 feet, 50 feet and 60 feet bls). A few locations were limited to two depth intervals due to poor recharge or refusal.

Wells were installed at nine locations at SWMU 39. Groundwater samples were collected from each of these wells at various depths. For the data summary table, the samples were grouped into intervals of 40 to 69 feet, 70 to 89 feet, and 90 to 109 feet to represent the upper, middle, and lower portions of the fluvial deposits.

5.6.1 SWMU 39 — VOCs Detected in Soil

The following VOCs were detected in SWMU 39 soil samples:

Acetone	Tetrachloroethene
MEK	Toluene
cis-1,2-Dichloroethene	Trichloroethene (TCE)
Ethylbenzene	Xylene (total)

Table 5.9 and Figure 5.12 summarize the organics detected in SWMU 39 soil samples. cis-1,2-Dichloroethene, tetrachloroethene and TCE were detected in surface soil samples collected beneath the building foundation at concentrations that exceed SSLs. Acetone exceeded its SSL in one subsurface soil sample. No other detected compound exceeded either its residential or industrial RBC or its SSL.

Tetrachloroethene was detected in sample 039SF00301 at 100 μg/kg, which exceeds its SSL of 2.4 μg/kg.

TCE was detected in sample 039SF00301 at 23 μg/kg, which exceeds its SSL of 0.77 μg/kg.

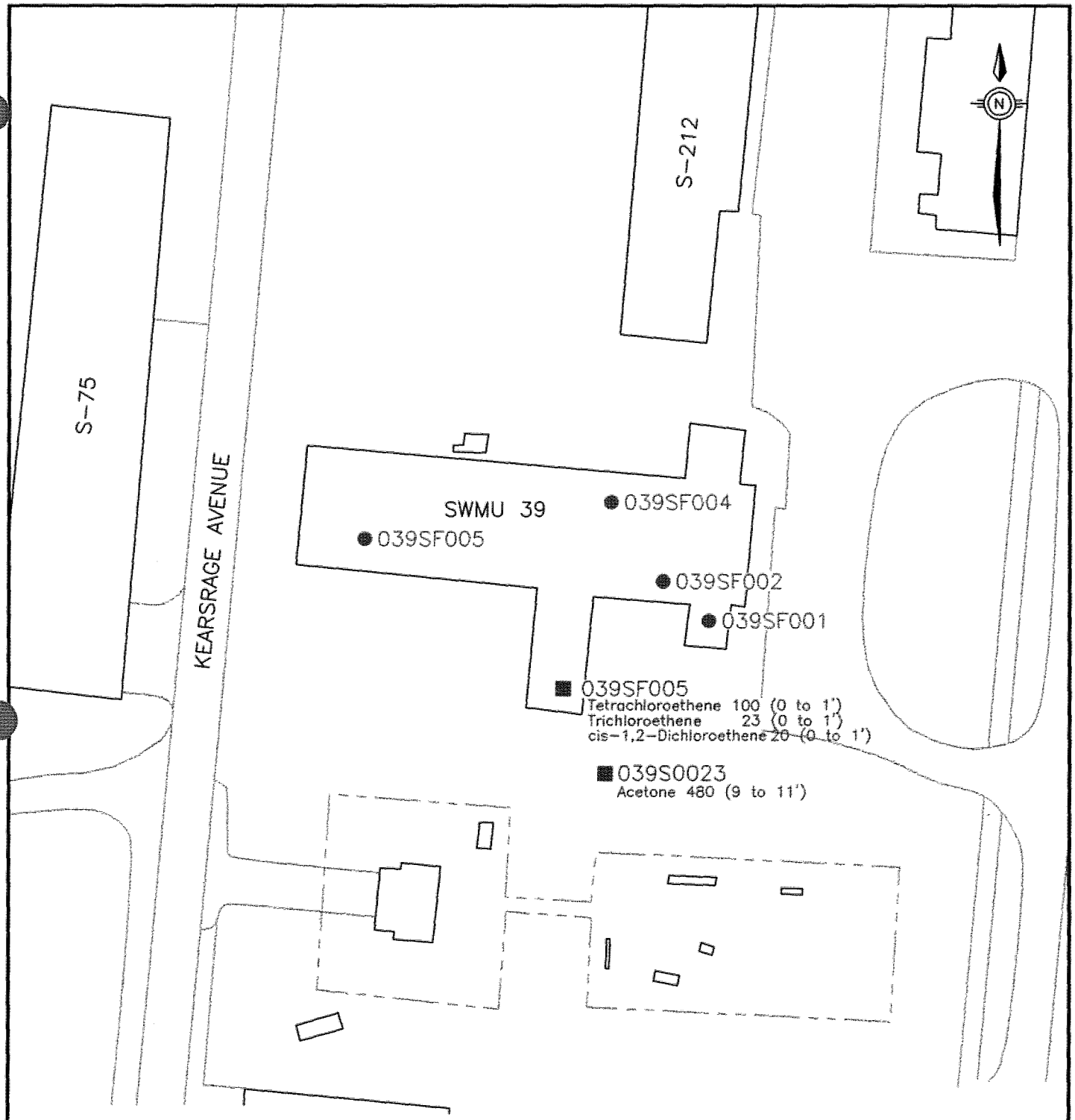
Acetone was detected in subsurface soil sample 039S002311 at 480 μg/kg, exceeding its SSL of 120 μg/kg.

MEK was detected in surface soil sample 039SF00301 at 27 μg/kg, which does not exceed it RBCs or SSL.

cis-1,2-Dichloroethene was detected in surface soil sample 039SF00301 at 27 μg/kg. This detection does not exceed its RBCs but does exceed its SSL.

Ethylbenzene was detected in surface soil sample 039SF00301 at 560 μg/kg and in subsurface soil sample 039S002311 at 390 μg/kg. Neither detection exceeds its RBCs or SSL.

Toluene was detected in surface soil sample 039SF00301 at 20 μg/kg, which does not exceed its RBCs or SSL.



LEGEND

● – NO COMPOUND EXCEEDED ITS RBC OR SSL

■ – AT LEAST ONE COMPOUND EXCEEDS ITS RBC OR SSL

(0 to 1') – INDICATES DEPTH OF SAMPLE COLLECTION

CONCENTRATIONS ARE REPORTED IN $\mu g/Kg$.

0 100 200

GRAPHIC SCALE IN FEET

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FIGURE 5.12
SWMU 39
RBC AND SSL EXCEEDANCES
FOR ORGANICS IN SOIL

DWG DATE: 02/04/00 | DWG NAME: 0141R025

Table 5.9
SWMU 39 — Organics in Soil Samples (μg/kg)

Parameter	Sample Interval [a]	Frequency of Detection	Range of Detection [b]	Mean [c]	Residential Soil RBC [d]		RBC - Res. Exceedances	Industrial Soil RBC		RBC-Ind. Exceedances	SSL [d]	SSL Exceedance [e]
MEK	0 to 1	1/5	27	NA	4.7E+07	N	0	1.2E+09	N	0	400	No
	9 to 11	0/1	ND	NA	NA		NA	NA		NA	400	No
	11 to 13	0/1	ND	NA	NA		NA	NA		NA	400	No
Acetone	0 to 1	0/5	ND	NA	7.8E+06	N	NA	2.0E+08	N	NA	120	No
	9 to 11	1/1	480	NA	NA		NA	NA		NA	120	Yes (039S0023)
	11 to 13	0/1	ND	NA	NA		NA	NA		NA	120	No
cis-1,2-Dichloroethene	0 to 1	1/5	20	NA	7.8E+05	N	0	2.0E+07	N	0	17	Yes (039SF003)
	9 to 11	0/1	ND	NA	NA		NA	NA		NA	17	No
	11 to 13	0/1	ND	NA	NA		NA	NA		NA	17	No
Ethylbenzene	0 to 1	1/5	560	NA	7.8E+06	N	0	2.0E+08	N	0	750	No
	9 to 11	1/1	390	NA	NA		NA	NA		NA	750	No
	11 to 13	0/1	ND	NA	NA		NA	NA		NA	750	No
Tetrachloroethene	0 to 1	1/5	100	NA	1.2E+04	C	0	1.1E+05	C	0	2.4	Yes (039SF003)
	9 to 11	0/1	ND	NA	NA		NA	NA		NA	2.4	No
	11 to 13	0/1	ND	NA	NA		NA	NA		NA	2.4	No
Toluene	0 to 1	1/5	20	NA	1.6E+07	N	0	4.1E+08	N	0	440	No
	9 to 11	0/1	ND	NA	NA		NA	NA		NA	440	No
	11 to 13	0/1	ND	NA	NA		NA	NA		NA	440	No
Trichloroethene	0 to 1	1/5	23	NA	5.8E+04	C	0	5.2E+05	C	0	0.77	Yes (039SF003)
	9 to 11	0/1	ND	NA	NA		NA	NA		NA	0.77	No
	11 to 13	0/1	ND	NA	NA		NA	NA		NA	0.77	No
Xylene (Total)	0 to 1	1/5	6,600	NA	1.6E+08	N	0	4.1E+09	N	0	8,500	No
	9 to 11	1/1	2,800	NA	NA		NA	NA		NA	8,500	No
	11 to 13	1/1	330	NA	NA		NA	NA		NA	8,500	No

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Notes:

a	—	Feet bls
b	—	Range lower limit is the lowest detected concentration.
c	—	Mean is based on detected concentrations only.
d	—	Residential and industrial screening values (RBC-Res., RBC-Ind.) are from the October 1999 Risk-Based Concentration Table (October 27, 1999, USEPA Region III memo).
e	—	A "Yes" in this column indicates that at least one sample result exceeded the SSL for this analyte; a "No" indicates no sample results exceeded the SSL.
NA	—	Not applicable
ND	—	Not Detected
NL	—	Not listed
"N"	—	noncarcinogen-based RBC
"C"	—	carcinogen-based RBC

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Xylene was detected in surface soil sample 039SF00301 at6,600 μg/kg, and in subsurface soil samples 039S002311 and 039S002313 at 2,800 μg/kg and 330 μg/kg respectively. None of these detections exceed xylene's RBCs or SSL.

Except for acetone and MEK, the compounds detected in soil are indicative of dry-cleaning solvent (petroleum-based and tetrachloroethene). Surface soil sampling location 039SF0003 was collected near a floor drain in Building S-74, which once housed the base laundry. It is likely that dry-cleaning solvent was either disposed of down the drain, or spilled solvent was washed into the drain where it leaked into the soil from cracks in the pipes or separations in the pipe joints. Although cis-1,2-dichloroethene, tetrachloroethene and TCE exceed their SSLs, only acetone, ethylbenzene, and xylene have migrated into subsurface soil sampling intervals and loess groundwater. Lateral extent in surface soil appears limited to the 039SF0003 sampling location.

5.6.2 SWMU 39 — VOCs in Loess Groundwater

The following VOCs were detected in the loess deposits groundwater samples at SWMU 39:

Benzene	Ethylbenzene
1,2-Dichloroethene (total)	Toluene
4-Methyl-2-pentanone	Xylene (total)

Of these compounds, ethylbenzene, and xylene were also detected in the liquid and sludge samples collected from UST S-212 at the time of its removal.

As seen in Table 5.10 and Figure 5.13, VOCs were only detected at sample location 039G0014. Results for all other loess groundwater screening locations were nondetect. Of the compounds detected, only 1,2-dichloroethene (total) and benzene exceeded any regulatory limits.

Benzene exceeded its tap water RBC (0.36 μg/L) at a concentration of 2 μg/L.

1,2-Dichloroethene (total) exceeded its tap water RBC (0.12 μg/L) at a concentration of 26 μg/L.

4-Methyl-2-pentanone was detected in loess groundwater sample 039G001411 at 4.3 μg/L. This detection does not exceed the compounds' residential or industrial RBC or SSL.

Ethylbenzene was detected in loess groundwater sample 039G001411 at 120 μg/L, which does not exceed its RBCs or SSL.

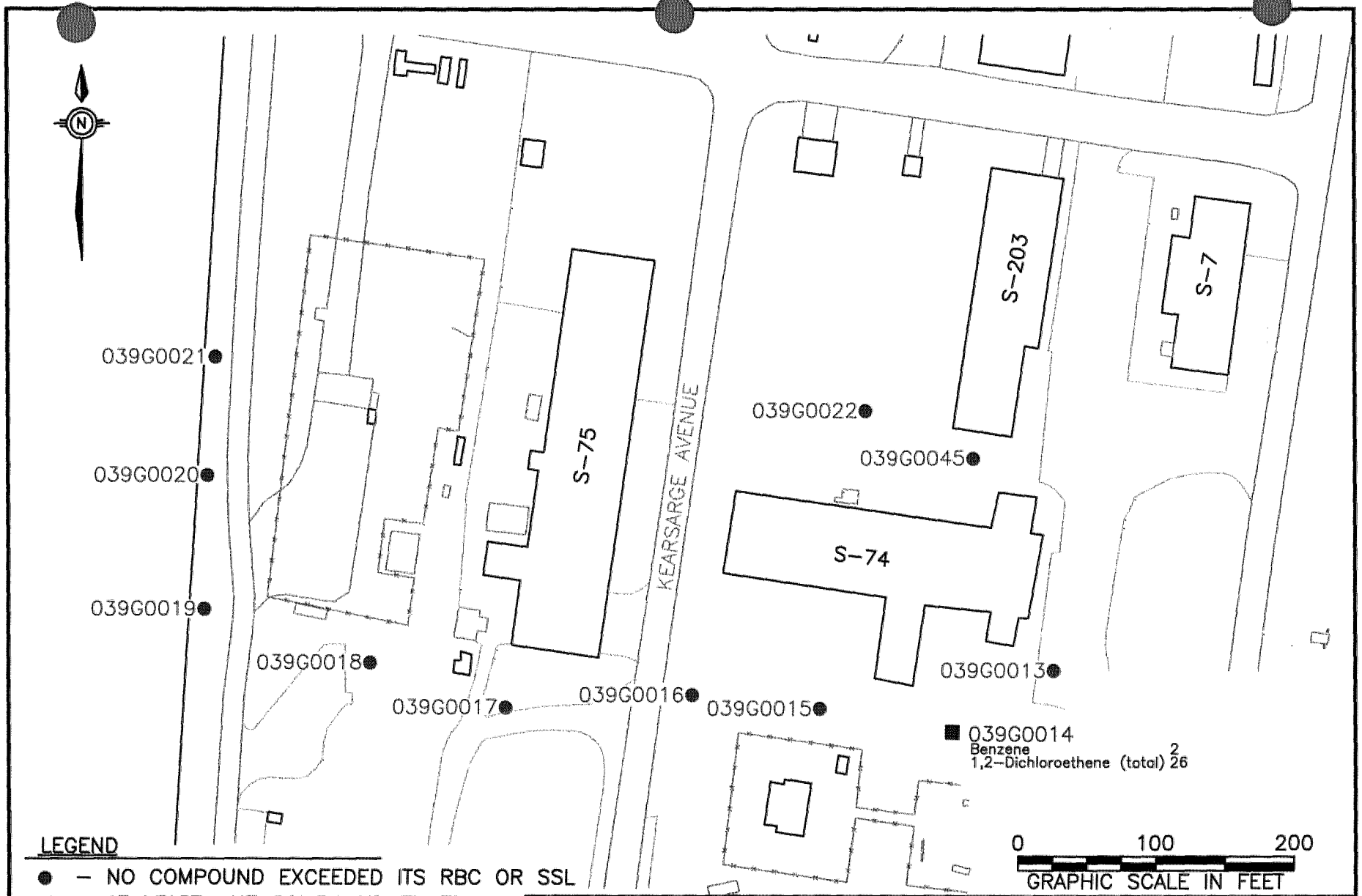
5.6.3 SWMU 39 — VOCs in Fluvial Deposits Groundwater Screening Samples

The following VOCs were detected in fluvial deposits groundwater screening samples:

Acetone	MEK
Chloromethane	Naphthalene
1,2-Dichloroethane	Toluene
cis-1,2-Dichloroethene	TCE
Ethylbenzene	Xylene (total)

Of these compounds, acetone, ethylbenzene, TCE, and xylene were also detected in the liquid and sludge samples collected from UST S-212 prior to its removal.

As seen in Table 5.11 and Figure 5.14, TCE was the only VOC to exceed both its tap water RBC (1.6 μg/L) and MCL (5 μg/L).



LEGEND

● – NO COMPOUND EXCEEDED ITS RBC OR SSL

■ – AT LEAST ONE COMPOUND EXCEEDS ITS RBC OR SSL

LOESS GROUNDWATER SAMPLES WERE COLLECTED FROM 14 FEET BGS

CONCENTRATIONS ARE REPORTED IN $\mu g/L$

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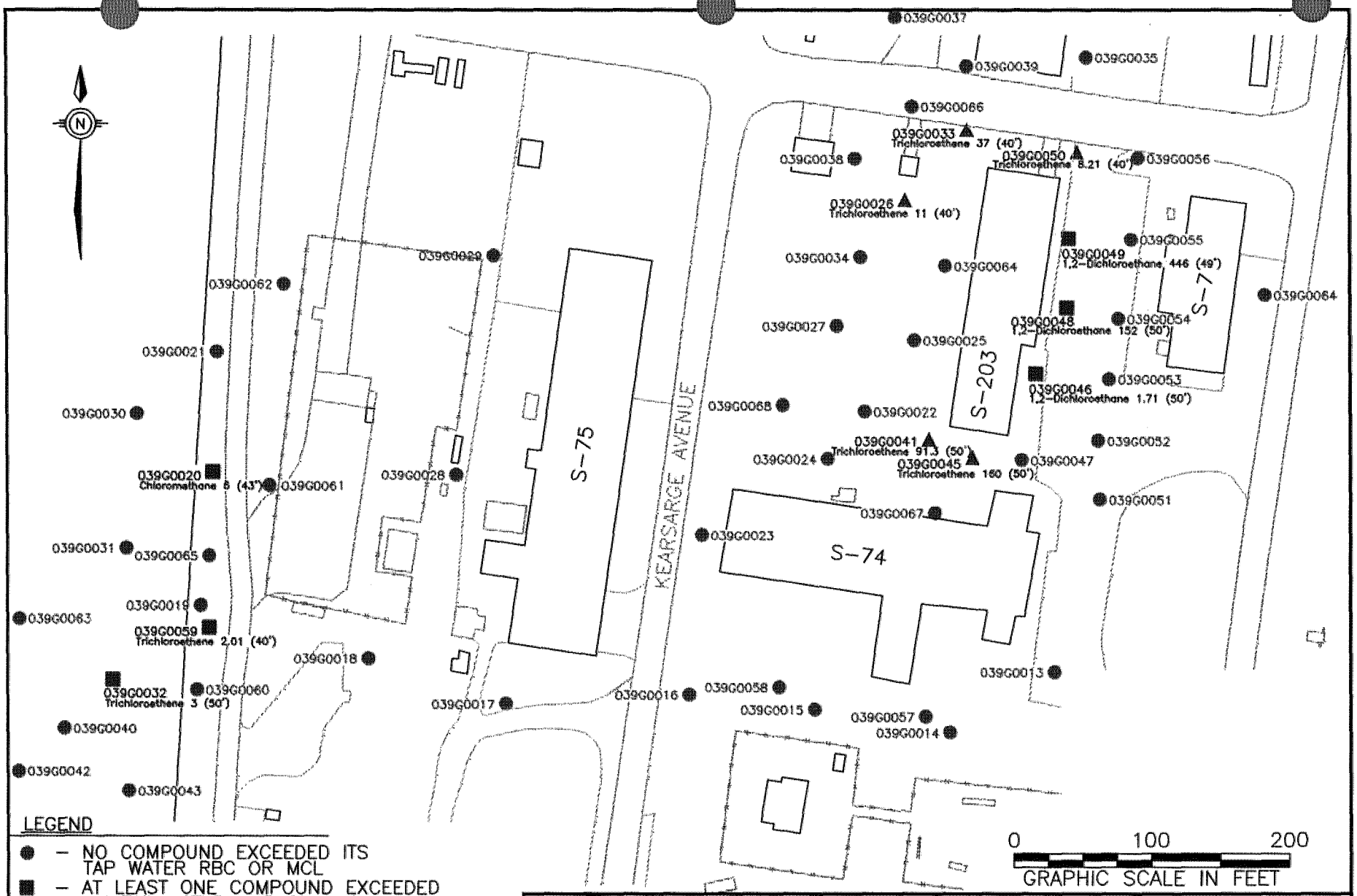
FIGURE 5.13
SWMU 39
VOC EXCEEDANCES
IN LOESS GROUNDWATER

DWG DATE: 01/25/00 | DWG NAME: 0141R026



LEGEND

- ● – NO COMPOUND EXCEEDED ITS TAP WATER RBC OR MCL
- ■ – AT LEAST ONE COMPOUND EXCEEDED ITS TAP WATER RBC OR MCL
- ▲ – AT LEAST ONE COMPOUND EXCEEDED ITS TAP WATER RBC AND MCL
- (49') – INDICATES DEPTH OF SAMPLE COLLECTION

CONCENTRATIONS ARE REPORTED IN $\mu g/L$

DUE TO A LABELLING ERROR IN THE FIELD, THERE IS NO LOCATION 039G0044.

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MILLINGTON, TENNESSEE

FIGURE 5.14
SWMU 39
TAP WATER RBC AND MCL EXCEEDANCES FOR VOCs IN GROUNDWATER SCREENING SAMPLES COLLECTED USING DPT

DWG DATE: 01/25/00 | DWG NAME: 0141R028

Table 5.10
SWMU 39 — VOCs Detected in
Loess Deposits Groundwater (μg/kg)

Parameter	Sample Interval [a]	Frequency of Detection	Range of Detection [b]	Mean [c]	Tap Water RBC [d]		Tap Water RBC Exceedances	MCL [e]	MCL Exceedances
Benzene	12 to 14	1/11	2	NA	3.60E-01	N	1	5	0
1,2-Dichloroethene (total)	12 to 14	1/11	26	NA	5.48E+00	N	1	5	1
Ethylbenzene	12 to 14	1/11	120	NA	1.30E+03	N	0	700	0
4-Methyl-2-Pentanone	12 to 14	1/11	4.3	NA	1.39E+01	N	0	NL	0
Toluene	12 to 14	1/11	11	NA	7.50E+02	N	0	1,000	0
Xylene (Total)	12 to 14	1/11	830	NA	1.20E+04	N	0	10,000	0

Notes:
Toluene was detected in loess groundwater sample 039G001411 at 11 μg/L. This detection does not exceed toluene's residential or industrial RBC or SSL.

Xylene was detected in loess groundwater sample 039G001411 at830 μg/L, which does not exceed its RBCs or SSL.

The compounds detected in loess groundwater are all indicative of dry-cleaning solvent (petroleum-based and tetrachloroethene) and most likely originated from the same source as the surface soil contamination identified beneath the slab of former Building S-74 and/or UST S-212. Based on the nondetects observed in surrounding loess groundwater sample locations, it appears that lateral extent in the loess is limited to the immediate area of location 039G0014.

a — Feet bls
b — Range lower limit is the lowest detected concentration.
c — Mean is based on detected concentrations only.
d — Residential and industrial screening values (RBC-Res. and RBC-Ind.) are from the October 1999 Risk-Based Concentration Tables, (October 27, 1999 USEPA Region III RBC memorandum).
e — MCL values are from the October 1996 Drinking Water Regulations and Health Advisories Table (October 1999, USEPA).
C — Carcinogen
N — Noncarcinogen
NL — Not Listed
ND — Not Detected
NA — Not Applicable

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Table 5.11
SWMU 39 — VOCs Detected in Fluvial Deposits
Groundwater Screening Samples (μg/kg)

Parameter	Sample Interval [a]	Frequency of Detection	Range of Detection [b]	Mean [c]	Tap Water RBC [d]		Tap Water RBC Exceedances	MCL [e]	MCL Exceedances
1,2-Dichloroethane	40	1/53	4.46	NA	1.20E-01	C	1 (039G0049)	5	No
	50	2/52	1.52 - 1.71	1.62	1.20E-01	C	2 (039G0046, 039G0048)	5	No
	60	0/47	ND	NA	1.20E-01	C	0	5	No
MEK	40	1/53	26		1.90E+03	N	0	NL	No
	50	1/52	30	NA	1.90E+03	N	0	NL	No
	60	0/47	ND	NA	1.90E+03	N	0	NL	No
Acetone	40	6/53	10 - 460	108	3.70E+03	N	0	NL	No
	50	5/53	24.4 - 260	100	3.70E+03	N	0	NL	No
	60	0/47	ND	NA	3.70E+03	N	0	NL	No
Chloromethane	40	1/53	6		1.50E+00	C	1 (039G0020)	NL	No
	50	0/52	ND	NA	1.50E+00	C	0	NL	No
	60	0/47	ND	NA	1.50E+00	C	0	NL	No
cis-1,2-Dichloroethene	40	1/53	6		6.10E+01	N	0	70	No
	50	1/52	1.12	NA	6.10E+01	N	0	70	No
	60	0/47	ND	NA	6.10E+01	N	0	70	No
Ethylbenzene	40	1/53	3.1	NA	1.30E+03	N	0	700	No
	50	1/52	3	NA	1.30E+03	N	0	700	No
	60	0/47	ND	NA	1.30E+03	N	0	700	No
Naphthalene	40	0/53	ND	NA	6.5E+00	N	0	NL	No
	50	1/52	3	NA	6.5E+00	N	0	NL	No
	60	0/47	ND	NA	6.5E+00	N	0	NL	No
Toluene	40	4/53	2.6 - 5.44	3.7	7.50E+02	N	0	1,000	No
	50	0/52	ND	NA	7.50E+02	N	0	1,000	No
	60	0/47	ND	NA	7.50E+02	N	0	1,000	No
Trichloroethene	40	4/53	2.01 - 37	15	1.60E+00	C	4 (039G0026, 039G0033 039G0050, 039G0059)	5	Yes (039G0026, 039G0033 039G0050)
	50	5/52	1.2 - 160	55	1.60E+00	C	4 (039G0032, 039G0041, 039G0045)	5	Yes (039G0041, 039G0045)
	60	1/47	1.35		1.60E+00	C	0	5	No
Xylene (Total)	40	2/53	2.5 - 32	17	1.20E+04	N	0	10,000	No
	50	3/52	5.9 - 24	14	1.20E+04	N	0	10,000	No
	60	0/47	ND	NA	1.20E+04	N	0	10,000	No

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Notes:

a — Feet bls
b — Range lower limit is the lowest detected concentration.
c — Mean is based on detected concentrations only.
d — Residential and industrial screening values (RBC-Res. and RBC-Ind.) are from the October 1999 Risk-Based Concentration Tables, (October 27, 1999 USEPA Region III RBC memorandum).
e — MCL values are from the October 1996 Drinking Water Regulations and Health Advisories Table (October 1999, USEPA).
C — Carcinogen
N — Noncarcinogen
NL — Not Listed
ND — Not Detected
NA — Not Applicable

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Acetone concentrations ranged from 10 μg/L to 460 μg/L in six fluvial deposits groundwater screening samples collected from the 40-foot interval and in five samples collected from 24.4 μg/L to 260 μg/L in the 50-foot interval. It was not detected in the 60-foot interval. No acetone detection exceeded its RBC or MCL.

Chloromethane was detected in one sample collected from the 40-foot interval (039G002043) at a 6 μg/L, which exceeds its tap water RBC (1 μg/L). It was not detected in any 50-foot or 60-foot sample. No MCL listed for chloromethane.

1,2-Dichloroethane was detected at 4.46 μg/L in one sample collected from the 40-foot interval (039G004940) and at 1.71 μg/L and 1.52 μg/L in two samples collected from the 50-foot interval (039G004650 and 039G004850). It was not detected in the 60-foot interval. All of the detections exceed the tap water RBC for 1,2-dichloroethane (1 μg/L), but not the MCL (5 μg/L).

cis-1,2-Dichloroethene was detected at 6 μg/L in one sample from the 40-foot interval (039G003340), which exceeded its tap water RBC (5.48 μg/L), and at 1.12 μg/L in one sample from the 50-foot interval (039G004550). It was not detected in the 60-foot sample interval. Neither detection exceeds the tap water RBC or MCL.

Ethylebenzene was detected at 3.1 μg/L in one sample from the 40-foot interval (039G001440), and at 3 μg/L in one sample from the 50-foot interval (039G001450). It was not detected in the 60-foot interval. Neither detection exceeds the tap water RBC or MCL for ethylbenzene.

MEK was detected at 26 μg/L in one sample from the 40-foot interval (039G002243), and at 30 μg/L one sample collected from the 50-foot interval (039G002150). It was not detected in the 60-foot interval. MEK did not exceed its RBC or MCL in either sample.

Naphthalene was detected at 3 μg/L in one sample from the 50-foot interval (039G003650). It was not detected in either the 40-foot or 60-foot sample interval. There is no tap water RBC or MCL for naphthalene.

TCE was detected in samples 039G002640 (11 μg/L), 039G003340 (37 μg/L), 039G005040 (8.21 μg/L), 039G004150 (91.30 μg/L), and 039G004550 (160 μg/L), at concentrations exceeding its RBC and MCL and in samples 039G005940 (2.01 μg/L) and 039G003250 (3 μg/L), at concentrations exceeding only the tap water RBC. TCE was also detected in samples 039G004050 (1.2 μg/L) and 039G004160 (1.35 μg/L), but these do not exceed either the tap water RBC or MCL.

Toluene was detected at concentrations ranging from 2.6 μg/L to 5.44 μg/L in four samples from the 40-foot sample interval: 039G001640, 039G0840, 039G001943 and 039G005540. None of these detections exceed the tap water RBC or MCL for toluene. Toluene was not detected in either the 50- or 60-foot sample interval.

Xylene was detected at 2.5 μg/L and 32 μg/L in two samples collected from the 40-foot sample interval: 039G001440 and 039G001640. It was detected in three samples collected from the 50-foot interval (039G001450, 039G001455 and 039G002150) at concentrations ranging from 5.9 μg/L to 24 μg/L. Xylene was not detected in any sample collected from the 60-foot interval.

The compounds detected in the fluvial deposits consist primarily of petroleum-based compounds and chlorinated solvents. Detections of the petroleum constituents (ethylbenzene and xylene) and acetone were concentrated in the sample locations south of the former Building S-74 slab. Toleuene was also detected in one location south of the slab. Based on the results of surface and subsurface soil and loess groundwater samples, these detections are most likely associated with the former dry-cleaing facility formerly located in Building S-74 and/or UST S-212. While none

of these compounds exceed their risk-based screening criteria, they have impacted the fluvial deposits groundwater. Sporatic toluene detections were observed southwest and west of Building S-75 and west of Building S-7, but these detections are probably unrelated to Building S-74 activities.

Isolated detections of 1,2-dichloroethene, MEK, and naphthalene were observed across the investigation area, but only 1,2-dichloroethane exceeded its tapwater RBC. Because these isolated detections were scattered and at locations hydraulically upgradient of the former Building S-74 slab, it is unlikely that they result from activities conducted at that building.

Chloromethane, 1,2-dichloroethane, and TCE all exceeded at least one screening criteria. Chloromethane was detected in one sample interval at one location. Deeper sampling intervals, and locations surrounding the detection, were all nondetect for chloromethane, suggested limited extent of this compound.

TCE is a degredation product of tetrachloroethene and would be an expected constituent from a site contaminated by dry-cleaning solvent. However, all TCE detections were from locations hydraulically upgradient of the former Building S-74 slab and the former location of UST S-212. As shown on Figure 5.15, three areas are contaminated with TCE; one is between the Building S-74 slab and Building S-203, another is northwest of Building S-203, and a third is west of Building S-75. The third area includes an offsite detection. Each area is surrounded by sample locations with no TCE detections, suggesting that these areas may be from unrelated sources; none appears to be S-74.

1,2-dichloroethene exceeded its tap water RBC in three locations along the east side of Building S-203; a hazardous materials storage area, hydraulically upgradient of the Building S-74 slab, and the former location of UST S-212. 1,2-dichloroethane is not a degradation product of

tetrachloroethene and is probably unrelated the the dry-cleaning activities once conducted at Building S-74. These 1,2-dichloroethane detections parallel an abandoned rail spur and may result from isolated spills while offloading solvent containers from railcars. Surrounding locations that were nondetect for 1,2-dichloroethane suggest that groundwater contamination is limited to the immediate area of the railspur. Nondetects in deeper intervals of the railspur sampling locations suggest 1,2-dichloroethane has not migrated through the full thickness of the fluvial deposits.

5.6.4 VOCs Detected in Fluvial Desposits Groundwater Samples

The following compounds were detected in the fluvial deposits groundwater samples collected from the SWMU 39 monitoring wells:

Acetone	1,2-Dichloroethene (total)	TCE
Carbon disulfide	cis-1,2-Dichloroethene	Xylene (total)
Chloromethane	Toluene	

Of these compounds, acetone, TCE, and xylene were detected in the liquid and sludge samples collected from UST S-212 prior to its removal.

As seen in Table 5.13 and Figure 5.15, chloromethane, 1,2-dichloroethane, and TCE exceeded at least one screening criteria.

Acetone was detected in eight samples from the 40- to 69-foot sample interval at concentrations ranging from 1 μg/L to 6 μg/L. It was detected in four samples from the 70- to 90-foot interval at concentrations ranging from 2 μg/L to 6 μg/L and in three samples from the 90- to 109-foot interval at concentrations ranging from 2 μg/L to 7 μg/L. None of these detections exceeded acetone's tap water RBC. There is no MCL listed for acetone.

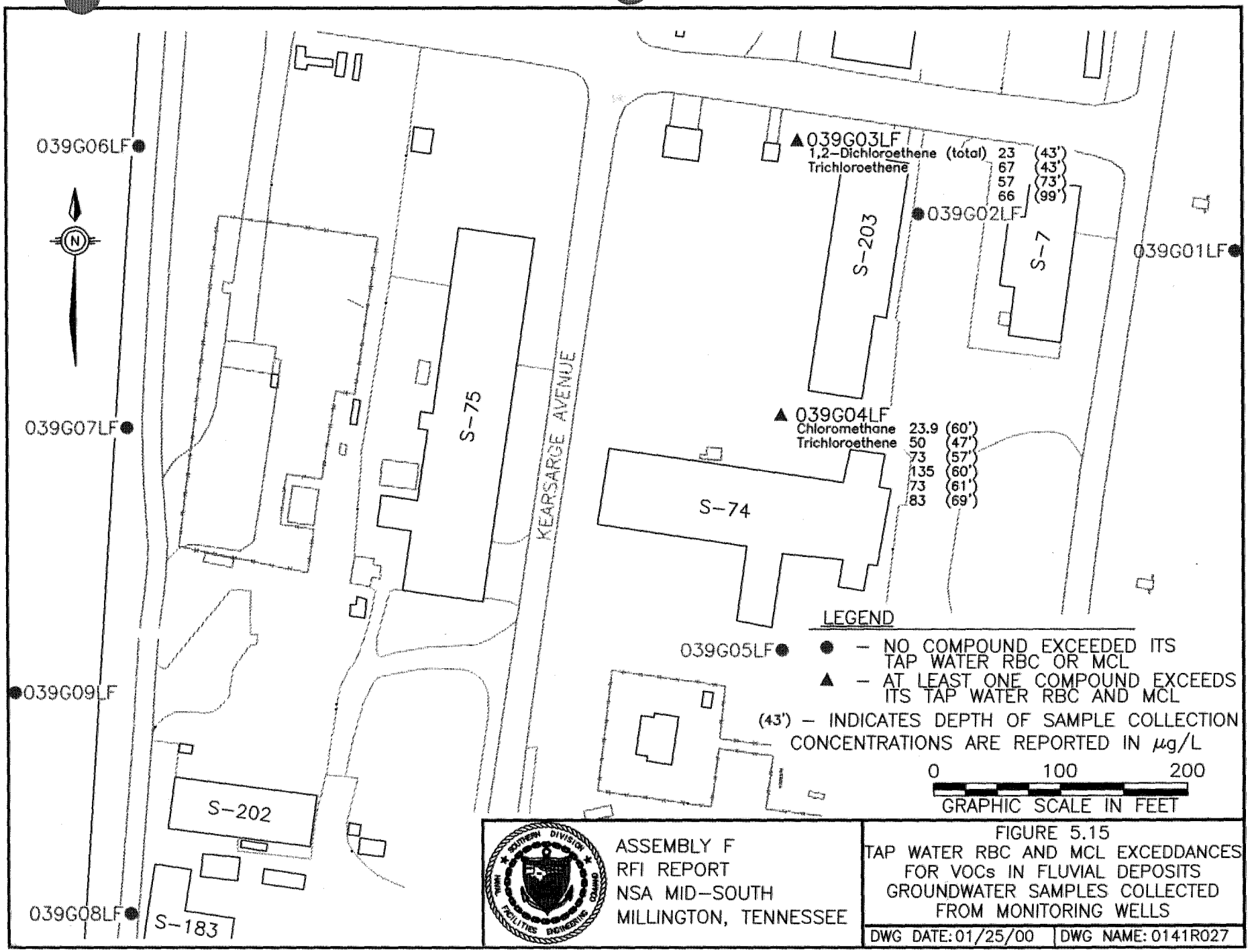
039G06LF
039G07LF
039G09LF
039G08LF
S-183
S-202
S-75
KEARSARGE AVENUE
039G05LF
S-74
039G03LF
1,2-Dichloroethene (total) 23 (43')
Trichloroethene 67 (43')
57 (73')
66 (99')
039G02LF
S-203
S-7
039G01LF
039G04LF
Chloromethane 23.9 (60')
Trichloroethene 50 (47')
73 (57')
135 (60')
73 (61')
83 (69')
LEGEND
● – NO COMPOUND EXCEEDED ITS TAP WATER RBC OR MCL
▲ – AT LEAST ONE COMPOUND EXCEEDS ITS TAP WATER RBC AND MCL
(43') – INDICATES DEPTH OF SAMPLE COLLECTION
CONCENTRATIONS ARE REPORTED IN μg/L
0 100 200
GRAPHIC SCALE IN FEET
ASSEMBLY F
RFI REPORT
NSA MID-SOUTH
MILLINGTON, TENNESSEE
FIGURE 5.15
TAP WATER RBC AND MCL EXCEDDANCES
FOR VOCs IN FLUVIAL DEPOSITS
GROUNDWATER SAMPLES COLLECTED
FROM MONITORING WELLS
DWG DATE: 01/25/00
DWG NAME: 0141R027

Table 5.12
SWMU 39 — VOCs Detected in
Fluvial Deposits Groundwater (μg/kg)

Parameter	Sample Interval [a]	Frequency of Detection	Range of Detection [b]	Mean [c]	Tap Water RBC [d]		Tap Water RBC Exceedances	MCL [e]	MCL Exceedances
1,2-Dichloroethene (total)	40 to 69	2/25	10 - 23	17	5.48E+00	N	0	5	2 (039G03LF43, 039G04LF57)
	70 to 89	1/8	2	NA	5.48E+00	N	0	5	0
	90 to 109	1/5	2	NA	5.48E+00	N	0	5	0
Acetone	40 to 69	8/25	1 - 6	3	3.70E+03	N	0	NL	NA
	70 to 89	4/8	2 - 6	4	3.70E+03	N	0	NL	NA
	90 to 109	3/5	2 - 7	4	3.70E+03	N	0	NL	NA
Carbon disulfide	40 to 69	2/25	1 - 1.3	1	1.00E+03	N	0	NL	NA
	70 to 89	0/8	ND	NA	1.00E+03	N	0	NL	NA
	90 to 109	0/5	ND	NA	1.00E+03	N	0	NL	NA
Chloromethane	40 to 69	1/25	23.9	NA	1.50E+00	C	1 (039GA4LF60)	NL	NA
	70 to 89	0/8	ND	NA	1.50E+00	C	0	NL	NA
	90 to 109	0/5	ND	NA	1.50E+00	C	0	NL	NA
cis-1,2-Dichloroethene	40 to 69	1/4	1.1	NA	6.10E+01	N	0	70	0
	70 to 89	0/8	ND	NA	6.10E+01	N	0	70	0
	90 to 109	0/0	ND	NA	6.10E+01	N	0	70	0
Toluene	40 to 69	2/25	0.3 - 0.65	0.5	7.50E+02	N	0	1,000	0
	70 to 89	0/8	ND	NA	7.50E+02	N	0	1,000	0
	90 to 109	0/5	ND	NA	7.50E+02	N	0	1,000	0
Trichloroethene	40 to 69	6/25	50 - 135	80	1.60E+00	C	6 (039G03LF43, 039G04LF47 039G04LF57, 039G04LF61, 039G04LF69, 039GA4LF60)	5	6 (039G03LF43, 039G04LF47 039G04LF57, 039G04LF61, 039G04LF69, 039GA4LF60)
	70 to 89	1/8	57	NA	1.60E+00	C	1 (039G03LF73)	5	1 (039G03LF73)
	90 to 109	1/5	66	NA	1.60E+00	C	1 (039G03LF99)	5	1 (039G03LF99)
Xylene (Total)	40 to 69	2/25	0.37 - 0.66	0.52	1.20E+04	N	0	10,000	0
	70 to 89	0/8	ND	NA	1.20E+04	N	0	10,000	0
	90 to 109	0/5	ND	NA	1.20E+04	N	0	10,000	0

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Notes:

a — Feet bls
b — Range lower limit is the lowest detected concentration.
c — Mean is based on detected concentrations only.
d — Residential and industrial screening values (RBC-Res. and RBC-Ind.) are from the October 1999 Risk-Based Concentration Tables, (October 27, 1999 USEPA Region III RBC memorandum).
e — MCL values are from the October 1996 Drinking Water Regulations and Health Advisories Table (October 1999, USEPA).
C — Carcinogen
N — Noncarcinogen
NL — Not Listed
ND — Not Detected
NA — Not Applicable

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Carbon disulfide was detected at 1 μg/L and 1.3 μg/L in two samples collected from the 40- to 69-foot interval: 039G03LF43 and 039GA4LF60. Neither exceeded the tap water RBC and no MCL is listed for carbon disulfide. There were no detections in samples from the 70- to 89-foot or 90- to 109-foot interval.

Chloromethane was detected at 23.9 μg/L in one sample collected from the 40- to 69-foot sampling interval (039GA4LF60). This detection exceeded its tap water RBC of 1.5 μg/L. Chloromethane was not detected in either the 70- to 89-foot or 90- to 100-foot sample intervals.

cis-1,2-Dichloroethene was detected at 1.1 μg/L in one sample from the 40- to 69-foot interval (039GA4LF60). This detection does not exceed the tap water RBC or MCL. There were no detections in the samples from the 70- to 89-foot or 90- to 109-foot interval.

1, 2-Dichloroethene (total) was detected at 10 μg/L and 23 μg/L in two samples collected from the 40- to 69-foot interval (039G03LF43 and 039G04LF57). Both exceed the MCL (5 μg/L), and tap water RBC (5.48 μg/L). It was detected in one sample each from the 70- to 89-foot interval and 90- to 109-foot interval. Neither exceeded the tap water RBC or MCL.

TCE was detected at concentrations ranging from 50 μg/L to 135 μg/L in six samples from the 40- to 69-foot interval: 039G003LF43, 039G04LF47, 039G04LF57, 039G04LF61, 039G04LF69 and 039GA4LF60. All exceeded the tap water RBC (1.6 μg/L) and MCL (5 μg/L). TCE was also detected at 57 μg/L in one sample collected from the 70- to 89-foot sample interval (039G03LF73) and at 66 μg/L one from the 90- to 109-foot interval (039G03LF99). Both exceeded the tapwater RBC and MCL.

Toluene was detected at 0.65 μg/L and 0.3 μg/L in two samples collected from the 40- to 69-foot interval (039GA4LF60 and 039GA9LF50). Neither one exceeded the tap water RBC and there

is no MCL listed for toluene. There were no detections in the samples from the 70- to 89-foot or 90- to 109-foot interval.

Xylene was detected at 0.66 μg/L and 0.37 μg/L in two samples from the 40- to 69-foot interval (039GA4LF60 and 039GA9LF50). Neither one exceeded the tap water RBC and there is no MCL listed for xylene. There were no detections in the samples from the 70- to 89-foot or 90- to 109- foot interval.

Of the compounds detected in the monitoring wells, only chloromethane, 1,2-dichloroethene, and TCE exceeded their screening levels. As previously discussed, 1,2-dichloroethene and TCE are degradation products of tetrachloroethene, which was detected in the surface soil samples along with TCE. However, their detections were at locations hydraulically upgradient of the Building S-74 slab and the former location of UST S-212, so they appear to come from a source other than the base's former laundry or the UST. It is possible that containers were spilled while being offloaded from rail cars on the east side of Building S-203 as 1,2-dichloroethane was.

Chloromethane was detected in monitoring well 039G04LF, but not in the DPT samples collected from that same area. It was detected in a DPT phase sample at a location approximately 350 feet to the east, but was not in monitoring well 039G07LF, which was in the same general area. Based on these results, chloromethane appears to be isolated within these two areas.

Acetone was detected in six of nine wells and carbon disulfide was detected in two of nine wells. Both compounds are common laboratory artifacts and could have been introduced to the sample during extraction or analysis.

Toluene and xylene were both detected in onsite well 039G04LF and offsite well 039G09LF. While these compounds are both indicative of petroleum-based dry-cleaning solvent, the locations of these detections suggest they probably are not related to the Building S-74 activities.

5.7 Summary of Nature and Extent

Data from both the DPT screening investigation and RFI are included in this nature and extent summary.

5.7.1 SWMU 17

Benzene, tetrachloroethene, and naphthalene in SWMU 17 soil exceed their SSLs. Antimony exceeded its background RC and SSL.

Benzene, which was detected in three subsurface soil samples from around the tank pit, appear to be limited to this area. Tetrachloroethene was detected in both surface and subsurface samples, but only exceeded its SSL in surface soil. These compounds are both possible constituents of waste oil. The depth and locations of their detections suggests that UWT S-9 is the likely source.

The naphthalene and tetrachloroethene detected in surface soil are probably not related to a release from the underground tank because their collection depth is shallower than the top of the tank. The naphthalene could be from the asphalt paving and tetrachloroethene could be from a small, isolated surface spill. A large tetrachloroethene spill or multiple spills would probably have been detected in subsurface soil or groundwater.

Benzene, 1,2-dichloropropane, and 1,1,1-trichloroethane were detected in fluvial deposits groundwater samples. While 1,2-dichloropropane, and 1,1,1-trichloroethane are possible waste oil constituents, they were not detected in soil and have possibly migrated from an offsite source.

The underground tank is the most likely benzene source because it exceeded its SSL in soil and in a sample from UWT S-9 prior to its removal.

TPH was detected in six of nine subsurface samples from around the underground tank, and in 35 of 39 samples collected along the pipe trench. However, only four of these detections exceed the activity's 100 ppm cleanup level for TPH-contaminated soil less than 5 feet bls. None exceeded TDEC's 1,000 ppm cleanup level.

The inorganic concentrations observed at the site are most likely naturally occuring and represent ambient soil conditions.

5.7.2 SWMU 19

Acetone, benzene, ethylbenzene, toluene, xylene, and naphthalene exceeded their SSLs in soil. No inorganic exceeded its RC and RBC or SSL. There were no tap water RBC or MCL groundwater exceedences.

The depth and locations of the organics detected in surface soil suggest that UWT N-757 is not their source. While they are likely constituents of waste oil, all but acetone are also found in the asphalt that covers the site. Acetone is a common laboratory artifact and may have been introduced intothe sample during extraction or analysis.

The TPH detections were limited to three subsurface soil sample locations around the underground tank. Their locations suggest that UWT N-757 as the most likely source. Only one location exceeds TDECs 1,000 ppm TPH soil cleanup level.

Although RCs were exceeded for selenium, tin, and zink, these are most likely naturally occurring.

5.7.3 SWMU 20

Acetone, benzene, 1,2-dichloropropane, 1,1-dichloroethane, 1,1-dichloroethene, methylene chloride, tetrachloroethene, and TCE all exceeded their SSLs in subsurface soil in the the 5- to 7-foot and 11- to 13-foot sampling intervals. 1,1,2-Trichloroethane exceed is SSLs in the 11- to 13-foot interval only. Although these compounds exceeded their SSLs, the fact that none except acetone was detected in groundwater suggested limited vertical migration. CSI samples that were nondetect for these compounds indicate limited lateral extent as well.

1,1-Dichloroethane and 1,1,1-trichloroethene were the only compounds also detected in the sample from UWT S-1594, but all are likely components of waste oil and most likely came from a release from the tank. Also, methylene chloride may have been introduced to the sample from an exogenous source.

Acetone and MEK were detected in groundwater sampled during the DPT phase. Neither exceeded its tap water RBCs or MCLs nor were they detected in the fully penetrating monitoring well hydraulically downgradient from the UWT. Additionally, the acetone detected during the DPT phase may have been introduced from an exogenous source. Based on these results, it appears that this SWMU's impact to groundwater was minimal.

5.7.4 SWMU 22

EPH was detected in at least one sample interval in all but one of the seven locations sampled. Only two detections exceeded SWMU 22's 500 ppm cleanup level. Both were from within the backfilled tank pit of former UST S-1245. The highest concentration was in the 18- to 20-foot sampling interval.

5.7.5 SWMU 39

cis-1,2-Dichloroethene, tetrachloroethene and trichloroethene exceeded their SSLs in surface soil. Acetone, a common laboratory artifact, exceeded its SSL in one subsurface sample, but probably was introduced into the sample during extraction or analysis. Benzene and 1,2-dichloroethene both exceeded their tap water RBCs in loess groundwater. Chloromethane, 1,2-dichloroethane, 1,2-dichloroethene and TCE exceeded their tap water RBC, MCL, or both in fluvial deposits groundwater. TCE and 1,2-dichloroethene are tetrachloroethene degredation products.

cis-1,2-Dichloroethene, tetrachloroethene and TCE were detected in surface soil sample 039SF003 from beneath Building S-74 which once housed the base laundry. Their most likely source was a dry-cleaning fluid release from the laundry. 1,2-Dichloroethene was detected in a loess groundwater sample within 50 feet of sample location 039SF003 and it probably resulted from a similar release. UST S-212 is a possible source of the benzene detected in loess groundwater.

It is unlikely that the TCE and 1,2-dichloroethene detected in fluvial deposits groundwater originated from the same sources. Most of these detections were in sampling locations surrounding Building S-203, which is hydraulically upgradient from Building S-74 and UST S-212 (Figures 5.14 and 5.15) . TCE exceeded its tap water RBC in two DPT locations, one onsite (039G0059) and one offsite (039G0032) approximately 350 feet west of Building S-74 (Figure 5.14). Other offsite DPT locations sampled downgradient of 039G0032 were nondetect for TCE. Monitoring well 039G09LF, installed offsite and downgradent of the offsite TCE detection, was also nondetect for TCE. Sample locations between the offsite detections and Building S-74 were nondetect for TCE, suggesting that its detection at these locations is unrelated to the base laundry.

Chloromethane and 1,2-dichloroethane were also detected in fluvial deposits groundwater. Neither is a degradation product of tetrachloroethene. Chloromethane exceeded its tap water

RBC at two locations spaced approximately 350 feet apart. It was detected in one DPT location (039G0020) sampled along the activity property boundary and in monitoring well 039G04LF. DPT locations surrounding these detections were all nondetect for chloromethane.

1,2-Dichloroethane was detected in samples collected through the abandoned rail spur that parallels the east side of Building S-203. These detections may have resulted from small containers that spilled while being unloaded from rail cars. Downgradient DPT locations paralleling the west side of Building S-203 were all nondetect for 1,2-dichloroethane, suggesting very limited migration of this compound.

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6.0 FATE AND TRANSPORT

This section provides guidance for evaluating the transport, transformation, and fate of contaminants in the environment. Specifically, fate and transport assessment seeks to evaluate a constituent's ability to become mobile or change in the environment. To accomplish this goal, the chemical and physical properties that govern the constituent's interaction within environmental media must be understood. Site characteristics, e.g., topography, geology, and hydrogeology, and characteristics of site soil, sediment, and water, as well as the contaminant's chemical and physical properties, play roles in evaluating the processes of fate and transport. To streamline the fate and transport discussion, this section focuses on understanding the properties which affect fate and transport. Each SWMU is discussed individually.

Evaluation of Assembly F SWMUs with regard to the above characteristics identified three potential routes of constituent migration:

- Air emissions resulting from VOCs released from surface soil.
- The leaching of constituents from soil to groundwater.
- Surface soil erosion and contaminant runoff.

6.1 Properties Which Affect Fate and Transport

The persistence, transport, and fate of chemicals in the environment depend on individual chemical and physical properties, as well as properties of the media in which the chemicals reside. These properties are briefly discussed in the following paragraphs, which also describe the significance of each property to volatilization, sorption, diffusion, dispersion, biodegradation, and other attenuation processes.

6.1.1 Chemical and Physical Properties

Chemical and physical properties relevant to evaluation of transport and fate of organic contaminants include water solubility, vapor pressure, Henry's law constant, specific gravity, organic carbon partition coefficient, distribution coefficient, and half life. Water solubility and adsorption coefficients are properties of interest for inorganic contaminants. After the properties are introduced, impact on each of the relevant classes of compounds is discussed. Table 6-1 provides an overview of chemical property behavior based on these properties. Table 6-2 describes the chemicals detected at each site and their properties. Table 6-3 summarizes the fate and transport assessment of each site.

Water Solubility

The solubility of a chemical in water is the maximum amount of the chemical that will dissolve in pure water at a specified temperature. Chemicals with high solubility are relatively mobile in water and are likely to leach from wastes and soils. These chemicals tend to have low volatilization potential, but do tend to be biodegradable. Conversely, chemicals with low solubility tend to adsorb on soils and sediments and are not readily biodegraded. They also have a greater tendency to volatilize.

Vapor Pressure

Vapor pressure is a measure of the tendency of a substance to pass from a solid or a liquid to a vapor state. It is measured as the pressure of the gas in equilibrium with the liquid or solid at a given temperature. From dry soils, the vapor pressure determines the volatilization of a given chemical to the atmosphere. From surface waters and moist soils, volatilization is dependent on vapor pressure and the Henry's law constant (discussed below). A chemical with a vapor pressure less than 10^{-6} millimeters of mercury (mm Hg) tends to associate with particulate matter; a chemical with a higher vapor pressure tends to associate with the vapor phase. Highly

water-soluble compounds generally show little volatilization from water or moist soils unless they also have a high vapor pressure.

Henry's Law Constant

The Henry's law constant describes a linear relation between vapor pressure and water solubility, providing a measure of a chemical's ability to move from water or moist soils to air. Compounds with Henry's law constants greater than 10^{-3} atmospheres-cubic meter per mole (atm-m^3/mole) can be expected to readily volatilize from water. Compounds with values ranging from 10^{-3} to 10^{-5} atm-m^3/mole exhibit moderate volatilization. Compounds with values less than 10^{-5} atm-m^3/mole show limited ability to volatilize from water or moist soils.

Specific Gravity

A substance's specific gravity (SG) of a substance is the ratio of the weight of a given volume of that substance to the weight of the same volume of water. The water weight is usually measured at 4°C; the other substance is often measured at some other temperature, typically 20°C. If the SG of a substance is less than 1.0, that substance will float on water; if the SG is greater than 1.0, the substance will sink in water. The SG can sometimes be used to predict the vertical distribution of the immiscible or insoluble portion of a chemical within an aquifer or other body of water.

Organic Carbon Partition Coefficient

The organic carbon partition coefficient (K_{oc}) is a measure of the degree to which an organic substance will preferentially dissolve in water or in an organic solvent. The typical range of K_{oc} values is from 1 to 10^7 milliliters per gram (mL/g), with higher values indicating a greater tendency to remain sorbed. Chemicals moving through the subsurface will alternately adsorb or desorb from available organic matter in the soil matrix. The higher the K_{oc} values, the greater the tendency of a chemical to be attracted to the organic fraction of the soil and lower its mobility in the subsurface environment.

Half-Life

A half life is the time required for the concentration of a substance to decrease from its initial level to one-half its initial level. The apparent decrease may be caused by various processes including biodegradation, reactions with other substances, or mass removal from the media in question.

VOCs can be expected to be mobile in the environment based on their physical and chemical properties. They have the potential to volatilize to the atmosphere, leach to groundwater or erode to surface water, and to move with groundwater flow. Relative to other categories of compounds, VOCs have low molecular weight and high water solubility, vapor pressure, and Henry's law constant, along with a corresponding low K_{oc}. These properties all enhance the potential for degradability of VOCs. Relative to chemicals in other categories, many VOCs tend to have relatively short half-lives in groundwater and surface water. VOCs have a limited tendency to adsorb to solids and can be expected to be moderately to highly mobile in the environment. Especially in near-surface soils, VOCs can migrate via diffusion through soil-air pore spaces to the ground surface, where they can be transported by wind.

SVOCs generally have higher molecular weights, but lower solubilities, vapor pressures, and Henry's law constants than VOCs. Because of higher K_{oc}, SVOCs tend to sorb to solids and are relatively immobile in the environment. Transport is more likely to occur in the solid phase than in the dissolved phase. For these reasons, SVOCs are likely to persist longer in the environment than VOCs and to be less mobile.

Pesticides/PCBs have moderate molecular weights; generally high densities; high K_{oc} values; and generally low solubilities, vapor pressures, and Henry's law constants. Typical fate and transport characteristics include a tendency to sorb to soil particles. They are hydrophobic (avoid water), immobile in the environment, and tend to degrade relatively slowly. Overall, pesticides/PCBs are

anticipated to be immobile and persistent in the environment, not readily diffusing into groundwater.

Herbicides can leach from soil particles to groundwater and tend to be mobile in both soil and groundwater. They tend to degrade relatively slowly. The chemical property with the greatest influence on the fate and transport of herbicides is solubility. Herbicides have low Henry's law constants and vapor pressures, and moderate molecular weights, organic carbon/water partitioning coefficients, and solubilities. Overall, herbicides are expected to be moderately mobile in groundwater with some retention in soil.

Inorganics chemicals do not degrade in the environment, but they may change chemical form or speciation. They are generally considered to be indefinitely persistent. Inorganic metals may interact with soil or other solids by ion exchange, adsorption, precipitation, or complexation and can act as catalysts in biodegradation processes. These processes are affected by pH, composition of leachate or groundwater oxidation-reduction condition, and the type and amount of organic matter, minerals, clay, and hydrous oxides present. In general, the solubility of metal compounds in potable groundwater is low, resulting in limited mobility in the environment. However, groundwater containing elevated concentrations of chloride, bicarbonate, sulfate, or phosphate can enhance the solubility and mobility of metal compounds by the formation of aqueous complexes.

Table 6-1
Chemical and Physical Properties

Chemical Property	Critical Value[a]	A chemical with a higher value may....	A chemical with a lower value may....
Vapor Pressure	10^{-3} mm Hg	be more volatile.	be less volatile.
Density[b]	water: 1.0 g/cm^3 air: 1.20 kg/m^3	sink in water or fall in the atmosphere.	float on water or rise in the atmosphere
Solubility	0 to 100 mg/L	leach from soil, is more mobile in water; and does not readily volatilize from water.	adsorb to soil, be immobile in water; and volatilizes from water.
Henry's Law Constant	10^{-3} to 10^{-5} atm-m^3/mole	volatilize easily from water.	not volatilize easily from water.
Half-Life	biologically dependent	not degrade readily.	degrade readily.
Organic Carbon Partition Coefficient	10 to 10,000 kg_{oc}/L_{water}	be more apt to remain in soil.	be more mobile and diffuse easily in water.

Notes:
a — Critical values are based on literature review and professional judgment.
b — Approximate density of air at standard temperature and pressure (STP).

6.1.2 Media Properties

The properties of environmental media used to evaluate fate and transport are total organic carbon, soil sorptive capacity, cation exchange capacity, redox conditions, pH, and hydrogeology. The following briefly discusses these properties.

Total Organic Carbon

The abiotic process of sorption (accumulation of the contaminant at the surface of a solid) will slow down the movement of the contaminant as it accumulates on the subsurface medium. For organic contaminants and subsurface materials with organic carbon present, sorption is common of hydrophobic chemicals into the soil organic carbon content. As the organic carbon content of the subsurface material increases, the total capacity of the soil to sorb the contaminant increases.

In fate and transport calculations, organic carbon is typically expressed as a percent of organic carbon (f_{oc}).

Distribution Coefficient

The distribution coefficient (K_d) is a valid representation of the partitioning between liquid and solids, or the ratio of the mass of contaminant in soil to the mass of contaminant dissolved in the groundwater and is used in modeling contaminant movement through the subsurface. The larger the K_d value, the greater the sorption to the solid phase. The simplest method for acquiring a K_d value for a specific contaminant is to obtain it from a K_{oc} value listed in literature sources. K_{oc} is analogous to K_d, except that the adsorbing material is considered to be the organic carbon (oc) in the soil as opposed to the entire soil matrix. By normalizing K_d on the basis of the soil's organic carbon content, a great deal of the variation observed among K_d values over different soils can be eliminated, thus, K_d can be estimated from the K_{oc} of the chemical and the f_{oc} in the soil, e.g., $K_d = K_{oc} x f_{oc}$.

Cation Exchange Capacity

Cation exchange capacity (CEC) reflects the soil's capacity to adsorb ions by neutralizing an ionic deficiency on its surface. Certain compounds can either gain or lose a proton as a function of pH and thus go from a neutral form to an ionic form. For organic compounds, this ionization will serve to greatly increase the solubility of the chemical in the groundwater. The gain of a proton will result in the formation of a positive ion. In this case, the ionic compound may associate to a greater degree with the CEC of the clay minerals. The overall impact on sorption (mobility) will depend on the relative sorption of the neutral and ionic forms of the compound.

Redox Conditions

Oxidation and reduction (redox) refer to the transfer of electrons and species change of ions or compounds. Redox involves oxidation (the loss of electrons), and reduction (the gain of

electrons). As an example, consider iron in groundwater. Groundwater, which reaches the surface in a highly reduced state, is exposed to the atmosphere (oxygen), resulting in oxidation of the iron. The oxidation of the iron is a reverse process and causes the iron to go from its soluble form to its insoluble complex.

pH

pH is a logarithmic measure of hydrogen ions in the soil and groundwater, indicating the medium's acidity or basicity. Chemicals react significantly differently under changing pHs. Low pH conditions tend to mobilize chemicals, especially inorganics, while high pH conditions may lead to the formation of immobile metal hydroxides.

Hydrogeology

The physical properties of soil (mineralogical composition, particle size distribution, etc.) dictate how a contaminant is transported in the subsurface. Some of the properties are porosity, hydraulic gradient, hydraulic conductivity, unsaturated flow, and saturated flow.

Porosity is defined as the ratio of openings (voids) to the total volume of a soil or rock. Typically, fine-grained materials tend to be better sorted and, thus, tend to have the largest porosities. Porosity indicates the maximum amount of water that a rock or soil can contain when it is saturated.

The groundwater table's direction of slope indicates the direction of groundwater movement. All other factors being constant, the rate of groundwater movement depends on the hydraulic gradient, which is the change in head per unit distance in a given direction. This property is important in contaminant transport because it may indicate the velocity and direction at which a contaminant may migrate in groundwater.

The factors controlling groundwater movement are largely dictated by hydraulic conductivity, which depends on the size and arrangement of pores and on the dynamic characteristics of groundwater such as viscosity and density. Hydraulic conductivity, which refers to soil's water transmitting characteristics, varies in different types of soil. If the hydraulic conductivity is essentially the same in any area of soil, it is said to be *homogeneous*; otherwise it is heterogeneous. Hydraulic conductivity tends to be greater in sand and less in material containing clay.

Most aquifer recharge occurs when water percolates across the unsaturated zone. Water movement in the unsaturated zone is controlled by both gravitational and capillary forces. Capillarity results from two forces: the mutual attraction (cohesion) between water molecules and the molecular attraction (adhesion) between water and different solid materials. As a consequence of these two forces, water is pulled upward into a capillary fringe above the water table. Flow in the unsaturated zone is important because contaminants released at the surface which percolate through the unsaturated zone may remain in the unsaturated zone due to capillarity, or they may arrive in the unsaturated zone due to a fluctuating water table.

In the saturated zone, all interconnected openings are full of water, and the groundwater moves through these openings in the direction controlled by the hydraulic gradient. Movement in this zone may be either laminar or turbulent. In laminar flow, water particles move in an orderly manner along streamlines. In turbulent flow, water particles move in a disordered, highly irregular manner, which results in a complex mixing of the particles. Dispersion is an important transport process of contaminants in the saturated zone. Dispersion is the process by which solutes are mixed with uncontaminated water, diluted, and transported due to the aquifer's heterogeneity. Also, diffusion is the process by which solutes are transported from a region of high concentration to a region of low concentration. In very fine sediments, diffusive transport may be the dominant process, although flow is typically advective, which is the process by which

dissolved substances migrate with flowing groundwater. This is the dominant transport process for contaminant movement in groundwater.

6.2 Fate and Transport Approach for Assembly F

Fate and transport discussions for each SWMU begin by describing site characteristics that have the potential to promote or inhibit contaminant migration. As presented in Section 6, three potential migration routes may exist. Each SWMU was evaluated as to site conditions that affect these migration pathways.

An individual contaminant's ability to migrate is evaluated based on three cross-media transfer mechanisms: soil to groundwater, surface soil to sediment (erosion of sorbed contaminants), and surface soil to air. The chemical and physical properties of the contaminant will be evaluated, where necessary, in support of each transfer mechanism. Table 6-2 presents the chemical and physical properties used to evaluate fate and transport for Assembly F contaminants.

The following sections describe the methods used to evaluate the potential migration of contaminants identified at each SWMU. When specific migration pathways do not exist for a SWMU, it is not discussed.

6.2.1 Soil-to-Groundwater Cross-Media Transport

To evaluate the potential for soil-to-groundwater migration of constituents, a phased screening approach was used to focus on chemicals with the greatest potential to impact the water-bearing zones. The screening process may be summarized as follows:

- Qualitative — Analytical data for soil and groundwater were compared to determine which chemicals were present in both media.

Due to the nature and age of most SWMU operations, it was assumed that any impacts associated with compounds with the potential to migrate from soil would be currently manifested in the shallow aquifer. The number and placement of monitoring wells or DPT groundwater samples was considered adequate to detect the presence of groundwater contamination. As a result, the qualitative comparison was used to identify those chemicals with reported concentrations in both media.

- Quantitative — Soil results were compared to the leachability-based soil-to-groundwater screening levels presented in Appendix A of the Soil Screening Guidance, Technical Background Document, (1996), Publication 9355.4-17A (OSWER USEPA, Washington DC). For organic contaminants, if the maximum detected concentration exceeds its SSL, then that contaminant is considered a threat for impacting a water-bearing zone. Inorganic contaminants are considered a threat to impact a water-bearing zone if the maximum concentration exceeds its SSL ***and*** its background RC.

6.2.2 Soil-to-Air Cross-Media Transport

To evaluate the potential for soil-to-air migration of volatile contaminants, a screening approach was used to focus on contaminants with the greatest potential to volatilize in sufficient quantities to create a human health threat in ambient air. The screening process may be summarized as follows:

- Quantitative — The maximum concentrations of volatile contaminants detected in surface soil at each SWMU were compared to soil-to-air screening levels as presented in the *USEPA Region III RBC Table*, June 1996.

  No qualitative screening was performed because ambient air sampling was not part of the RFI at each SWMU.

If soil concentrations do not exceed soil-to-air volatilization screening levels, it was assumed that no significant migration potential exists and current surface soil conditions are protective of human health relative to potential inhalation exposure pathways. Other factors considered include type of cover (vegetation, asphalt, etc.), physical properties of the surface soil that might limit or enhance contaminant mobility, and physical/chemical properties of the contaminant class (e.g., VOCs are more likely to volatilize from soil to air than SVOCs).

6.2.3 Surface Soil-to-Sediment Cross-Media Transport

To evaluate the potential for surface soil-to-sediment erosional migration, the following approach was taken:

- Qualitative — Analytical data from both soil and sediment (if sediment samples were taken) were compared to determine which chemicals were present in both media.

  Also, to evaluate the potential for sorbed contaminants in near-surface soil to migrate by erosional processes, contaminants were identified which exhibited characteristics which would render them mobile under erosional processes such as surface water drainage and wind erosion. The most influential process by which sediments are formed is the erosion of denuded surface soil, which eventually collects in depositional areas. Therefore, topography at each SWMU is also used as a screening process in evaluating this transport mechanism as a migration pathway.

Table 6-2
Fate and Transport Properties for
Contaminants Detected in Soil and Groundwater
NSA Mid-South, Assembly F

Parameter	Group	Mw[a] (g/mole)	Density[a] (g/cm^3)	Vapor Pressure[a,b] (mm Hg)	Solubility[a,b] (mg/L)	Henry's Law Constant[b,c] ($atm\text{-}m^3/mole$)	Koc[b,c] (L/kg)	SSL soil to gw[d] (ug/kg)	SSL soil to air[d] (mg/kg)
Acetone	VOC	58.08	7.90e-01	2.70e+02	1.00e+06	3.97e-05	3.70e-01	800	62000
Benzene	VOC	78.11	8.70e-01	9.50e+01	1.80e+03	5.40e-03	5.00e+01	2	0.5
2-Butanone (MEK)	VOC	72.11	8.10e-01	7.80e+01	2.70e+05	4.66e-05	1.23e+00	NDA	NDA
Carbon disulfide	VOC	76.13	1.30e+00	3.00e+02	2.10e+03	1.33e-02	2.95e+02	2,000	11
alpha-Chlordane	PES	409.78	1.60e+00	1.00e-05	5.60e-02	4.80e-05	4.95e+04	500	NDA
Chloromethane	VOC	50.49	9.20e-01	3.80e+03	7.30e+03	8.82e-03	2.51e+01	NDA	NDA
Chrysene	SVOC	228.30	1.27e+00	6.30e-09	1.80e-03	7.26e-20	2.45e+05	8,000	3.6
4,4'-DDD	PES	320.05	1.50e+00	1.00e-06	2.00e-02	2.16e-05	4.37e+04	800	37
4,4'-DDE	PES	319.03	6.49e-06	6.50e-06	4.00e-02	2.34e-05	2.45e+05	3,000	10
4,4'-DDT	PES	354.49	1.60e+00	1.90e-07	5.00e-03	4.89e-05	3.87e+05	2,000	80
Diethylphthalate	SVOC	222.24	1.10e+00	2.00e-03	9.00e+02	8.46e-07	6.92e+01	21,000	520
1,1-Dichloroethane	VOC	98.96	1.20e+00	1.80e+02	5.50e+03	5.45e-03	3.40e+01	1,000	980
1,1-Dichloroethene	VOC	96.94	1.20e+00	5.90e+02	2.30e+03	1.80e-02	6.50e+01	3	0.04
1,2-Dichloroethane	VOC	98.96	1.30e+00	6.40e+01	8.70e+03	9.80e-04	1.41e+01	1	0.3
cis-1,2-Dichloroethene	VOC	96.94	1.20e+00	2.02e+02	8.00e+02	4.08e-03	4.90e-01	30	1500
1,2-Dichloropropane	VOC	112.99	1.16e+00	4.20e+01	2.70e+03	2.94e-03	5.10e+01	1	11

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Table 6-2
Fate and Transport Properties for
Contaminants Detected in Soil and Groundwater
NSA Mid-South, Assembly F

Parameter	Group	Mw[a] (g/mole)	Density[a] (g/cm^3)	Vapor Pressure[a,b] (mm Hg)	Solubility[a,b] (mg/L)	Henry's Law Constant[b,c] ($atm\text{-}m^3/mole$)	Koc[b,c] (L/kg)	SSL soil to gw[d] (ug/kg)	SSL soil to air[d] (mg/kg)
Endosulfan II	PES	406.92	1.70e+00	1.00e-05	2.80e-01	1.91e-05	2.34e+03	900	1
Endrin	PES	380.92	1.70e+00	7.00e-07	2.30e-01	5.00e-07	8.32e+03	50	16
Endrin aldehyde	PES	380.92	1.70e+00	2.00e-07	2.60e-01	3.86e-07	2.69e+04	NDA	NDA
Ethylbenzene	VOC	106.16	8.70e-01	7.10e+00	1.50e+02	6.60e-03	1.87e+02	700	260
bis(2-Ethylhexyl)phthalate (BEHP)	SVOC	340.57	9.90e-01	2.00e-07	3.00e-01	1.10e-05	1.00e+05	180,000	210
Heptachlor epoxide	PES	389.32	NDA	2.60e-06	3.50e-01	3.20e-05	2.09e+04	30	1
2-Methylnaphthalene	SVOC	142.21	1.00e+00	NDA	2.50e+01	NDA	8.51e+03	NDA	NDA
4-Methyl-2-Pentanone (MIBK)	VOC	100.16	8.00e-01	1.50e+01	1.70e+04	1.49e-05	6.17e+00	NDA	NDA
Methylene chloride	VOC	84.93	1.30e+00	3.50e+02	2.00e+04	2.00e-03	2.30e+01	1	7
Naphthalene	SVOC	128.18	1.10e+00	5.40e-02	3.00e+01	4.60e-04	7.92e+02	4,000	180
Phenanthrene	SVOC	178.24	1.20e+00	6.80e-04	1.00e+00	3.90e-05	2.29e+04	NDA	NDA
Pyrene	SVOC	202.26	1.30e+00	2.50e-06	1.40e-01	1.09e-05	6.46e+04	210,000	56
Styrene	VOC	104.15	9.06e-01	5.00e+00	3.00e+02	2.61e-03	7.41e+02	200	NDA
Toluene	VOC	92.13	8.70e-01	2.20e+01	5.20e+02	6.70e-03	1.29e+02	600	520

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Table 6-2
Fate and Transport Properties for
Contaminants Detected in Soil and Groundwater
NSA Mid-South, Assembly F

Parameter	Group	Mw[a] (g/mole)	Density[a] (g/cm^3)	Vapor Pressure[a,b] (mm Hg)	Solubility[a,b] (mg/L)	Henry's Law Constant[b,c] ($atm\text{-}m^3/mole$)	Koc[b,c] (L/kg)	SSL soil to gw[d] (ug/kg)	SSL soil to air[d] (mg/kg)
Tetrachloroethene	VOC	165.83	1.60e+00	1.40e+01	1.50e+02	1.53e-02	2.64e+02	3	11
Trichloroethene	VOC	131.40	1.50e+00	5.80e+01	1.10e+03	9.10e-03	8.70e+01	3	3
1,1,1-Trichloroethane	VOC	133.40	1.30e+00	1.00e+02	1.60e+03	1.62e-02	1.28e+02	100	980
1.1.2-Trichloroethane	VOC	133.40	1.44e+00	1.90e+01	4.50e+03	7.40e-04	5.60e+01	0.9	0.8
Xylene	VOC	106.17	8.80e-01	8.70e+00	2.00e+02	7.10e-03	2.34e+02	NDA	320
Antimony	INO	121.80	NDA	NDA	NDA	NDA	NDA	300	NDA
Arsenic	INO	74.90	NDA	NDA	NDA	NDA	NDA	1,000	380
Barium	INO	137.33	NDA	NDA	NDA	NDA	NDA	82,000	350,000
Beryllium	INO	9.01	NDA	NDA	NDA	NDA	NDA	3,000	690
Cadmium	INO	112.40	NDA	NDA	NDA	NDA	NDA	400	920
Chromium	INO	52.00	NDA	NDA	NDA	NDA	NDA	2,000	NDA
Cobalt	INO	58.93	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Copper	INO	63.55	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Lead	INO	207.20	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Mercury	INO	200.60	NDA	NDA	NDA	NDA	NDA	NDA	7
Nickel	INO	58.71	NDA	NDA	NDA	NDA	NDA	7,000	6900
Selenium	INO	78.96	NDA	NDA	NDA	NDA	NDA	300	NDA

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Table 6-2
Fate and Transport Properties for
Contaminants Detected in Soil and Groundwater
NSA Mid-South, Assembly F

Parameter	Group	Mw[a] (g/mole)	Density[a] (g/cm^3)	Vapor Pressure[a,b] (mm Hg)	Solubility[a,b] (mg/L)	Henry's Law Constant[b,c] ($atm\text{-}m^3/mole$)	Koc[b,c] (L/kg)	SSL soil to gw[d] (ug/kg)	SSL soil to air[d] (mg/kg)
Silver	INO	107.90	NDA	NDA	NDA	NDA	NDA	2,000	NDA
Tin	INO	118.69	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Vanadium	INO	50.94	NDA	NDA	NDA	NDA	NDA	300,000	NDA
Zinc	INO	65.38	NDA	NDA	NDA	NDA	NDA	620,000	NDA

Notes:

a — Merck & Co., *The Merck Index*, Merck & Co., Rahway NJ, 1983.
Lide, *CRC Handbook of Chemistry and Physics*, CRC Press, Boca Raton, 1994.
USEPA, *Treatability Database*, USEPA Risk Reduction Engineering Laboratory, Cincinnati OH, 1992.
Resource Consultants, *Chemtox Release K*, 1985-1995.
b — Howard, *Fate and Exposure Data*, Lewis Publishers, Chelsea MI, 1993.
c — Knox, Sabatini, Canter, *Subsurface Transport and Fate Processes*, Lewis Publishers, Chelsea MI, 1993.
d — USEPA, *Soil Screening Guidance Technical Background Document*, Publication 9355.4-17A, OSWER USEPA Washington DC, 1996.
NDA — No Data Available
VOC — Volatile Organic Compound
SVOC — Semivolatile Organic Compound
PES — Pesticide
INO — Inorganic

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6.3 Site-Specific Fate and Transport Introduction

The Assembly F fate and transport approach was discussed in Section 6.2. The following sections apply that approach to each SWMU. Because SWMUs 22 and 63 are so close to SWMU 39, the transport processes for these sites were assessed as one unit in the SWMU 39 discussion. Transport processes for constituents other than those designated as COCs will also be discussed if those constituents are located in multiple environmental media, or have the potential to migrate to other media.

6.3.1 SWMU 17

SWMU 17 is the former location of an underground tank in the Building S-9 complex. The former tank is reported to have received used automotive oil and used hydraulic fluid generated during automobile maintenance. SWMU 17 is approximately 100 feet east of First Avenue on the NSA Mid-South Southside in the Building S-9 complex. The immediate area is covered by asphalt and descends slightly to the south and west toward a north-south drainage ditch, which flows southward into Big Creek Drainage Canal. No samples were collected outside the asphalt covered area.

Soil-to-Groundwater Cross-Media Transport

The only constituent detected in both soil and groundwater at SWMU 17 was benzene, which was detected in fluvial deposits groundwater in one sample, and detected in soil at depths of 13 to 15 feet below land surface at three of the nine sample locations. Benzene ranged from 2.3 to 3.3 μg/kg in soil, which exceed its SSL. Based on the frequency of benzene detections, and SSL exceedances in the subsurface sampling intervals, it may leach to groundwater. However, samples from only one of five groundwater locations indicated that benzene is present in groundwater. Because benzene is a VOC, its chemical and physical properties promote the possibility for soil-to-groundwater leaching.

Other groundwater constituents at SWMU 17 are 1,1,1-trichloroethane and 1,2-dichloropropane, which were both detected in only one of five groundwater samples, although neither was detected in soil. Their relatively high solubility values make both constituents very mobile in groundwater. Each of these contaminants will tend to move with groundwater flow; however, the chemical and physical properties of VOCs in general increase the potential for these compounds to degrade and each tend to have relatively short half-lives in groundwater. At SWMU 17, contaminant transport is probably by advective flow, the process by which dissolved substances migrate with moving groundwater, typically in the direction of the hydraulic gradient. Widespread impacts to the saturated zone are not expected though, as the groundwater velocity is slow and VOC degradation is likely.

Other SWMU 17 contaminants that exhibit the potential for soil-to-groundwater transport, based on comparison of soil concentrations to the groundwater protection soil screening criteria, are the VOC tetrachloroethene, the SVOC naphthalene, and the inorganics antimony, arsenic, barium, cadmium, chromium, nickel, and selenium.

Tetrachloroethene was detected at two different sample depths in concentrations ranging from 1.6 to 17 μg/kg, but only exceeded its SSL at the 0- to 1-foot interval. Presently, tetrachloroethene has not been detected in SWMU 17 groundwater. Although the conservative screening process has indicated the potential for isolated soil-to-groundwater tetrachloroethene migration, widespread impacts to the shallow aquifer are not expected based on the concentrations in surface and subsurface soil.

Naphthalene exceeded its SSL in one sample location at the 0- to 1-foot depth interval, and was not detected in subsurface soil samples. The potential for naphthalene to migrate to groundwater is not likely due to its low solubility, vapor pressure, and Henry's law constant. Overall,

naphthalene is anticipated to be immobile and persistent in the environment, not readily diffusing into groundwater.

TPH was detected in six subsurface soil samples at concentrations ranging from 66,000 to 320,000 μg/kg. There is no established soil-to-groundwater SSL for TPH; however, the TDEC remediation goal (RG) for TPH at SWMU 17 is 100,000 µg/kg. TPH exceeded the TDEC RG in five subsurface soil samples. Currently, TPH has not been identified in groundwater at SWMU 17. Its chemical and physical properties are similar to those in SVOCs and it is expected to be relatively immobile in soil, as it tends to associate with the solid phase (soil particles) rather than the dissolved phase.

Of the seven inorganics exceeding their soil-to-groundwater SSLs, only antimony, nickel, and selenium also exceeded background RCs. The remaining inorganics which did not exceed their background RC may be considered naturally occurring. Antimony, nickel, and selenium exceeded their soil-to-groundwater SSLs, as well as their subsurface soil background RC. Current groundwater results indicate that these inorganics are not a soil to groundwater migration concern; however, the potential exists for leaching to groundwater based on the SSL exceedence. Conditions that promote mobility in the subsurface include an acidic, sandy soil with low organic and clay content. Subsurface soil at the site is classified as a loess (silty clay), which is not specifically sandy.

Soil-to-Sediment Cross-Media Transport

For discussion, contaminants which were detected in near-surface soil were evaluated to determine their potential for transport by erosional processes in the gravel and asphalt-covered areas should this cover be removed. SWMU 17 drainage patterns and topography were also examined to see if site features would support contaminant transport.

Contaminants detected in surface soil consist of VOCs, SVOCs, pesticides, and inorganics. As described in Section 6.1.1,VOCs have a limited tendency to adsorb to solids and are more likely to volatilize to the atmosphere or leach to groundwater before moving with soil particles. In general, pesticides tend to sorb to soil particles and are relatively immobile in the environment, leading to a likelihood of greater persistence but lower mobility in the environment than VOCs. Inorganic chemicals do not degrade, but may change chemical form or speciation in the environment. Like pesticides, inorganics tend to sorb to soil particles, rendering them immobile except when soil particles become mobile.

Drainage patterns and cover at SWMU 17 leave little potential for contaminants in surface soil to form sediments and become mobile during precipitation. Therefore, soil-to-sediment transport at SWMU 17 is not an important process.

6.3.2 SWMU 19

SWMU 19 is reported to have operated as a UST, and data collected during the removal of the UST indicate a release may have occurred prior to removal. SWMU 19 and the surrounding area, which are on the NSA Mid-South Northside are characterized by relatively level, low-relief topography. The immediate area is covered with asphalt and descends slightly to the west and northwest toward two storm drains and a wooded area to the north. Migration of surface constituents by surface water erosion will be insignificant for SWMU 19 due to the asphalt-covered areas, and the general flatness of the site. The lack of any significant VOC contamination in surface soil indicates that the soil-to-air cross-media transport process is not important. Also, no VOC in surface soil exceeded its soil-to-air SSL.

Soil-to-Groundwater Cross-Media Transport

Of the nine VOCs detected in soil at SWMU 19, only 4-methyl-2-pentanone (MIBK) was also detected in groundwater at SWMU 19. MIBK was detected at one of two soil sample locations

in the 0- to 1-foot interval, and one of four locations in the 13- to 15-foot interval. However, no samples at these sampling locations had concentrations exceeding MIBK's SSL.

Benzene, toluene, ethylbenzene, and xylenes soil detections exceeded the groundwater protection risk-based screening levels, but were not detected in groundwater at SWMU 19. SSL exceedances for benzene, toluene, ethylbenzene, and xylenes were present only in surface soil sample locations. Subsurface soil concentrations were either non detect or below the SSL. Based on the frequency of these contaminants detections and their absence in subsurface soil and groundwater at this time, widespread impact to the shallow aquifer is not expected.

Of the six SVOCs detected in soil, only naphthalene exceeded its SSL. It was detected at the 0-to 1-foot depth interval, but not in subsurface soil samples. The potential for naphthalene to migrate to groundwater is not likely due to its low solubility, vapor pressure, and Henry's law constant, properties that enhance its likelihood of persisting in the environment longer than VOCs. Overall, naphthalene is anticipated to be immobile, not readily diffusing into groundwater.

At SWMU 19, 15 inorganics were detected in soil. Of these 15 inorganics, only selenium exceeded both its soil-to-groundwater SSL and background RC. The exceedances were at two sampling locations at the 0- to 1-foot interval. Selenium was not detected in SWMU 19 groundwater, and even though its soil-to-groundwater SSL was exceeded, impact to loess or fluvial groundwater is not expected. Arsenic, barium, cadmium, chromium, and nickel all exceeded their soil-to-groundwater SSLs, but not exceed their background RCs. These inorganics are considered to be naturally occurring.

Soil-to-Sediment Cross-Media Transport

SWMU 19 surface soil contaminants include VOCs, SVOCs, and inorganics, which are more persistent in the environment and do not degrade readily. As described earlier, SWMU 19 is

relatively flat and covered with asphalt, which means it has no obvious runoff pathway and suggests that creation of sediment due to erosion is at the very least minimal. The soil particles would have to become mobile through some erosional process.

In the absence of VOCs, the remaining contaminant classes have properties that increase their affinity for soil particles. In short, if SWMU 19 surface soil becomes eroded and mobile, these contaminants will likely be mobile also. However, because the immediate area is asphalt-covered, the potential for soil particle movement decreases. Also, relative to VOCs, SVOCs and inorganics are persistent in the environment; therefore, they are not likely to degrade in soil and will not readily diffuse into water (surface or groundwater).

6.3.3 SWMU 20

SWMU 20 (abandoned underground waste tank 1594) is on the NSA Mid-South Southside. The estimated size of the tank was 100 gallons, and it was removed in May 1992. SWMU 20 is covered by asphalt, while surrounding areas have grass cover. Surface drainage is toward the south and west to a drainage ditch (SWMU 38).

As part of the base realignment, Building 1594 was demolished and the SWMU 20 area subsequently repaved to provide parking for Building S-769. The parking lot construction grade was not changed.

The migration pathway for SWMU 20 constituents is predominantly soil to groundwater. The potential for soil-to-sediment cross-media transport is less prominent at this SWMU based on the type of cover and relief in the immediate area. Surface soil samples were not collected at SWMU 20; therefore, this pathway is not discussed.

Soil-to-Groundwater Cross-Media Transport

The following contaminants exceeded their soil-to-groundwater SSL in subsurface soil at SWMU 20: 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,1-dichloroethene, 1,2-dichloropropane, benzene, methylene chloride, tetrachloroethene, and trichloroethene. No surface soil samples were collected at SWMU 20. Based on the chemical and physical properties of the VOCs above, these contaminants are expected to be mobile in the environment (soil and groundwater). They have the potential to leach to groundwater and move with groundwater flow; however, none of the contaminants were detected in SWMU 20 groundwater.

The only contaminants detected in groundwater were acetone, and 2-butanone (MEK). Both were detected in soil; however, neither exceeded its soil-to-groundwater SSL.

The only other contaminants detected in SWMU 20 soil were VOCs, because they were the only parameters sampled for. Based on the relatively low concentrations of these contaminants in soil and the fact they did not exceed their soil-to-groundwater SSL, leaching to underlying groundwater is not expected.

Soil-to-Sediment Cross-Media Transport

No surface soil samples were collected at SWMU 20; therefore, it is not possible to assess the soil-to-sediment migration pathway.

6.3.4 SWMU 39

SWMU 39 consists of the area surrounding the former location of Buildings S-74 and S-75. Building S-74 was demolished in 1995 and a concrete slab is all that remains. Transformers and drums of oil were stored outside of Building S-74 on a concrete slab until the building was demolished. SWMUs 22 and 63, which are associated with Building S-75, are adjacent, and hydraulically downgradient of SWMU 39.

The SWMU 39 area is situated on relatively level, low-relief topography. Areas adjacent to the concrete slab are covered with grass. Surface water drains toward the south and west to a north-south oriented drainage ditch (associated with SWMU 38) and ultimately flows into the Big Creek Drainage Canal.

Migration of constituents by surface water erosion of surface soil will be less significant for SWMU 39 due to the presence of vegetated areas. Also, the concrete slab will mitigate potential migration through the soil-to-groundwater pathway and soil-to-sediment pathway because it limits rainwater infiltration and acts as a horizontal barrier. No VOC in surface soil exceeded its soil-to-air SSL.

Soil-to-Groundwater Cross-Media Transport

Contaminants detected in loess groundwater include the following: 1,2-dichloroethene, 4-methyl-2-pentanone, benzene, ethylbenzene, toluene, and xylene. Only ethylbenzene, toluene, and xylene were also detected in soil also. Ethylbenzene and xylene were detected in surface and subsurface soil, and toluene was detected in surface soil only. None of these contaminants exceeded its soil-to-groundwater SSL in SWMU 39 soil. Even though the soil-to-groundwater SSLs of these contaminants have not been exceeded, groundwater data indicate that these contaminants have migrated through soil to loess groundwater; however, groundwater detections were found at only one sample location. Only 1,2-dichloroethene exceeded a regulatory limit in groundwater. It exceeded its tap-water RBC (0.36 μg/L) at a concentration of 2 μg/L.

In fluvial deposits groundwater screening samples, only 2-butanone, acetone, cis-1,2-dichloroethene, ethylbenzene, toluene, trichloroethene, and xylene were also detected in soil samples. 2-Butanone was detected in surface soil samples only at two of five locations. Acetone was detected at only one location and sample interval (9 to 11 feet). Ethylbenzene was detected at two of five surface sample locations and the only subsurface locations (9 to 11 feet).

Cis-1,2-dichloroethene, toluene, and trichloroethene were detected in surface samples only at two of five locations. Xylene was also detected at two of five surface sample locations and at one subsurface sample location (11 to 13 feet). Only trichloroethene exceeded its soil-to-groundwater SSL (at the 0- to 1-foot sample interval), and exceeded its groundwater MCL. Tetrachloroethene was the only other contaminant which exceeded its soil-to-groundwater SSL in SWMU 39 soil. Its SSL was exceeded at the 0- to 1-foot interval; however, it was not detected in subsurface soil samples or loess or fluvial deposits groundwater. The relatively low frequency of VOC detection in soil indicates contamination in soil is probably isolated and not widespread across SWMU 39. VOCs that have reached groundwater are expected to move with groundwater flow; however, VOCs general chemical and physical properties increase the potential for these compounds to degrade and each tend to have relatively short half-lives in groundwater.

Contaminants detected in fluvial deposits groundwater collected from SWMU 39 monitoring wells include the following: acetone, 1,2-dichloroethene, carbon disulfide, chloromethane, cis-1,2-dichloroethene, toluene, trichloroethene, and xylene. Of these contaminants, acetone, cis-1,2-dichloroethene, toluene, trichloroethene, and xylene were also detected in soil at SWMU 39. Acetone, ethylbenzene, and xylene were detected in subsurface soil samples; the remaining were detected in surface samples only. The absence of 2-butanone, cis-1,2-dichloroethene, toluene, and trichloroethene in subsurface samples may be attributed to their limited tendency to adsorb to solids and their somewhat low concentrations at the surface (supposed release area). Only trichloroethene, detected at the 0- to 1-foot interval in soil exceeded its soil-to-groundwater SSL. Each well was sampled at three different depths: 40 to 69, 70 to 89, and 90 to 109 feet. The most frequent detections of the above-mentioned contaminants occurred at a sampling depth of 40 to 69 feet. As expected, trichloroethene and 1,2-dichloroethene were detected throughout the sampling column. Because they are denser than water, they may be dispersing throughout the water column. However, these detections were only minor (one in nine at 70 to 89 feet, and one in five at 90 to 109 feet). Trichloroethene exceeded its

MCL at all sample locations. Trichloroethene was not detected in loess groundwater screening samples. Volatility and solubility of these groundwater contaminants are properties with the greatest influence on environmental transport.

With relatively high water solubilities, the main transport processes for these VOCs may be influenced by diffusion and dispersion. Volatility also has an influence on their environmental transport. In unsaturated soil, they can migrate via diffusion through soil-air pore spaces to the surface. Upon reaching groundwater, flow by advection is probably the dominant transport process at SWMU 39, meaning the contaminants will move in the direction of groundwater flow. However, diffusion is likely occurring also, mainly in fluvial deposits groundwater. This is the process where contaminants move from a region of high concentration to a region of low concentration. This typically occurs in finer sediments, or more homogeneous aquifers. In the loess, advection is probably the dominant process, but dispersion may also be occurring. Because the loess groundwater is more heterogeneous than the fluvial deposits, contaminants in loess groundwater will disperse, or be transported due to the heterogeneity of the aquifer.

VOCs detected in SWMU 39 groundwater also have a high vapor pressure and low adsorption to soil. Therefore, VOCs in solution would not be expected to adsorb significantly to soil. This is evident at the site, i.e., acetone, 2-butanone, cis-1,2-dichloroethene, ethylbenzene, toluene, trichloroethene, and xylene were detected in groundwater and were either non detect or present at low concentrations in subsurface soil.

Dense non aqueous phase liquids (DNAPLs) such as trichloroethene have a specific gravity greater than that of water, indicating that in a phase separate from groundwater DNAPLs will generally sink in the subsurface environment, or be found throughout the groundwater column at varying depths. The absence of trichloroethene in most of the subsurface soil samples may be attributed to its relatively low K_{oc} value, which limits its tendency to adsorb to solids.

Soil-to-Sediment Cross-Media Transport

Near-surface soil samples were collected at SWMU 39 and analyzed for VOCs only. If surface soil at SWMU 39 becomes eroded and mobile, these contaminants will likely be mobile also. Especially in near-surface soils, VOCs can migrate via diffusion through soil-air pore spaces to the ground surface, where they can be transported by wind; however, since surrounding areas are covered, the potential for soil particle movement decreases.

Table 6-3
Fate and Transport Summary

Site	Fate/Transport COC	Affected Media	Summary
17	Benzene	Soil Groundwater	- detected in both soil and GW - relatively mobile - low frequency of detections in GW
	1,1,1-Trichloroethane	Groundwater	- low frequency of detections in GW
	1,2-Dichloropropane	Groundwater	- low frequency of detections in GW - not detected in soil
	Tetrachloroethene	Soil	- Isolated - not detected in GW
	Naphthalene	Soil	- relatively immobile/persistent - does not readily diffuse into GW - not detected in GW
	Antimony	Soil	- relatively immobile under site conditions - not detected in GW
	Arsenic	Soil	- relatively immobile under site conditions - not detected in GW
	Barium	Soil	- relatively immobile under site conditions - not detected in GW
	Cadmium	Soil	- relatively immobile under site conditions - not detected in GW
	Chromium	Soil	- relatively immobile under site conditions - not detected in GW
	Nickel	Soil	- relatively immobile under site conditions - not detected in GW
	Selenium	Soil	- relatively immobile under site conditions - not detected in GW

Table 6-3
Fate and Transport Summary

Site	Fate/Transport COC	Affected Media	Summary
19	4-methyl-2-pentanone (MIBK)	Soil Groundwater	- detected in both soil and GW - relatively mobile low frequency of detections in GW
	Benzene	Soil	- detected in surface soil only - low frequency of detection
	Toluene	Soil	- detected in surface soil only - low frequency of detection
	Ethylbenzene	Soil	- detected in surface soil only - low frequency of detection
	Xylene	Soil	- detected in surface soil only - low frequency of detection
	Naphthalene	Soil	- low frequency of detection - relatively immobile under site conditions
	Selenium	Soil	- relatively immobile under site conditions - not detected in GW
20	1,1,1-trichloroethane	Soil	- not detected in GW
	1,1,2-trichloroethane	Soil	- not detected in GW
	1,1-dichloroethane	Soil	- not detected in GW
	1,2-dichloropropane	Soil	- not detected in GW
	Benzene	Soil	- not detected in GW
	Methylene Chloride	Soil	- not detected in GW
	Tetrachlorethene	Soil	- not detected in GW
	Trichloroethene	Soil	- not detected in GW
	Acetone	Groundwater Soil	- low frequency of detections in GW
	MEK	Groundwater Soil	- low frequency of detections in GW

Table 6-3
Fate and Transport Summary

Site	Fate/Transport COC	Affected Media	Summary
39	1,2-dichloroethene	Loess Groundwater	- does not exceed MCL
	4-methyl-2-pentanone	Loess Groundwater	- does not exceed MCL
	Benzene	Loess Groundwater	- does not exceed MCL
	Ethylbenzene	Loess Groundwater Soil	- does not exceed MCL
	Toluene	Loess Groundwater Soil	- does not exceed MCL
	Xylene	Loess Groundwater Soil	- does not exceed MCL
	1,2-dichloroethane	Fluvial Deposits Groundwater	
	Acetone	Fluvial Deposits Groundwater Soil	- Detected in Soil
	MEK	Fluvial Deposits Groundwater Soil	- Detected in Soil
	Chloromethane	Fluvial Deposits Groundwater	
	cis-1,2-dichloroethene	Fluvial Deposits Groundwater Soil	- Detected in Soil
	Ethylbenzene	Fluvial Deposits Groundwater Soil	- Detected in Soil
	Naphthalene	Fluvial Deposits Groundwater	
	Toluene	Fluvial Deposits Groundwater Soil	- Detected in Soil
	Trichloroethene	Fluvial Deposits Groundwater Soil	- Detected in Soil - Relatively mobile - High Solubility
	Xylene	Fluvial Deposits Groundwater Soil	- Detected in Soil
	Tetrachloroethene	Soil	- Not detected in Groundwater

7.0 ECOLOGICAL RISK ASSESSMENT

An ecological risk assessment (ERA) evaluates the actual or potential effects to ecological receptors due to contamination. The terrestrial ecosystem associated with NSA Mid-South Assembly F SWMUs is the focus of this ERA, which considers exposure pathways that could result in unacceptable levels of exposure to ecological receptors now or in the future. The approach to this assessment is based on USEPA's *Risk Assessment Guidance for Superfund Volume II — Environmental Evaluation Manual* (1989) and USEPA's *Framework for Ecological Risk Assessment* (USEPA/630/R-92/001), and USEPA's *Ecological Risk Guidance for Superfund: Process for Designing and Conducting Ecological Risk Interim Final (1997).*

Evaluating potential exposure pathways is one of the primary tasks of the site's screening-level ecological characterization. For an exposure pathway to be complete, a contaminant must be able to travel from the source to ecological receptors and to be taken up by the receptors via at least one exposure route. No complete exposure pathways exist for the SWMUs due to the lack of habitat and receptors. Therefore no ecological risk assessment is recommended for any of the Assembly F SWMUs.

7.1 SWMU 17

This former underground tank (S-9) is reported to have received used automotive oil and used hydraulic fluid generated during automobile maintenance at Building S-9. The immediate area is covered by gravel or asphalt and descends slightly southwest toward a drainage ditch (SWMU 38), which flows southward into Big Creek Drainage Canal.

7.2 SWMU 19

SWMU 19 is a former hazardous-waste accumulation point for Building N-757. It is reported to have operated as a UST from 1983 to 1992. Data collected during the removal of UST 1648 indicate that a release may have occurred before removal. SWMU 19 is covered by asphalt.

7.3 SWMU 20

SWMU 20 is the location for an abandoned UWT 1594. The site and the surrounding area consist of a asphalt parking lot and Building 1594.

7.4 SWMU 22

SWMU 22 consists of four USTs west of Building S-75 that were installed in approximately 1944. USTs 1244, 1245, and 1246 stored fuel oil for the boiler plant and one unnumbered UST stored diesel fuel. The tanks were removed at an unknown date. The site is in the developed areas of the base and consist of graveled areas surrounded by streets with no quality habitat available.

7.5 SWMU 39

SWMU 39 consists of a concrete slab that was the former foundation of Building S-74. After demolition of the building, transformers and drums of oil were stored on the slab. The area is covered by grass/gravel and the aforementioned concrete slab.

7.6 SWMU 63

SWMU 63 consists of an approximately 7-foot by 7.5-foot area adjacent to the southwest corner of Building S-75 that is the former location of a 65-gallon, stainless-steel UWT. The UWT was removed in April 1992. The area is covered by either gravel, concrete or asphalt.

8.0 HUMAN HEALTH RISK ASSESSMENT

8.1 Introduction

This human health risk assessment (HHRA) evaluates the potential impact to human health that may be related to chemicals detected at Assembly F SWMUs 17, 19, 20, 22, 39, and 63.

The baseline HHRA for the six SWMUs was based on analytical data from the Confirmatory Sampling Investigations (CSIs) and this RFI and is presented in Appendix C. By using data from the CSI, direct push technology (DPT) data has been used to assess risk. For this RFI, CSI data is only discussed in detail in the HHRA. The CSI reports provide conclusions and recommendations from this sampling event (EnSafe, 1998, 1999). Although this data is not generally used to assess risk, it was included because of the limited amount of data from the RFI.

The methods used in this assessment are discussed in EnSafe's February 4, 1997, Technical Memorandum, *Revision 1: General Human Health Risk Assessment (HHRA) Approach for NSA Memphis*, (E/A&H, 1997) (Appendix D). In addition, information from published literature or federal, state, and local agencies was incorporated into the HHRA.

8.1.1 Risk Assessment Organization

This HHRA is organized as outline below.

- Data Compilation (Section 8.2)
- Data Evaluation and COPCs Selection (Section 8.3)
- Exposure Assessment (Section 8.4)
- Toxicity Assessment (Section 8.5)
- Risk Characterization (Section 8.6)
- Risk Uncertainty Discussion (Section 8.7)
- Remedial Goal Option Derivation (Section 8.8)

8.2 Data Compilation

The analytical data from each field investigation were reviewed in order to (1) validate and organize sampling data that are of acceptable quality for use in the detailed HHRA, and (2) identify a set of COPCs. Sections 8.2.1 through 8.2.4 outline the methods used to evaluate data quality.

8.2.1 Data Tabulation

The analytical results were tabulated and grouped by SWMU and environmental media of concern. Additionally, SWMU 39 groundwater was evaluated as two groundwater bearing units: loess groundwater (less than 30 feet bgs) and fluvial deposits groundwater (greater than 30 feet bgs). Summary tables, which are provided at the conclusion of the HHRA text, present descriptive statistics, such as the frequency of detection, the range of detected concentrations and detection limits, and average detected concentration.

8.2.2 Data Set Development

This section describes how the data set wa developed and defines the data qualifiers assigned to analytical results in the third-party review process.

8.2.3 Qualified Data

The table below shows the approach used to review data with qualifiers pertaining to quality assurance/quality control (QA/QC) problems, and select data to be addressed qualitatively in the HHRA.

Qualified Data

Qualifier	Definition	Use of Qualified Data In HHRA
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit (SQL).	If the analyte is selected as a COPC depending on the size of the data set, it may be assumed to be present at one-half the SQL.
J	The analyte was positively identified; however, the associated numerical value is an estimate of the concentration of the analyte in the sample.	If the analyte is selected as a COPC, it will be assumed to be present at the estimated concentration.
UJ	The analyte was not detected above the reported SQL. However, the reported quantitation limit is an estimate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	If the analyte is selected as a COPC, it will be assumed to be present at one-half the SQL.
D	The organic compound was re-analyzed and reported at a secondary dilution factor.	If the analyte is selected as a COPC, it will be assumed to be present at the concentration reported.
UR/R	The sample results are rejected, and therefore unusable because of serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.	Data will not be included in the quantitative risk assessment.

Note:
Source: USEPA, 1989

8.2.4 Detection Frequency

Any chemical detected in fewer than 5% of samples was eliminated as a COPC, if enough samples had been collected for analyses and the chemical has not been detected in more than one medium. Based on *Risk Assessment Guidance for Superfund* RAGS, Part A (USEPA, 1989), at least 20 samples would be needed if a detection frequency of 5% is used as one criterion for eliminating compounds from further consideration in the HHRA. Chemicals detected infrequently, but at high

concentrations will be evaluated to determine whether they represent an isolated hot spot before excluding them from the HHRA.

8.3 Data Evaluation and Chemicals of Potential Concern Selection

This section explains the methodology used to review existing data and select COPCs for further evaluation in the HHRA.

8.3.1 Comparison with Background Concentrations

According to RAGS, Part A and USEPA Region 4 guidance, an inorganic chemical may be excluded from further consideration if the maximum detected concentration is less than naturally occurring background. This HHRA, an inorganic chemical was not carried through the quantitative HHRA process if its maximum detected concentration was below site-specific background or reference concentrations (RC) as presented in EnSafe/Allen & Hoshall's (E/A&H) August 27, 1996, *Reference Concentration* technical memorandum.

8.3.2 Risk-based Screening Approach

Although many chemicals may be identified in site investigative samples, a baseline HHRA's results are typically driven by a few chemicals and exposure pathways. To streamline the risk assessment process and focus efforts on important issues, the regulatory agencies and the scientific community have developed several methods to identify chemicals and pathways that contribute significantly to the total site risks. A tiered, risk-based approach was used to select COPCs, based on USEPA-developed methodology and standard risk assessment procedures.

COPCs were selected by comparing the maximum detected concentration of all detected analytes to their appropriate RBC, surrogate screening concentration (as necessary), and applicable reference concentration, which were obtained from the October 1999 USEPA *Region 3 Risk-based Screening Concentration Table*. Groundwater results were compared to tap-water screening

values, surface soil results were compared to residential soil RBCs, and results from all depths were compared to residential and industrial soil screening values. RBCs were adjusted to reflect a target hazard quotient (HQ) of 0.1 for noncarcinogens in accordance with USEPA Region 4 *Supplemental Guidance to RAGS* (USEPA, 1995).

Alternative screening concentrations were selected for lead. Lead concentrations exceeding RCs were compared to a screening level of 400 mg/kg, which is considered protective of resident children (USEPA, 1994).

8.3.3 Identification of Soil COPCs

Surface Soil

The surface soil RBCs correspond to a residential scenario and a cancer risk (CR) level of 1E-06 or an HQ of 0.1. Soil RBCs were taken from the October 1999 USEPA Region 3 *Risk-based Concentration Table*. Chemicals present in each Assembly F SWMU and COPCs identified for surface soil are shown in Tables 8-1 through 8-5. The surface soil COPCs are antimony (SWMU 17), arsenic and BEQ (SWMU 22), and dieldrin (SWMU 39). There were no chemicals detected in the soil samples for SWMU 63. Because no COPCs were identified for SWMU 19, 20, and 63 surface soil for these SWMUs will not be addressed further.

Because the carcinogenic PAHs have toxic mechanisms similar to benzo(a)pyrene (BAP), and USEPA recommends addressing them in accordance with *Provisional Guidance for Quantitative Risk Assessment of Polycylic Aromatic Hydrocarbons* (USEPA, 1993), all carcinogenic PAHs will be evaluated in this HHRA. The seven PAHs addressed in this guidance are listed here with their corresponding

PAH	TEF
Benzo(a)anthracene	0.1
Benzo(b)fluoranthene	0.1
Dibenz(a,h)anthracene	1
Benzo(k)fluoranthene	0.01
Benzo(a)pyrene	1
Indeno(1,2,3-cd)pyrene	0.1
Chrysene	0.001

toxicity equivalence factor (TEF). Toxicological studies provide the basis for treating these PAHs relative to BAP; the PAH concentration was multiplied by its respective TEF and summed to obtain the equivalent BAP concentration. The sum of all PAHs treated relative to BAP is designated as the benzo(a)pyrene equivalent (BEQ). Table 8-6 lists all PAHs for SWMU 22 soil. In all subsequent text and tables in this section, BEQs represent the total equivalent concentration of these PAHs.

Subsurface Soil (All Soil Depths)

Because construction workers may be exposed to chemicals in the entire soil column (surface and subsurface soil), a data set of all available soil data was screened against industrial RBCs. Based on the screening comparisons and data presented in Tables 8-7 through 8-12, no COPCs were identified for subsurface soil at SWMUs 17, 19, 20, 39, and 63. Subsurface soil for SWMU 22, was only analyzed for VOCs. There were no VOCs selected as VOCs for this SWMU.

8.3.4 Identification of Groundwater COPCs

Tap-water RBCs corresponding to a CR level of 1E-06 or an HQ of 0.1 were used to identify groundwater COPCs. Tap-water RBCs were taken from the October 1999 USEPA Region 3 *Risk-based Concentration Table*. Chemicals present in each Assembly F SWMU and COPCs identified for groundwater are shown in Tables 8-13 through 8-17. No COPCs were identified for SWMU 19, 22, or 63 groundwater; therefore, this medium for these SWMUs will not be addressed further. COPCs for the remaining SWMUs are presented in Table 8-18.

8.4 Exposure Assessment

The exposure assessment's objective is to estimate the type and magnitude of exposures to COPCs either at or migrating from the Assembly F SWMUs. The exposure setting and land use are detailed in Section 1 of this RFI and will not be discussed here. Data gathered during the field

investigation were integrated into a quantitative expression of COPC intake by potential receptors. Calculation of COPC intake is discussed in the following sections.

8.4.1 Calculation of Exposure Point Concentration

The methodology used to estimate exposure point concentrations (EPCs) for the quantitative risk assessment is described below.

Exposure Point Concentration

The reasonable maximum exposure (RME) concept is defined by USEPA as the maximum exposure that could reasonably be expected to occur at a site. The EPC for an RME scenario is typically calculated by estimating the upper confidence limit, i.e., the 95% UCL of the analytical data's arithmetic mean (Gilbert, 1987). As such, the calculated 95% UCL represents the upper bound of an interval that brackets the true mean 95% of the time, when calculated repeatedly for randomly drawn subsets of site data. Therefore, USEPA considers the 95% UCL to conservatively estimate the average concentration. The 95% UCLs were used in this HHRA when the data set population size was acceptable (USEPA, 1992).

The data set for each SWMU was very limited or there was only one detection in a large data set (>20 samples). Therefore, in most instances, the maximum concentration was selected as the EPC. Generally, the maximum concentration was selected as the EPC if the following conditions were met.

- The dataset's population (n) was less than 10.
- The detection frequency was less than 0.05 (1 detection in 20 samples).

However, for data sets of sufficient size, the 95% UCL was calculated in accordance with USEPA guidance (USEPA, 1992a).

Determination of Data Distribution

To estimate the 95% UCL, the data set must be normally distributed, either in its original or log-transformed format. The steps that will be used to determine data distribution are described below:

1. Tabulate the data set in its original format. Use one-half of the reported quantification limit (i.e., SQL) to represent samples with nondetectable concentrations.

2. Use the Shapiro-Wilkes test (W-test) to determine data distribution.

3. If the results of the W-test indicate that the data set for a chemical is neither normally nor log-normally distributed, then calculate the 95% UCL using the algorithm for a lognormally distributed data set. This approach is consistent with USEPA headquarters' and Region 4's guidance, as provided in USEPA 1992a and 1995, respectively.

It is recognized that a large number of nondetects can skew the data set being tested for distribution because of the use of one-half of the quantification limit to represent samples with nondetectable concentrations. This situation is likely to arise for organic compounds that have been detected at the facility. If enough data points were available, the distribution was tested on detects only, as well as the full data set, and a judgment was made regarding the most reasonable results.

Computation of 95% UCL for the Normally Distributed Data Set

The 95% UCL concentration for a chemical was calculated using the following equation, if the data set was normally distributed in its original format:

Equation 8-1:

$$UCL_{normal} = \left(\bar{x} + \frac{t \times s}{\sqrt{n}} \right)$$

where:

UCL_{normal}	=	95% upper confidence limit of the arithmetic mean
$\bar{x}$	=	arithmetic mean of the data
t	=	student's t-statistic (Gilbert, 1987)
s	=	standard deviation
n	=	number of samples

Computation of the 95% UCL for the Lognormally-distributed Data Set

The 95% UCL concentration for a chemical was calculated based on the following procedures, if the data set was lognormally distributed.

1. Derive the log-transformed data set by calculating the natural logarithm of the original data.

2. Calculate the 95% UCL using the following equation:

Equation 8-2

$$UCL_{lognormal} = \exp\left(\bar{x} + 0.5s^2 + \frac{H \times s}{\sqrt{n-1}} \right)$$

where:

$UCL_{lognormal}$	=	95% upper confidence limit of the arithmetic mean (log-transformed data)
$\bar{x}$	=	arithmetic mean of the log-transformed data
s	=	standard deviation of the transformed data
H	=	H-statistic (Gilbert, 1987)
n	=	number of samples

The State of Washington Department of Ecology MTCAStat statistical software was used to calculate UCL concentrations (WDOE, 1992). A detailed UCL calculation is presented in Tables 8-19A through 8-19D.

Comparing 95% UCL with Maximum Detected Concentration

If the calculated 95% UCL value for a chemical exceeded its maximum detected concentration in a medium, then the maximum detected concentration was adopted as the EPC (USEPA, 1989, 1995). Table 8-20 summarizes the statistical analyses and each SWMU's selected EPCs for surface soil and groundwater. The EPCs were used as inputs to the exposure models used to estimate chronic daily intake (CDI). Exposure models used are detailed in the next two sections.

8.4.2 Identification of Human Receptors

Chemicals move from sources such as soil and water to exposure points where potentially exposed populations may contact the chemicals. The exposure pathways along which they move are typically defined by four components:

- A source and chemical release mechanism to the environment.
- An environmental transport medium (e.g., air, water) for the released chemicals
- A potential contact point with the contaminated medium (i.e., exposure point)
- An exposure route at the exposure point (e.g., inhalation, ingestion, dermal contact)

If all four components are present, an exposure pathway is considered complete. Only complete exposure pathways are evaluated quantitatively in this HHRA.

SWMU 17 consists of an asphalt covered fenced lot used to store landscaping equipment and building S-9 which is used as office space by a landscaping contractor. Because there are no direct

routes to surface soil or contacts points with it, SWMU 17 soil will not be quantitatively evaluated. SWMU 22, which is used for storage, is covered by concrete and gravel. Soil contact may occur at this SWMU, although the likelihood of such contact is minimal. Soil contact at SWMU 22 will be quantitatively evaluated in this HHRA. Because TDEC considers all groundwater potential drinking water, groundwater beneath Assembly F will be quantitatively evaluated.

Human exposure routes for both soil and groundwater at this site are incidental ingestion of soil and dermal contact. Table 8-21, summarizes the exposure pathways considered for Assembly F media and explains the rationale each pathways's inclusion or exclusion.

8.4.3 Quantification of Chemical Intakes

Estimates of exposure to COPCs are required for quantitative risk characterization. The basic equation used to calculate the human intake is as follows:

Equation 8-3:

$$Intake = C \times \frac{CR \times EF \times ED}{BW \times AT}$$

where:

Intake	=	daily intake (milligrams per kilogram per day [mg/kg-day])
C	=	concentration of the chemical (e.g., milligram per kilogram [mg/kg] in soil and milligram per liter [mg/L] in water)
CR	=	contact rate; the amount of contaminated medium contacted over the exposure period (e.g., milligram per day [mg/day] for soil and liters per day [L/day] for water)
EF	=	exposure frequency; describes how often exposure occurs (days/year)
ED	=	exposure duration; describes how long exposure occurs (years)
BW	=	body weight; the average body weight over the exposure period (kilograms [kg])
AT	=	averaging time; period over which exposure is averaged (days)

Each intake variable in the equation above consists of a range of values. The intake model variables used generally reflect 50th or 95th percentile values which ensure that the estimated intakes represent the RME when applied to the EPC. Formulas were derived from RAGS, Part A unless otherwise indicated.

8.4.3.1 Adult Worker Scenario

The adult worker is characterized as an individual who is onsite approximately one day per month for nine months of the year. His primary task is lawn mowing, which results in contact with surface soil. Table 8-22 presents the parameters used to calculate intakes of COPCs identified in the surface soil for the adult worker scenario. Tables 8-23 and 8-24 provide the equations and calculated ingestion and dermal contact pathway intakes for surface soil COPCs. Because groundwater is not used for irrigation and there are no seeps, springs, or process wells present, this receptor will not contact groundwater beneath Assembly F. Groundwater exposures will not be evaluated for this receptor.

8.4.3.2 Construction Worker Scenario

Currently, no construction activities are in process at Assembly F. Because future land use is unknown and many sites are inactive and vacant, it is reasonable to assume that future activities might require construction. As a result, a construction worker scenario will be evaluated. There is little formal guidance for construction activities. However, Region 4, TDEC, and the Navy selected exposure parameters for NSA Mid-South SWMU 5 (August, 1997 memo); these were used for the Assembly F HHRA.

For Assembly F, the construction worker is characterized as an individual on the site for approximately 120 days per year for an exposure duration of three years. To account for the high ingestion rate during a portion of the construction activities, a 200 milligram per day soil ingestion rate was used. Table 8-22 presents the exposure parameters used to estimate CDI. Tables 8-25

and 8-26 provide the ingestion and dermal pathway equations and calculated intakes for COPCs in soil.

Because of the depth to groundwater, the absence of seeps, springs, and process wells, it is unlikely that this receptor will contact groundwater underlying Assembly F. Therefore groundwater represents an incomplete exposure pathway and will not be quantitatively evaluated for this receptor.

8.4.3.3 Trespasser

The trespasser is characterized as an adolescent who gains access to the site to play, and is exposed to COPCs in the surface soil and sediment. Table 8-22 presents the exposure parameters used to estimate CDI. Tables 8-27 and 8-28 show the equations and calculated ingestion and dermal contact pathway intakes for surface soil.

There are no seeps, springs, or *process* wells on Assembly F land where the trespasser might contact groundwater. As a result, groundwater exposure is an incomplete pathway and will not be evaluated in this HHRA.

8.4.3.4 Hypothetical Future Site Resident

There are no current residents and future land use is unknown. Because of this uncertainty, a residential land use scenario was evaluated. Residential receptors are based on the default residential scenario provided in RAGS Part A (USEPA, 1989). Residential receptors are assumed to contact COPCs in both soil and groundwater. Table 8-22 shows the exposure parameters used to calculate CDI for COPCs surface soil and groundwater COPCs. Tables 8-29 through 8-32 provide the equation and calculated ingestion and dermal contact pathway intakes for surface soil COPCs. Tables 8-33 through 8-37 provide the equations and calculated ingestion and dermal contact pathway intakes for groundwater COPCs.

All intakes (or intake multipliers) are summarized in Table 8-38.

8.5 Toxicity Assessment

The objectives of the toxicity assessment are to (1) evaluate available information regarding the potential for COPCs to adversely affect exposed populations, and (2) provide the analytical framework to characterize human health impacts.

Pertinent toxicological data for COPCs were taken from the following sources, in descending order:

- *Integrated Risk Information System (IRIS) (USEPA, 1999)*
- *Health Effects Assessment Summary Tables (HEAST) (USEPA, 1997)*
- USEPA Criteria Documents
- *Toxicological Profiles* developed by the Agency for Toxic Substances and Disease Registry (ATSDR), U.S. Public Health Service.

Dermal reference dose (RfD) values and slope factors (SFs) are derived from the corresponding oral values. In deriving a dermal RfD, the oral RfD is multiplied by an oral absorption factor, which is expressed as a decimal fraction. The resulting dermal RfD is based on the absorbed dose, the appropriate value to which a dermal dose should be compared, because dermal doses are expressed as absorbed rather than administered (intake) doses. For the same reasons, a dermal SF is derived by dividing the oral SF by the oral absorption factor. The oral SF is divided rather than multiplied because SFs are expressed as reciprocal doses.

According to Appendix A of RAGS, Part A, an assumption of 5% oral absorption efficiency would be relatively conservative in the absence of specific data. However, USEPA Region 4 suggests using an oral to dermal absorption factor of 80% for volatile organic compounds,

50% for semivolatile organic compounds, and 20% for inorganics (USEPA, 1995). These percentages (or associated fractions) were used in the HHRA and are reflected in the applicable risk/hazard results.

Tables 8-39A through 8-39D presents detailed toxicity information for Assembly F COPCs. Provided in this table are toxicity values (RfDs and SFs), weight of evidence classification, type of cancer, SF basis, study length, confidence level, critical effect, RfD basis, uncertainty factors, and sources.

8.6 Risk Characterization

In this step, information obtained from the exposure and toxicity assessments were integrated to characterize the potential risks posed by COPCs selected for evaluation.

8.6.1 Risk Characterization Methodology

The methodology used to characterize risk associated with exposure to individual COPC is briefly outlined in the following sections.

Carcinogenic Effects

Potential risks for carcinogenic effects are estimated by calculating excess lifetime CR as a result of exposure to carcinogens. CR calculation for an exposure pathway involves multiplying the chronic daily intake for each chemical by its upper-bound cancer SF, using Equation 8-4 (USEPA, 1989).

Equation 8-4:

$$CR = CDI \times SF$$

where:

CR = Cancer risk (unitless)
CDI = Chronic daily intake of chemicals (mg/kg-day)
SF = Slope factor $(mg/kg\text{-}day)^{-1}$

The above equation is valid only at low risk. If the calculated risk exceeds 0.01, then cancer risk was calculated using Equation 8-5 (USEPA, 1989).

Equation 8-5:

$$CR = 1 - \exp(-CDI \times SF)$$

where the definitions for CR, CDI, and SF are the same as for Equation 8-4.

Noncarcinogenic Effects

Potential risks for noncarcinogenic effects are typically estimated by calculating the hazard quotient (HQ, the ratio of the chronic daily intake to the reference dose) for each chemical of concern using Equation 8-6.

Equation 8-6:

$$HQ = \frac{CDI}{RfD}$$

where:

HQ	=	Hazard quotient (unitless)
CDI	=	Chronic daily intake of chemicals (mg/kg-day)
RfD	=	Reference dose (mg/kg-day)

Risk for Multiple Chemicals

The methodology used to characterize risk associated with exposures to multiple chemicals is summarized below:

- Organize exposure and toxicity assessment outputs by each population's duration and exposure route.
- Tabulate total upper-bound excess lifetime CR and HQs for each COPC.

- Quantify total carcinogenic and noncarcinogenic risks for each pathway by summing the risks estimated for each COPC.

- Obtain the total upper-bound excess lifetime CR for each pathway by summing the chemical-specific CRs. For known or suspected carcinogens, acceptable exposure levels are generally concentrations that represent an excess upper-bound lifetime cancer risk to an individual of between 1E-04 and 1E-06. For this HHRA, chemicals will be identified as chemicals of concern (COCs) if the individual risk is greater than 1E-06 or the cumulative risk is greater than 1E-04.

- Sum the HQs of all chemicals under consideration to obtain the HI. In general, an HI that is less than or equal to one is not likely to be associated with any adverse health risks, and is less likely to be of regulatory concern than hazard indices greater than one. For this risk assessment, HQs greater than 0.1 for individual chemicals or HIs greater than 1 will be identified as COCs. If the HI exceeds one, the sum of the HQs will be re-calculated by segregating the chemicals into subgroups based on the target organs affected and the mechanism of action. Separate HIs will be calculated for each target organ and mechanism of action of concern.

- Estimate overall risks that affect each population over the same time period by combining risks across pathways.

8.6.2 Adult Worker Risk Characterization

Surface soil was evaluated under an adult worker scenario assuming exposure to COPCs through the incidental ingestion and dermal contact pathways. Tables 8-40 and 8-41 present the computed carcinogenic risks and/or HIs associated with these exposure pathways.

8.6.2.1 SWMU 22 Surface Soil Pathways

Table 8-40 presents the compound carcinogenic risks and/or HIs associated with the soil ingestion and dermal contact pathways, respectively.

Risk Estimates

The incremental lifetime cancer risks (ILCRs) for arsenic and benzo(a)pyrene as BEQ in surface soil are 2E-07 (ingestion) and 4E-08 (dermal contact). The cumulative risk for the adult worker surface soil pathway is 2E-07.

Hazard Estimates

The HIs for arsenic and benzo(a)pyrene as BEQ in surface soil are 0.001 (ingestion) and 0.0005 (dermal contact). The HI for the adult worker surface soil pathway is 0.002.

8.6.2.2 SWMU 39 Surface Soil Pathways

Table 8-41 presents the compound carcinogenic risks and/or HIs associated with the soil ingestion and dermal contact pathways, respectively.

Risk Estimates

The ILCR for dieldrin in surface soil is 1E-08 for both the incidental ingestion and dermal contact, pathways. The cumulative risk for the adult worker surface soil pathway is 2E-08.

Hazard Estimates

The HIs for dieldrin in surface soil are 0.000046 (ingestion) and 0.000038 (dermal contact). The HI for the adult worker surface soil pathway is 0.000084.

8.6.2.3 COCs Identified

No COCs were identified for this scenario.

8.6.3 Construction Worker Risk Characterization

Surface soil was evaluated under a construction worker scenario assuming exposure to COPCs via ingestion and dermal contact. Tables 8-40 and 8-41 present the calculated CR and/or HIs associated with these pathways.

8.6.3.1 SWMU 22 Surface Soil Pathways

Table 8-40 presents the compound carcinogenic risks and/or HIs associated with the soil ingestion and dermal contact pathways, respectively.

Risk Estimates

The ILCRs for arsenic and benzo(a)pyrene as BEQ in surface soil are 1E-06 (ingestion) and 1E-07 (dermal contact). The cumulative risk for the construction worker surface soil pathways is 1E-06.

Hazard Estimates

The HIs for arsenic in surface soil are 0.07 (ingestion) and 0.007 (dermal contact). The HI for the construction worker surface soil pathway is 0.08.

8.6.3.2 SWMU 39 Surface Soil Pathways

Table 8-41 presents the compound carcinogenic risks and/or HIs associated with the soil ingestion and dermal contact pathways, respectively.

Risk Estimates

The ILCR for dieldrin in surface soil is 8E-08 and 3E-08 for the ingestion and dermal contact pathway, respectively. The cumulative risk for the construction worker surface soil pathways is 1E-07.

Hazard Estimates

The HIs for dieldrin in surface soil is 0.002 and 0.001 for the ingestion and dermal contact pathways, respectively. The HI for the construction worker surface soil pathway is 0.003.

8.6.3.3 COCs Identified

No COCs were identified for this scenario.

8.6.4 Trespasser Risk Characterization

Surface soil and sediment were evaluated under a trespasser scenario. Exposure pathways for both surface soil and sediment include incidental ingestion and dermal contact. Tables 8-40 and 8-41 present the calculated CR and HIs associated with these pathways at SWMUs 22 and 39.

8.6.4.1 SWMU 22 Surface Soil Pathways

Table 8-40 presents the computed carcinogenic risks and/or HIs associated with the incidental ingestion and dermal contact pathways, respectively.

Risk Estimates

The ILCRs for arsenic and benzo(a)pyrene as BEQ in surface soil are 2E-06 (ingestion) and 4E-07 (dermal contact). The cumulative risk for the trespasser surface soil pathway is 2E-06.

Hazard Estimates

The HIs for arsenic and benzo(a)pyrene in surface soil are 0.02 (ingestion) and 0.005 (dermal contact). The HI for the adolescent trespasser surface soil pathway is 0.005.

8.6.4.2 SWMU 39 Surface Soil Pathways

Table 8-41 presents the computed carcinogenic risks and/or HIs associated with the incidental ingestion and dermal contact pathways, respectively.

Risk Estimates

The ILCRs for dieldrin in surface soil are 9E-08 (ingestion) and 8E-08 (dermal contact). The cumulative risk for the trespasser surface soil pathway is 2E-07.

Hazard Estimates

The HIs for surface soils were calculated to be 0.0008 (ingestion) and 0.0007 (dermal contact). The HI for the adolescent trespasser surface soil pathway is 0.001.

8.6.4.3 COCs Identified

Arsenic (SWMU 22) was identified as a COC for the trespasser scenario.

8.6.5 Hypothetical Future Site Resident Risk Characterization

Surface soil and groundwater were evaluated under a hypothetical future site resident scenario assuming COPC exposure via incidental ingestion and dermal contact inhalation pathways. Tables 8-40 and 8-41 present the computed carcinogenic risks and/or HIs associated with surface soil exposures. Tables 8-42 through 8-44 shows the calculated carcinogenic risks and/or HIs associated with groundwater exposures.

8.6.5.1 SWMU 22 Surface Soil Pathways

Table 8-40 presents the compound carcinogenic risks and/or HIs associated with the soil ingestion and dermal contact pathways, respectively.

Risk Estimates — Lifetime Weighted Average

The ILCRs for arsenic and benzo(a)pyrene as BEQ in surface soil are 5E-05 (ingestion) and 9E-06 (dermal contact). The cumulative risk for the hypothetical future site resident surface soil pathway is 6E-05.

Hazard Estimates — Child Resident

The HIs for arsenic in surface soil are 0.95 (ingestion) and 0.07 (dermal contact). The HI for the child resident surface soil pathway was calculated to be 1.

8.6.5.2 SWMU 39 Surface Soil Pathways

Table 8-41 presents the compound carcinogenic risks and/or HIs associated with the soil ingestion and dermal contact pathways, respectively.

Risk Estimates — Lifetime Weighted Average

The ILCRs for dieldrin in surface soil are 3E-06 (ingestion) and 1E-06 (dermal contact). The cumulative risk for the hypothetical future site resident surface soil pathway is 5E-06.

Hazard Estimates — Child Resident

The HIs for dieldrin in surface soil are 0.03 (ingestion) and 0.01 (dermal contact). The HI for the child resident surface soil pathway was calculated to be 0.04.

8.6.5.3 SWMU 17 Groundwater Pathways

Table 8-42 presents the compound carcinogenic risks and/or HIs associated with the groundwater ingestion and dermal contact with water pathways, respectively.

Risk Estimates — Lifetime Weighted Average

The ILCRs for COPCs in groundwater are 3E-05 (ingestion) and 2E-06 (dermal contact). 1,2-Dichloropropane is the primary contributor to risk. The cumulative risk for the hypothetical future site resident groundwater pathway is 3E-05.

Hazard Estimates — Child Resident

The HIs for groundwater are 0.02 (ingestion) and 1 (dermal contact). Benzene is the only contributor to hazard. The HI for the child resident groundwater pathway is 1.

8.6.5.4 SWMU 20 Groundwater Pathways

Table 8-43 presents the compound carcinogenic risks and/or HIs associated with the groundwater ingestion and dermal contact with groundwater pathways, respectively.

Risk Estimates — Lifetime Weighted Average

The ILCRs for COPCs in groundwater are 6E-04 (ingestion) and 6E-05 (dermal contact). 1,1-Dichloroethene and 1,1,2-trichloroethane are the primary contributor to risk. The cumulative risk for the hypothetical future site resident groundwater pathway is 7E-04.

Hazard Estimates — Child Resident

The HIs for groundwater are 1 (ingestion) and 47 (dermal contact). 1,1-Dichloroethane, 1,1-dichloroethene, benzene, and 2-butanone are the primary contributors to hazard. The HI for the child resident groundwater pathway is 48.

8.6.5.5 SWMU 39 Groundwater Pathways

Table 8-44 presents the compound carcinogenic risks and/or HIs associated with the groudnwater ingestion and dermal contact with groundwater pathways, respectively.

Risk Estimates — Lifetime Weighted Average

The ILCRs for COPCs in groundwater are 3E-05 (ingestion) and 2E-05 (dermal contact). Trichloroethene is the only contributor to risk. The cumulative risk for the hypothetical future site resident groundwater pathway is 5E-05.

Hazard Estimates — Child Resident

The HIs for groundwater are 2 (ingestion) and 136 (dermal contact). Trichloroethene and 1,2-dichloroethene (total) are the primary contributors to hazard. The HI for the child resident groundwater pathway is 138.

8.6.5.6 COCs Identified

COCs identified for the hypothetical future site resident scenario. As shown, dieldrin was identified as surface soil COCs for the hypothetical future site resident scenario based on its contribution to risk for SWMU 39. For SWMU 39, trichloroethene and 1,2-dichloroethene (total) were identified as groundwater COCs based on their contribution to hazard. Trichloroethene in groundwater also exhibited risk above acceptable risk levels.

For SWMU 17, 1,2-dichloropropane in groundwater was identified as a COC based on its contribution to risk. Benzene was also identified as a COC for SWMU 17 based on its contribution to hazard.

For SWMU 20, 1,1-dichloroethene and 1,1,2-trichloroethane in groundwater were identified as COCs based on their contribution to risk. 1,1-Dichloroethane, 1,1-dichloroethene, benzene, and 2-butanone in groundwater were identified as COCs based on their contribution to hazard.

For SWMU 22 surface soil, arsenic and benzo(a)pyrene as BEQ were identified as COCs based on their contribution to risk. Arsenic was also selected as a COC based on it contribution to hazard.

8.6.6 Risk Characterization Summary

Identification of COCs was based on the cumulative (all pathway) risk and hazard for each chemical. USEPA has established an acceptable risk range of 1E-06 to 1E-04, and a hazard threshold of 1. RAGS (*Supplemental Guidance to RAGS: Region 4 Bulletin, Section 5*) defines a COC as a chemical that meets the criteria presented here:

- It contributes to a cumulative risk level of 1E-04 or greater based on a specific exposure pathway such as soil.
- Its individual ILCR exceeds 1E-06.
- Its cumulative hazard exceeds 1.
- Its individual HQ exceeds 0.1.

Based on these criteria, the COCs identified for each Assembly F receptor are presented below.

	SWMU 17 Groundwater	SWMU 20 Groundwater	SWMU 22 Soil	SWMU 39 Soil	SWMU 39 Groundwater
Trespasser	none	none	arsenic	none	none
Resident (Child)	benzene	1,1-dichloroethane 1,2-dichloroethane 1,1-dichloroethene acetone benzene 2-butanone 1,1,2-trichloroethane	arsenic BEQ	none	acetone 1,2-dichloroethene (total) trichloroethene
LWA Exposure	1,2 -dichloropropane	1,1-dichloroethene 1,1,2-trichloroethane 1,2-dichloroethane benzene	arsenic BEQ	dieldrin	trichloroethene

8.7 Risk Uncertainty Discussion

Uncertainties in the exposure assessment could arise from the following sources:

- Use of standard assumptions instead of site-specific data selected on the basis of "best professional judgment."

- Selection of a value from a wide range reported in published literature thought to best represent the site under study.

- The degree of "protectiveness" or "conservatism" inherent in the current risk assessment guidance.

- Lack of sufficient data and necessary assumptions made to complete the quantitative risk assessment.

The types and sources of exposure uncertainties are outlined below.

8.7.1 Exposure Settings, Pathways, and Land Use Assumptions

This risk evaluation considers adult worker, trespasser, construction worker, and residential exposure at Assembly F for those chemicals detected at the site and the media for which data are available. Although not considered likely in the actual environmental situation, it was assumed that the population of concern could simultaneously be exposed to multiple chemicals through all possible pathways. This conservative assumption is anticipated to overestimate potential site risks.

Trespassing Exposure Frequency

Future land use at this site has not been designated and it is unknown if trespassers can gain access to it. Therefore, there is considerable uncertainty associated with the exposure frequency used for this assessment, which uses an exposure frequency of 52 days per year for a 10-year period, even though some members of the population could experience greater exposure. Although site-specific

information is unknown, it is not anticipated that risk and hazard associated with this exposure pathway were underestimated.

Construction Worker Exposure

The construction worker scenario was modeled using USEPA Region 4, TDEC, and Navy guidance, and some discussion is warranted to put the assumptions in perspective for risk managers. The construction worker scenario exposure frequency and duration used in this evaluation should be considered both speculative and conservative because future site use has not been designated. Construction work would clearly change current soil conditions. The length of time needed to complete construction projects varies depending upon the structure erected. However, it is certain that typical exposures are not long-term or chronic exposures. Toxicological data used in risk evaluations are for chronic exposure conditions, which could be more conservative than subchronic and acute endpoints, sometimes by more than an order of magnitude. Consequently, applying chronic data to a subchronic or acute scenario could overestimate risk.

Based on uncertainties associated with toxicity values, exposure frequency and duration, and soil ingestion rate, the actual risk associated with this receptor is uncertain. However, in choosing overly conservative exposure parameters to estimate daily intake, risk was most likely overestimated.

Exposure Parameter Values

Soil Ingestion Rate

In accordance with USEPA guidance (USEPA, 1991), the following combined soil and dust ingestion rates were used in the HHRA: 200 mg/day (for children aged 1 to 6), 100 mg/day (for trespassing children and adults), 200 mg/workday (for construction workers), and 50 mg/day (for adult workers).

An evaluation of published literature on child ingestion rates indicated that the 50th and 95th percentile of the distribution are 16 mg/day and 110 mg/day, respectively. Therefore, the USEPA default soil ingestion rate of 200 mg/day is overly conservative and not supported by existing data.

USEPA does not provide default soil ingestion values for a trespassing scenario. In the absence of this information, soil ingestion was estimated to be 100 mg/day.

There are no reliable data for estimating adult soil ingestion rates. The USEPA standard default soil ingestion rate of 100 mg/day is primarily based on a soil ingestion rate of 65 mg/day as reported in a study by Hawley (1985). It should be noted that information reported in this study was derived based on the author's assumptions regarding activity patterns and intake rates of soil and house dust. Therefore, there are uncertainties associated with the validity of data reported in this study.

A soil ingestion rate of 50 mg/day for adults in commercial/industrial setting is recommended as a standard default value (USEPA,1991). This default value is based on a preliminary adult soil ingestion study by Calabrese (1991). However, Calabrese and Stanek have since determined that the soil ingestion rates reported in their preliminary study were invalid and that the previously derived ingestion rate of 50 mg/day is an overestimation (Calabrese and Stanek, 1991).

In summary, the soil ingestion rates currently recommended by USEPA are overly conservative and not supported by the scientific literature. Therefore, use of these default soil ingestion rates in this risk assessment is expected to result in an overestimation of risk.

Soil-to-Skin Adherence Factor (AF)

Because of the lack of site-specific information available regarding exposure for the Assembly F receptors evaluated, a default AF value of 1 mg/cm^2 was used to estimate intake of chemicals in soil via the dermal exposure route (USEPA, 1995). Available studies indicate that adherence levels vary considerably with the type of activities and across different parts of the body (USEPA, 1997). Applying this information to evaluated receptors indicates that construction workers would most likely have the greatest potential of receiving the highest dermal load from soil. Therefore, use of an AF of 1 mg/cm^2 is probably accurate. However, for the remaining scenarios, the dermal load would be considerably less resulting in overestimation of dermal risk and hazard.

Absorption Factor (ABS)

Very limited information is available concerning dermal absorption of chemicals from contaminated soil under realistic environmental conditions. In fact, there are no actual epidemiological data to support the current USEPA position that absorption of soil-bound organics under realistic exposure conditions constitutes a complete pathway.

USEPA Region 4 (USEPA, 1995a) requires that ABS values be based on the following default values: organics; 1%, inorganics; 0.1%. It should be emphasized that information to support chemical-specific ABS is only available for the following chemicals: cadmium (1%), poylchlorinated biphenyls (6%), TCDD (3% for low organic soil and 0.1% for high organic soil), and other dioxins (3%) (USEPA, 1992a). According to the recently released *Soil Screening Guidance* (USEPA, 1996c), pentachlorophenol is the only chemical among the 110 evaluated with more than 10% dermal absorption. Therefore, quantification of dermal pathways has been deferred in several USEPA documents (USEPA, 1992a, 1996b) pending development of adequate data and methodology.

The ABS values recommended by Region 4 were considered to be comparable to the values presented most recently in the literature. The ABS database for chemicals encountered as media contaminants is limited; therefore, the use of these default values could overestimate or underestimate risk associated with dermal exposure.

8.7.2 Exposure Point Concentration

A conservative approach was used to estimate the concentrations at the exposure point, not considering degradation of any chemicals in the environmental media. Because it has been well recognized that many organic chemicals can undergo degradation processes in the environment, this conservative approach is expected to result in an overestimate of risk.

The data sets used for Assembly F are generally small, but when appropriate, UCLs were calculated. Data sets often contain many assumed values. A few high detections and many nondetected values would increase the standard deviation, ultimately increasing the UCL above the maximum reported concentration. Conversely, a few concentrations reported near or slightly below the standard quantitation limit and many nondetected values could lower the UCL. To minimize this uncertainty, when data sets had fewer than 10 total samples for a specific medium, the maximum concentrations detected were used as the EPC. This approach is consistent with current USEPA guidance (USEPA, 1992).

Uncertainty is associated with EPCs also stems from using maximum concentrations for the groundwater EPC. Maximum concentrations were used because of the high percentage of nondetects or the relatively small size of the data sets. USEPA does not recommend using maximum concentrations to estimate exposure because exposure to the maximum concentration of every chemical detected across the site overestimates exposure (a theoretical hot spot having the maximum concentrations detected in all samples collected).

8.7.3 Data Uncertainty

Uncertainties in the data set influence the chemicals evaluated in the HHRA and the magnitude of risk and hazard estimated for those chemicals. In general, data uncertainties were associated with the type of data used, the sample number per medium for each SWMU, and chemicals detected in site samples. These uncertainties are briefly outlined below.

Data Type

Because data sets were typically small (less than 20 samples) direct push technology (DPT) sample data were used in this HHRA. DPT data is generally not used for defining risk because the samples collected are highly turbid. Therefore, the chemicals detected may actually be adsorbed onto suspended organic matter rather than dissolved in water. Risk and hazard estimated using this data is most likely overestimated.

Sample Size

With the exception of SWMU 39 groundwater, data sets had fewer than 10 samples and in many instances there was 1 to 2 detections of the compounds selected as COPCs. Because these SWMUs were associated with tank closures that are associated with small source areas and known release points, the number of samples collected were adequate to define nature and extent of contamination of this type of site.

An additional problem is that for some areas there are only 1 to 2 samples and the detected chemical concentrations were less than the RBCs and when applicable the reference concentration. Because areas that have higher concentrations or are hot spots could have been missed during sampling, it is possible that the risk and hazard estimated are inaccurate.

Detected Chemicals

There is an inherent uncertainty in the analytical process. Chemicals can be adequately identified but the concentration of the chemical is an estimate. Analytical methods can easily identify chemicals but these methods do not distinguish between chemicals associated with site contamination and those introduced during sampling and analysis. For SWMUs 20 and 39, both acetone and 2-butanone were selected as COPCs. These compounds are known to be associated with laboratory contamination rather than site contamination. In addition, acetone is also associated with isopropyl alcohol used during field equipment decontamination (EnSafe, 1999). Because it is questionable that these compounds represent site contamination, risk and hazard estimated for these compounds are inaccurate.

8.7.4 Toxicological Uncertainty

There is a generally recognized uncertainty in human toxicological risk values developed from experimental data primarily because of the uncertainty of data extrapolation in the areas of (1) high- to low-dose exposure and (2) animal data to human exposure. The uncertainty factors assigned to these values account for acute to chronic dose extrapolation, study inadequacies, and sensitive subpopulations, among other factors. Although uncertainty factors for a specific compound may be 1,000 or higher, these safety factors are applied by USEPA to help guarantee that the overall assessment of risk/hazard is conservative relative to human health concerns. In the presence of such uncertainty, the USEPA and the risk assessor are obligated to make conservative assumptions so that the chance is very small for the actual health risk to be greater than what is determined through the risk assessment process.

8.8 Derivation of Remedial Goal Options

Remedial Goal Options (RGOs) were derived for exposure routes exceeding levels that are typically used by regulatory agencies as the point of departure for considering corrective actions using the approach outlined below.

8.8.1 Methodology

RGOs are chemical concentrations computed to equate with specific risk and/or hazard goals that may be established for a particular site. As previously discussed, COCs are identified as any COPC that significantly contributes to a pathway of concern. A pathway having an ILCR greater than 1E-06 or an HI greater than 1 is defined as a pathway of concern, and an individual chemical which contributes either 1E-06 ILCR or 0.1 HQ is considered to significantly contribute to the pathway ILCR or HI. Based on this method, COCs were identified which required calculating RGOs; they are listed in the risk characterization section of the HHRA for each site. RGOs were calculated for all COCs contributing to a pathway risk of 1E-06 or greater. Inclusion in the RGO table does not necessarily indicate that remedial action will be required to address a specific chemical. Instead, RGOs are provided to facilitate risk management decisions.

In accordance with USEPA Supplemental RGO Guidance, RGOs were calculated at 1E-04, 1E-05, and 1E-06 risk levels for carcinogenic COCs and HQ goals of 3, 1, and 0.1 for noncarcinogenic COCs. RGOs for carcinogens were based on the lifetime-weighted average for the site resident and the adult worker. Separate RGOs were calculated for each receptor group that had identified COCs. Calculations of hazard-based RGOs for the hypothetical future site resident were based on the child resident.

Tables 8-45A and 8-45B present the RGOs for the site resident exposed to soil and groundwater and the trespasser exposed to surface soil. Because no COCs were identified for the construction worker and adult worker, RGOs were not calculated for these scenarios.

8.9 Conclusions and Recommendations

COCs identified for Assembly F are restricted to SWMU 22 and 39 soil and SWMU 17, 20, and 39 groundwater. With the exception of surface soil trespasser exposures at SWMU 22, all COCs were selected based on the residential groundwater use. Currently neither loess nor fluvial

deposits groundwater at Assembly F is used for potable or as general use water. Additionally, there are no known residential receptors for this parcel of land. If land use conditions are changed to residential and groundwater beneath the site is used as potable water, it is unlikely that COCs identified for Assembly present unacceptable human health risks. If these conditions were to occur then additional groundwater data for SWMUs 17 and 20 should be collected to adequately define the extent of VOC contamination.

Table 8-1
Chemicals Present in SWMU 17 Surface Soil Samples
Assembly F
NSA Mid-South, Millington, Tennessee

Chemical	Units	Detection Frequency	Range of Nondetects	Range of Detected Concentrations	Average Detected Concentration	Region 3 RBC	RC[a]	Selected as COPC
Antimony	mg/kg	1 / 1	NA	9 – 9	9	3.1	ND	Yes
Arsenic	mg/kg	1 / 1	NA	2.5 – 2.5	2.5	0.43	14.58	No[b]
Barium	mg/kg	1 / 1	NA	108 – 108	108	548	223.46	No
Beryllium	mg/kg	1 / 1	NA	0.45 – 0.45	0.45	15.6	1	No
Cadmium	mg/kg	1 / 1	NA	2.8 – 2.8	2.8	7.8	1.54	No
Chromium	mg/kg	1 / 1	NA	10.9 – 10.9	10.9	23.5	23.89	No
Cobalt	mg/kg	1 / 1	NA	8.0 – 8.0	8.0	469	15.98	No
Copper	mg/kg	1 / 1	NA	19.5 – 19.5	19.5	313	24.19	No
Lead[c]	mg/kg	1 / 1	NA	14.4 – 14.4	14.4	400	26.03	No
Nickel	mg/kg	1 / 1	NA	18.8 – 18.8	18.8	156	20.62	No
Tin	mg/kg	1 / 1	NA	25.4 – 25.4	25.4	4,693	33.56	No
Vanadium	mg/kg	1 / 1	NA	21.6 – 21.6	21.6	54.8	45.11	No
Zinc	mg/kg	1 / 1	NA	55.7 – 55.7	55.7	2,346	98	No
4,4'-DDD	µg/kg	1 / 1	NA	3.8 – 3.8	3.8	2,661	NA	No
4,4'-DDE	µg/kg	1 / 1	NA	4.8 – 4.8	4.8	1,879	NA	No
4,4'-DDT	µg/kg	1 / 1	NA	2.4 – 2.4	2.4	1,879	NA	No
alpha-Chlordane	µg/kg	1 / 1	NA	2.6 – 2.6	2.6	1,825	NA	No
Endosulfan II	µg/kg	1 / 1	NA	4.4 – 4.4	4.4	46,929	NA	No
Endrin	µg/kg	1 / 1	NA	5.6 – 5.6	5.6	2,346	NA	No
Endrin aldehyde	µg/kg	1 / 1	NA	2.3 – 2.3	2.3	2,346	NA	No
Heptachlor epoxide	µg/kg	1 / 1	NA	2.3 – 2.3	2.3	70.2	NA	No
2-Methylnaphthalene	µg/kg	1 / 1	NA	15000 – 15000	15000	156,429	NA	No
Naphthalene	µg/kg	1 / 1	NA	8700 – 8700	8700	156,429	NA	No
Phenanthrene	µg/kg	1 / 1	NA	1100 – 1100	1100	234,643	NA	No
Ethylbenzene	µg/kg	1 / 1	NA	370 – 370	370	782,143	NA	No
Styrene	µg/kg	1 / 1	NA	31 – 31	31	1,564,286	NA	No
Tetrachloroethene	µg/kg	1 / 1	NA	17 – 17	17	12,283	NA	No
Toluene	µg/kg	1 / 1	NA	140 – 140	140	1,564,286	NA	No
Xylene (Total)	µg/kg	1 / 1	NA	1400 – 1400	1400	15,642,857	NA	No

Notes:

RBC = Screening toxicity values are the residential soil concentrations presented in the Region 3 Risk Based Concentration Table, (USEPA, October 1999). Screening values for noncarcinogens have been adjusted from the target hazard quotient of 1 to 0.1.
COPC = chemical of potential concern
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
ND = Analyte was not detected in background soils.
NA = not applicable

a = Reference concentration was calculated using 2× the mean background concentration as recommended by USEPA Region 4 in *Supplemental Guidance to RAGs: Region 4 Bulletin No. 1* (USEPA, 1995).
b = Maximum detected concentration exceeds Region 3 RBC but does not exceed site reference concentration; therefore, parameter is not a COPC.
c = The lead screening value of 400 mg/kg was used as recommended by USEPA (USEPA, 1994).

Surrogates:

Chlordane used as a surrogate for alpha-chlordane.
Endosulfan was used as a surrogate for Endosulfan II.
Pyrene was used as a surrogate for phenanthrene.

Table 8-2
Chemicals Present in SWMU 19 Surface Soil Samples
Assembly F
NSA Mid-South, Millington, Tennessee

Chemical	Units	Detection Frequency	Range of Nondetects	Range of Detected Concentrations	Average Detected Concentration	Region 3 RBC	RC[a]	Selected as COPC
Arsenic	mg/kg	2 / 2	NA	5.5 – 6.2	5.85	0.426	14.58	No[b]
Barium	mg/kg	2 / 2	NA	141 – 172	156.5	548	223.46	No
Beryllium	mg/kg	2 / 2	NA	0.44 – 0.53	0.485	15.64	1	No
Cadmium	mg/kg	2 / 2	NA	0.86 – 0.88	0.87	7.82	1.54	No
Chromium	mg/kg	2 / 2	NA	9.2 – 12.6	10.9	23.46	23.89	No
Cobalt	mg/kg	2 / 2	NA	8.0 – 8.6	8.3	469	15.98	No
Copper	mg/kg	2 / 2	NA	10.6 – 14.4	12.5	313	24.19	No
Lead[d]	mg/kg	2 / 2	NA	75.3 – 96.6	85.95	400	26.03	No[c]
Nickel	mg/kg	2 / 2	NA	15.6 – 19.9	17.75	156	0.46	No
Selenium	mg/kg	1 / 2	0.25 – 0.25	0.37 – 0.37	0.37	39.11	ND	No
Tin	mg/kg	2 / 2	NA	21.3 – 37.6	29.45	4,693	33.56	No
Vanadium	mg/kg	2 / 2	NA	17.0 – 20.8	18.9	54.75	45.11	No
Zinc	mg/kg	2 / 2	NA	83.6 – 166	124.8	2,346	98	No
4,4'-DDE	µg/kg	1 / 2	4.4 – 4.4	5.6 – 5.6	5.6	1,879	NA	No
4,4'-DDT	µg/kg	1 / 2	4.2 – 4.2	4.8 – 4.8	4.8	1,879	NA	No
Endosulfan II	µg/kg	2 / 2	NA	4.0 – 7.7	5.85	46,929	NA	No
Heptachlor	µg/kg	1 / 2	2.1 – 2.1	2.8 – 2.8	2.8	141.9	NA	No
Heptachlor epoxide	µg/kg	1 / 2	2.1 – 2.1	1.9 – 1.9	1.9	70.19	NA	No
2-Methylnaphthalene	µg/kg	2 / 2	NA	7600 – 9400	8500	156,429	NA	No
Naphthalene	µg/kg	2 / 2	NA	3600 – 4400	4000	156,429	NA	No
bis(2-Ethylhexyl)phthalate (BEHP)	µg/kg	2 / 2	NA	1600 – 1800	1700	45,623	NA	No
2-Butanone (MEK)	µg/kg	1 / 2	1600 – 1600	56 – 56	56	4,692,857	NA	No
4-Methyl-2-Pentanone (MIBK)	µg/kg	1 / 2	1600 – 1600	20 – 20	20	625,714	NA	No
Acetone	µg/kg	1 / 2	1600 – 1600	330 – 330	330	782,143	NA	No
Benzene	µg/kg	2 / 2	NA	63 – 250	156.5	22,025	NA	No
Ethylbenzene	µg/kg	2 / 2	NA	280 – 1800	1040	782,143	NA	No
Styrene	µg/kg	1 / 2	1600 – 1600	15 – 15	15	1,564,286	NA	No
Toluene	µg/kg	2 / 2	NA	190 – 3000	1595	1,564,286	NA	No
Xylene (Total)	µg/kg	2 / 2	NA	1600 – 12000	6800	15,642,857	NA	No

Notes:

RBC = Screening toxicity values are the residential soil concentrations presented in the Region 3 Risk Based Concentration Table, (USEPA, October 1999). Screening values for noncarcinogens have been adjusted from the target hazard quotient of 1 to 0.1.
COPC = chemical of potential concern
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
ND = Analyte was not detected in background soils.
NA = not applicable

a = Reference concentration was calculated using 2× the mean background concentration as recommended by USEPA Region 4 in *Supplemental Guidance to RAGs: Region 4 Bulletin No. 1* (USEPA, 1995).
b = Maximum detected concentration exceeds Region 3 RBC but does not exceed site reference concentration; therefore, parameter is not a COPC.
c = The mean lead value was greater than the reference concentration but is not a COPC based on the interim soil lead guidance of 400 mg/kg

Table 8-3
Chemicals Present in SWMU 20 Surface Soil Samples
Assembly F
NSA Mid-South, Millington, Tennessee

Chemical	Units	Detection Frequency	Range of Nondetects	Range of Detected Concentrations	Average Detected Concentration	Region 3 RBC	RC[a]	Selected as COPC
Arsenic	mg/kg	2 / 2	NA	8.8 – 12	10.4	0.426	14.58	No[b]
Barium	mg/kg	2 / 2	NA	82.4 – 140	111.2	548	223.46	No
Beryllium	mg/kg	2 / 2	NA	0.38 – 0.47	0.425	15.6	1	No
Chromium	mg/kg	2 / 2	NA	10.8 – 11.4	11.1	23.5	1.54	No
Cobalt	mg/kg	2 / 2	NA	6.4 – 8.6	7.5	469	15.98	No
Copper	mg/kg	2 / 2	NA	14.2 – 15.1	14.65	313	24.19	No
Lead	mg/kg	2 / 2	NA	12.7 – 13.3	13	400	26.03	No
Mercury	mg/kg	2 / 2	NA	0.03 – 0.03	0.03	2.3	0.46	No
Nickel	mg/kg	2 / 2	NA	15.7 – 22.3	19	156	20.62	No
Selenium	mg/kg	2 / 2	NA	0.18 – 0.27	0.225	39	ND	No
Silver	mg/kg	1 / 2	0.56 – 0.56	2.1 – 2.1	2.1	39	2.05	No
Vanadium	mg/kg	2 / 2	NA	20.7 – 21.9	21.3	55	45.11	No
Zinc	mg/kg	2 / 2	NA	41.8 – 44.1	42.95	2,346.4	98	No
Aldrin	µg/kg	2 / 2	NA	1.1 – 4	2.55	38	NA	No
Dieldrin	µg/kg	1 / 2	4 – 4	3.9 – 3.9	3.9	40	NA	No
bis(2-Ethylhexyl)phthalate (BEHP)	µg/kg	1 / 2	400 – 400	780 – 780	780	45,623	NA	No
1,1-Dichloroethane	µg/kg	3 / 5	10 – 12	6 – 22	14	782,143	NA	No
1,1-Dichloroethene	µg/kg	4 / 5	12 – 12	8 – 77	33	1,065	NA	No
Acetone	µg/kg	2 / 5	100 – 100	41 – 120	80.5	782,143	NA	No
Methylene chloride	µg/kg	2 / 5	10 – 12	12 – 13	12.5	85,163	NA	No
Toluene	µg/kg	1 / 5	10 – 12	1 – 1	1	1,564,286	NA	No

Notes:

RBC = Screening toxicity values are the residential soil concentrations presented in the Region 3 Risk Based Concentration Table, (USEPA, October 1999). Screening values for noncarcinogens have been adjusted from the target hazard quotient of 1 to 0.1.
COPC = chemical of potential concern
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
ND = Analyte was not detected in background soils.
NA = not applicable

a = Reference concentration was calculated using 2× the mean background concentration as recommended by USEPA Region 4 in *Supplemental Guidance to RAGs: Region 4 Bulletin No. 1* (USEPA, 1995).
b = Maximum detected concentration exceeds Region 3 RBC but does not exceed site reference concentration; therefore, parameter is not a COPC.
c = The lead screening value of 400 mg/kg was used as recommended by USEPA (USEPA, 1994).

Surrogate:

Mercuric chloride was used as a surrogate for mercury.

Table 8-4
Chemicals Present in SWMU 22 Surface Soil Samples
Assembly F
NSA Mid-South, Millington, Tennessee

Chemical	Units	Detection Frequency	Range of Nondetects	Range of Detected Concentrations	Average Detected Concentration	Region 3 RBC	RC[a]	Selected as COPC
Arsenic	mg/kg	2 / 2	NA	12.5 – 22.2	17.35	0.43	14.58	Yes
Barium	mg/kg	2 / 2	NA	45.2 – 51.9	48.55	548	223.46	No
Beryllium	mg/kg	2 / 2	NA	0.34 – 0.36	0.35	15.6	1	No
Chromium	mg/kg	2 / 2	NA	12.3 – 13.8	13.05	23.5	23.89	No
Cobalt	mg/kg	2 / 2	NA	4.9 – 6.7	5.8	469	15.98	No
Copper	mg/kg	2 / 2	NA	11.2 – 12.5	11.85	313	24.19	No
Lead[b]	mg/kg	2 / 2	NA	12.4 – 35.1	23.75	400	26.03	No
Mercury	mg/kg	2 / 2	NA	0.04 – 0.04	0.04	2.3	0.46	No
Nickel	mg/kg	2 / 2	NA	8.9 – 12.1	10.5	156	20.62	No
Selenium	mg/kg	1 / 2	0.35 – 0.35	0.51 – 0.51	0.51	39	ND	No
Thallium	mg/kg	1 / 2	0.24 – 0.24	0.33 – 0.33	0.33	0.548	ND	No
Vanadium	mg/kg	2 / 2	NA	25.4 – 26.7	26.05	54.8	45.11	No
Zinc	mg/kg	2 / 2	NA	35.3 – 37.6	36.45	2,346	98	No
2,4,5-TP (Silvex)	µg/kg	1 / 2	0.95 – 0.95	1.9 – 1.9	1.9	62,571	NA	No
2-Methylnaphthalene	µg/kg	1 / 2	410 – 410	360 – 360	360	156,429	NA	No
Acenaphthylene	µg/kg	1 / 2	420 – 420	110 – 110	110	469,286	NA	No
Anthracene	µg/kg	1 / 2	420 – 420	77 – 77	77	2,346,429	NA	No
Benzo(a)anthracene	µg/kg	1 / 2	420 – 420	140 – 140	140	875	NA	No
Benzo(a)pyrene	µg/kg	2 / 2	NA	58 – 320	189	87	NA	Yes
Benzo(b)fluoranthene	µg/kg	2 / 2	NA	77 – 400	238.5	875	NA	No
Benzo(g,h,i)perylene	µg/kg	2 / 2	NA	40 – 61	50.5	234,643	NA	No
Benzo(k)fluoranthene	µg/kg	2 / 2	NA	60 – 330	195	8,750	NA	No
Chrysene	µg/kg	2 / 2	NA	53 – 240	146.5	87,497	NA	No
Dibenz(a,h)anthracene	µg/kg	1 / 2	420 – 420	110 – 110	110	87	NA	Yes
Fluoranthene	µg/kg	2 / 2	NA	75 – 140	107.5	312,857	NA	No
Indeno(1,2,3-cd)pyrene	µg/kg	2 / 2	NA	48 – 290	169	875	NA	No
Naphthalene	µg/kg	1 / 2	410 – 410	280 – 280	280	156,429	NA	No
Pyrene	µg/kg	2 / 2	NA	65 – 240	152.5	234,643	NA	No
bis(2-Ethylhexyl)phthalate (BEHP)	µg/kg	1 / 2	420 – 420	74 – 74	74	45,623	NA	No
1,1,2-Trichloroethane	µg/kg	1 / 7	10 – 12	21 – 21	21	11,206	NA	No
2-Butanone (MEK)	µg/kg	1 / 7	12 – 50	150 – 150	150	4,692,857	NA	No
Acetone	µg/kg	3 / 7	100 – 100	31 – 400	169	7,821,429	NA	No
Ethylbenzene	µg/kg	1 / 7	10 – 12	81 – 81	81	782,143	NA	No
Methylene chloride	µg/kg	1 / 7	10 – 30	650 – 650	650	85,163	NA	No
m-Xylene	µg/kg	1 / 5	20 – 20	63 – 63	63	15,642,857	NA	No

Notes:

RBC = Screening toxicity values are the residential soil concentrations presented in the Region 3 Risk Based Concentration Table, (USEPA, October 1999). Screening values for noncarcinogens have been adjusted from the target hazard quotient of 1 to 0.1.
COPC = chemical of potential concern
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
ND = Analyte was not detected in background soils.
NA = not applicable

a = Reference concentration was calculated using 2× the mean background concentration as recommended by USEPA Region 4 in *Supplemental Guidance to RAGs: Region 4 Bulletin No. 1* (USEPA, 1995).
b = The lead screening value of 400 mg/kg was used as recommended by USEPA (USEPA, 1994).

Surrogates:

Mercuric chloride was used as a surrogate for mercury.
Acenaphthene was used as a surrogate for acenaphthylene
Pyrene was used as a surrogate for benzo(g,h,i)perylene.

Table 8-5
Chemicals Present in SWMU 39 Surface Soil Samples
Assembly F
NSA Mid-South, Millington, Tennessee

Chemical	Units	Detection Frequency	Range of Nondetects	Range of Detected Concentrations	Average Detected Concentration	Region 3 RBC	RC[a]	Selected as COPC
Arsenic	mg/kg	2 / 2	NA	2.9 – 5.4	4.15	0.426	14.58	No[b]
Barium	mg/kg	2 / 2	NA	68.4 – 157	112.7	548	223.46	No
Cadmium	mg/kg	1 / 2	0.48 – 0.48	1.0 – 1.0	1.0	7.8	1.54	No
Chromium	mg/kg	2 / 2	NA	8.5 – 10.3	9.4	23.5	23.89	No
Cobalt	mg/kg	2 / 2	NA	5.0 – 11.6	8.3	469	15.98	No
Copper	mg/kg	2 / 2	NA	12.4 – 16.2	14.3	313	24.19	No
Lead[c]	mg/kg	2 / 2	NA	44 – 155	99.5	400	26.03	No
Mercury	mg/kg	2 / 2	NA	0.07 – 0.08	0.075	2.3	0.46	No
Nickel	mg/kg	2 / 2	NA	14.3 – 16.4	15.35	156	20.62	No
Vanadium	mg/kg	2 / 2	NA	15.4 – 22.8	19.1	54.8	45.11	No
Zinc	mg/kg	2 / 2	NA	60.3 – 172	116.2	2,346.4	98	No
Aroclor-1260	µg/kg	1 / 5	39 – 41	43 – 43	43	319	NA	No
4,4'-DDD	µg/kg	1 / 2	4.4 – 4.4	88 – 88	88	2,661	NA	No
4,4'-DDE	µg/kg	2 / 2	NA	5.6 – 260	132.80	1,879	NA	No
4,4'-DDT	µg/kg	2 / 2	NA	18 – 380	199	1,879	NA	No
Dieldrin	µg/kg	1 / 2	4 – 4	130 – 130	130	39.9	NA	Yes
Endosulfan I	µg/kg	1 / 2	2.2 – 2.2	15 – 15	15	46,929	NA	No
Endrin ketone	µg/kg	1 / 2	4 – 4	2.5 – 2.5	2.5	2,346	NA	No
Heptachlor	µg/kg	1 / 2	2 – 2	4.6 – 4.6	4.6	142	NA	No
Technical Chlordane	µg/kg	1 / 2	40 – 40	1200 – 1200	1200	1,825	NA	No
alpha-Chlordane	µg/kg	1 / 2	4 – 4	140 – 140	140	1,825	NA	No
gamma-Chlordane	µg/kg	2 / 2	NA	2.6 – 170	86.3	1,825	NA	No
2-Butanone (MEK)	µg/kg	1 / 11	12 – 50	26.5 – 26.5	26.5	4,692,857	NA	No
Ethylbenzene	µg/kg	1 / 11	6.2 – 12	530 – 530	530	782,143	NA	No
Methylene chloride	µg/kg	2 / 11	6 – 12	160 – 450	305	85,163	NA	No
Tetrachloroethene	µg/kg	1 / 11	6.2 – 12	95.5 – 95.5	95.5	12,283	NA	No
Toluene	µg/kg	1 / 11	6.2 – 12	15.5 – 15.5	15.5	1,564,286	NA	No
Trichloroethene	µg/kg	1 / 11	6.2 – 12	18 – 18	18.0	58,066	NA	No
Xylene (Total)	µg/kg	1 / 8	12 – 13	6250 – 6250	6250	15,642,857	NA	No
cis-1,2-Dichloroethene	µg/kg	1 / 5	6.2 – 6.4	14.5 – 14.5	14.5	78,214	NA	No

Notes:

RBC = Screening toxicity values are the residential soil concentrations presented in the Region 3 Risk Based Concentration Table, (USEPA, October 1999). Screening values for noncarcinogens have been adjusted from the target hazard quotient of 1 to 0.1.
COPC = chemical of potential concern
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
ND = Analyte was not detected in background soils.
NA = not applicable

a = Reference concentration was calculated using 2× the mean background concentration as recommended by USEPA Region 4 in *Supplemental Guidance to RAGs: Region 4 Bulletin No. 1* (USEPA, 1995).
b = Maximum detected concentration exceeds Region 3 RBC but does not exceed site reference concentration; therefore, parameter is not a COPC.
c = The lead screening value of 400 mg/kg was used as recommended by USEPA (USEPA, 1994).

Surrogates:

Chlordane used as a surrogate for alpha- and gamma-chlordane.

Table 8-6
Benzo(a)pyrene Equivalent Calculations
Assembly F
NSA Mid-South, Millington, TN

SWMU 22 Soil

Sample ID	Detected Concentration µg/kg	Actual or Estimated Concentration[1] µg/kg	Validation Qualifier	TEF[2]	Parameter	BEQ[3] µg/kg
022SGB0301	420	210	U	0.1	Benzo(a)anthracene	21
	58	58	J	1	Benzo(a)pyrene	58
	77	77	J	0.1	Benzo(b)fluoranthene	7.7
	60	60	J	0.01	Benzo(k)fluoranthene	0.6
	53	53	J	0.001	Chrysene	0.053
	420	210	U	1	Dibenz(a,h)anthracene	210
	48	48	J	0.1	Indeno(1,2,3-cd)pyrene	4.8
					Total for Sample	302.2

Sample ID	Detected Concentration µg/kg	Actual or Estimated Concentration[1] µg/kg	Validation Qualifier	TEF[2]	Parameter	BEQ[3] µg/kg
022SGB0401	140	140	J	0.1	Benzo(a)anthracene	14
	320	320	J	1	Benzo(a)pyrene	320
	400	400	J	0.1	Benzo(b)fluoranthene	40
	330	330	J	0.01	Benzo(k)fluoranthene	3.3
	240	240	J	0.001	Chrysene	0.24
	110	110	J	1	Dibenz(a,h)anthracene	110
	290	290	J	0.1	Indeno(1,2,3-cd)pyrene	29
					Total for Sample	516.5

Notes:

TEF = Toxicity Equivalent Factor
J = Estimated value
U = Chemical was not detected at reported sample quantitation limit

1 = Actual or estimated concentration represents parameter detections and one-half the sample quantitation limits for nondetects.
2 = TEFs are as provided in USEPA, 1993.
3 = BEQ is the product of the actual or estimated concentration and the TEF.

Table 8-7
Chemicals Present in SWMU 17 Soil Samples
Assembly F
NSA Mid-South, Millington, Tennessee

Chemical	Units	Detection Frequency	Range of Nondetects	Range of Detected Concentrations	Average Detected Concentration	Region 3 Industrial RBC	RC[a]	Selected as COPC
Antimony	mg/kg	3 / 3	NA	0.51 – 9	3.36	82	ND	No
Arsenic	mg/kg	10 / 10	NA	2.2 – 9.5	4.81	4	20.32	No[b]
Barium	mg/kg	10 / 10	NA	47.25 – 108	71.7	14,308	265.12	No
Beryllium	mg/kg	5 / 10	0.29 – 0.34	0.39 – 0.54	0.446	409	1.004	No
Cadmium	mg/kg	4 / 10	0.04 – 0.21	0.06 – 2.8	0.79	204	3.24	No
Chromium	mg/kg	10 / 10	NA	9.75 – 16.3	12.2	613	28.28	No
Cobalt	mg/kg	10 / 10	NA	3.3 – 8	6.11	12,264	14.36	No
Copper	mg/kg	10 / 10	NA	12.5 – 19.5	15.2	8,176	32.52	No
Lead[d]	mg/kg	10 / 10	NA	7.3 – 14.4	8.89	NSV	19.8	No
Mercury	mg/kg	9 / 10	0.13 – 0.13	0.01 – 0.04	0.022	61	0.176	No
Nickel	mg/kg	10 / 10	NA	13.2 – 18.8	15.7	4,088	ND	No
Selenium	mg/kg	1 / 10	0.26 – 0.43	0.62 – 0.62	0.62	1,022	ND	No
Tin	mg/kg	1 / 10	0.55 – 2.0	25.40 – 25.4	25.4	122,640	ND	No
Vanadium	mg/kg	10 / 10	NA	15.6 – 23.6	19.1	1,431	43.68	No
Zinc	mg/kg	10 / 10	NA	35.6 – 64.1	46.4	61,320	109	No
4,4'-DDD	µg/kg	1 / 10	4.2 – 4.4	3.8 – 3.8	3.8	23,847	NA	No
4,4'-DDE	µg/kg	1 / 10	4.2 – 4.4	4.8 – 4.8	4.8	16,833	NA	No
4,4'-DDT	µg/kg	1 / 10	4.2 – 4.4	2.4 – 2.4	2.4	16,833	NA	No
alpha-Chlordane	µg/kg	1 / 1	NA	2.6 – 2.6	2.6	16,352	NA	No
Endosulfan II	µg/kg	1 / 10	4.2 – 4.4	4.4 – 4.4	4.4	1,226,400	NA	No
Endrin	µg/kg	1 / 10	4.2 – 4.4	5.6 – 5.6	5.6	61,320	NA	No
Endrin aldehyde	µg/kg	1 / 10	4.2 – 4.4	2.3 – 2.3	2.3	61,320	NA	No
Heptachlor epoxide	µg/kg	1 / 10	2.2 – 2.3	2.3 – 2.3	2.3	629	NA	No
2-Methylnaphthalene	µg/kg	1 / 10	420 – 440	15000 – 15000	15000	4,088,000	NA	No
bis(2-Ethylhexyl)phthalate (BEHP)	µg/kg	2 / 10	420 – 8800	90.5 – 160	125	408,800	NA	No
Diethylphthalate	µg/kg	2 / 10	420 – 8800	54 – 54	54	163,520,000	NA	No
Naphthalene	µg/kg	1 / 10	420 – 440	8700 – 8700	8700	4,088,000	NA	No
Phenanthrene	µg/kg	1 / 10	420 – 440	1100 – 1100	1100	6,132,000	NA	No
Acetone	µg/kg	5 / 10	63 – 130	15 – 50	30.2	20,440,000	NA	No
Benzene	µg/kg	3 / 10	6.3 – 130	2.3 – 3.3	2.7	197,352	NA	No
Ethylbenzene	µg/kg	1 / 10	6.3 – 6.7	370 – 370	370	20,440,000	NA	No
Styrene	µg/kg	1 / 10	6.3 – 6.7	31 – 31	31	40,880,000	NA	No
Tetrachloroethene	µg/kg	2 / 10	6.3 – 6.7	1.6 – 17	9.30	110,062	NA	No
Toluene	µg/kg	1 / 10	6.3 – 6.7	140 – 140	140	40,880,000	NA	No
Xylene (Total)	µg/kg	2 / 10	6.3 – 6.7	2 – 1400	701	408,800,000	NA	No

Notes:

RBC =risk-based concentration
RC = reference concentration
COPC = chemical of potential concern
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
ND = Analyte was not detected in background soils.
NA = not applicable
NSV = no screening value

a = Screening toxicity values are the residential and industrial soil concentrations presented in the Region 3 Risk-Based Concentration Table, (USEPA, October 19 Screening values for noncarcinogens have been adjusted from the target hazard quotient of 1 to 0.1.
b = Reference concentration was calculated using 2× the mean background concentration as recommended by USEPA Region 4 in *Supplemental Guidance to RAGs: Region 4 Bulletin No. 1* (USEPA, 1995).
c = Maximum detected concentration exceeds Region 3 RBC but does not exceed site reference concentration; therefore, parameter is not a COPC.
d = The lead screening value of 400 mg/kg was used as recommended by USEPA (USEPA, 1994).

Surrogates:

Mercuric chloride was used as a surrogate for mercury.
Chlordane was used as a surrogate for alpha-chlordane.
Endosulfan was used a surrogate for Endosulfan II.
Endrin was used as a surrogate for endrin aldehyde.

Table 8-7
Chemicals Present in SWMU 17 Soil Samples
Assembly F
NSA Mid-South, Millington, Tennessee

Chemical	Units	Detection Frequency	Range of Nondetects	Range of Detected Concentrations	Average Detected Concentration	Region 3 Industrial RBC	RC[a]	Selected as COPC

Pyrene was used as a surrogate for phenanthrene.

Table 8-8
Chemicals Present in SWMU 19 Soil Samples
Assembly F
NSA Mid-South, Millington, Tennessee

Chemical	Units	Detection Frequency	Range of Nondetects	Range of Detected Concentrations	Average Detected Concentration	Region 3 Industrial RBC	RC[a]	Selected as COPC
Arsenic	mg/kg	6 / 6	NA	5.5 – 11.1	7.83	4	20.32	No[b]
Barium	mg/kg	6 / 6	NA	76.25 – 172	131	14,308	265.12	No
Beryllium	mg/kg	6 / 6	NA	0.37 – 0.53	0.47	409	1.004	No
Cadmium	mg/kg	5 / 6	0.04 – 0.04	0.05 – 0.88	0.404	204	3.24	No
Chromium	mg/kg	6 / 6	NA	9.2 – 14.2	12.2	613	28.28	No
Cobalt	mg/kg	6 / 6	NA	5.6 – 10.5	7.67	12,264	14.36	No
Copper	mg/kg	6 / 6	NA	10.6 – 18.3	15.2	8,176	32.52	No
Lead[d]	mg/kg	6 / 6	NA	8.1 – 96.6	38.5	NSV	19.8	No[c]
Mercury	mg/kg	4 / 6	0.13 – 0.13	0.02 – 0.03	0.025	61	0.176	No
Nickel	mg/kg	6 / 6	NA	15.05 – 20.3	17.1	4,088	ND	No
Selenium	mg/kg	1 / 6	0.25 – 0.42	0.37 – 0.37	0.37	1,022	ND	No
Silver	mg/kg	1 / 6	0.12 – 0.78	0.21 – 0.21	0.21	1,022	ND	No
Tin	mg/kg	2 / 6	0.9 – 1.3	21.3 – 37.6	29.5	122,640	ND	No
Vanadium	mg/kg	6 / 6	NA	17 – 26.4	21.7	1,431	43.68	No
Zinc	mg/kg	6 / 6	NA	49.3 – 166	78.2	61,320	109	No
4,4'-DDE	µg/kg	1 / 6	4.2 – 4.4	5.6 – 5.6	5.6	16,833	NA	No
4,4'-DDT	µg/kg	1 / 6	4.2 – 4.3	4.8 – 4.8	4.8	16,833	NA	No
Dieldrin	µg/kg	1 / 6	4.2 – 4.4	0.14 – 0.14	0.14	358	NA	No
Endosulfan II	µg/kg	2 / 6	4.2 – 4.3	4 – 7.7	5.85	1,226,400	NA	No
Heptachlor	µg/kg	2 / 6	2.1 – 2.2	0.3 – 2.8	1.55	1,272	NA	No
Heptachlor epoxide	µg/kg	1 / 6	2.1 – 2.2	1.9 – 1.9	1.9	629	NA	No
2-Methylnaphthalene	µg/kg	2 / 6	420 – 430	7600 – 9400	8500	4,088,000	NA	No
Chrysene	µg/kg	1 / 6	420 – 8800	30 – 30	30	784,000	NA	No
Naphthalene	µg/kg	2 / 6	420 – 430	3600 – 4400	4000	4,088,000	NA	No
Phenanthrene	µg/kg	1 / 6	420 – 8800	56 – 56	56	6,132,000	NA	No
Pyrene	µg/kg	2 / 6	420 – 8800	28 – 87	57.5	6,132,000	NA	No
bis(2-Ethylhexyl)phthalate (BEHP)	µg/kg	5 / 6	420 – 420	78 – 1800	750.4	408,800	NA	No
2-Butanone (MEK)	µg/kg	2 / 6	32 – 1600	15 – 56	35.5	122,640,000	NA	No
4-Methyl-2-Pentanone (MIBK)	µg/kg	2 / 6	32 – 1600	13 – 20	16.5	16,352,000	NA	No
Acetone	µg/kg	5 / 6	1600 – 1600	45 – 330	177.4	20,440,000	NA	No
Benzene	µg/kg	2 / 6	6.4 – 6.6	63 – 250	157	197,352	NA	No
Carbon disulfide	µg/kg	1 / 6	6.4 – 1600	1.7 – 1.7	1.7	20,440,000	NA	No
Ethylbenzene	µg/kg	2 / 6	6.4 – 6.6	280 – 1800	1040	20,440,000	NA	No
Styrene	µg/kg	1 / 6	6.4 – 1600	15 – 15	15	40,880,000	NA	No
Toluene	µg/kg	3 / 6	6.4 – 6.6	1.7 – 3000	1064	40,880,000	NA	No
Xylene (Total)	µg/kg	2 / 6	6.4 – 6.6	1600 – 12000	6800	408,800,000	NA	No

Notes:

RBC = Screening toxicity values are the residential and industrial soil concentrations presented in the Region 3 Risk-Based Concentration Table, (USEPA, October 1999). Screening values for noncarcinogens have been adjusted from the target hazard quotient of 1 to 0.1.
COPC = chemical of potential concern
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
ND = Analyte was not detected in background soils.
NA = not applicable
NSV = no screening value

a = Reference concentration was calculated using 2× the mean background concentration as recommended by USEPA Region 4 in *Supplemental Guidance to RAGs: Region 4 Bulletin No. 1* (USEPA, 1995).
b = Maximum detected concentration exceeds Region 3 RBC but does not exceed site reference concentration; therefore, parameter is not a COPC.
c = The mean lead value was greater than the reference concentration but is not a COPC based on the interim soil lead guidance of 400 mg/kg for residential land use as cited in Office of Solid Waste and Emergency Response Directive 9355.4-12 (USEPA, 1994).
d = The lead screening value of 400 mg/kg was used as recommended by USEPA (USEPA, 1994).

Surrogates:

Endosulfan was used as a surrogate for Endosulfan II.
Pyrene was used as a surrogate for phenanthrene.

Table 8-9
Chemicals Present in SWMU 20 Soil Samples
Assembly F
NSA Mid-South, Millington, Tennessee

Chemical	Units	Detection Frequency	Range of Nondetects	Range of Detected Concentrations	Average Detected Concentration	Region 3 Industrial RBC	RC[a]	Selected as COPC
Arsenic	mg/kg	2 / 2	NA	8.8 – 12	10.4	3.82	20.32	No[b]
Barium	mg/kg	2 / 2	NA	82.4 – 140	111.2	14,308	265.12	No
Beryllium	mg/kg	2 / 2	NA	0.38 – 0.47	0.425	409	1.004	No
Chromium	mg/kg	2 / 2	NA	10.8 – 11.4	11.1	613	28.28	No
Cobalt	mg/kg	2 / 2	NA	6.4 – 8.6	7.5	12,264	14.36	No
Copper	mg/kg	2 / 2	NA	14.2 – 15.1	14.65	8,176	32.52	No
Lead[c]	mg/kg	2 / 2	NA	12.7 – 13.3	13	NSV	19.8	No
Mercury	mg/kg	2 / 2	NA	0.03 – 0.03	0.03	61	0.176	No
Nickel	mg/kg	2 / 2	NA	15.7 – 22.3	19	4,088	ND	No
Selenium	mg/kg	2 / 2	NA	0.18 – 0.27	0.225	1,022	ND	No
Silver	mg/kg	1 / 2	0.56 – 0.56	2.1 – 2.1	2.1	1,022	ND	No
Vanadium	mg/kg	2 / 2	NA	20.7 – 21.9	21.3	1,431	43.68	No
Zinc	mg/kg	2 / 2	NA	41.8 – 44.1	42.95	61,320	109	No
Aldrin	µg/kg	2 / 2	NA	1.1 – 4	2.55	337	NA	No
Dieldrin	µg/kg	1 / 2	4 – 4	3.9 – 3.9	3.9	358	NA	No
bis(2-Ethylhexyl)phthalate (BEHP)	µg/kg	1 / 2	400 – 400	780 – 780	780	408,800	NA	No
1,1,1-Trichloroethane	µg/kg	12 / 23	5 – 12	14 – 160	76.25	4,088,000	NA	No
1,1,2-Trichloroethane	µg/kg	2 / 23	5 – 16	7 – 7	7	100,407	NA	No
1,1-Dichloroethane	µg/kg	16 / 23	5 – 12	1.4 – 1100	159.7813	20,440,000	NA	No
1,1-Dichloroethene	µg/kg	18 / 23	5 – 12	7 – 400	107.0333	9,539	NA	No
1,2-Dichloroethene (total)	µg/kg	5 / 19	10 – 20	2 – 8.1	5.4	1,839,600	NA	No
1,2-Dichloropropane	µg/kg	3 / 23	5 – 16	3.3 – 11	6.1667	84,165	NA	No
2-Butanone (MEK)	µg/kg	4 / 23	12 – 50	12 – 38	24.75	122,640,000	NA	No
4-Methyl-2-Pentanone (MIBK)	µg/kg	2 / 23	12 – 50	4.4 – 52	28.2	16,352,000	NA	No
Acetone	µg/kg	6 / 23	13 – 100	41 – 160	96.5	20,440,000	NA	No
Benzene	µg/kg	6 / 23	5 – 12	2.5 – 5	3.4333	197,352	NA	No
Ethylbenzene	µg/kg	4 / 23	5 – 16	12 – 32	17.75	20,440,000	NA	No
Methylene chloride	µg/kg	9 / 23	10 – 13	12 – 170	75	763,093	NA	No
Tetrachloroethene	µg/kg	4 / 23	5 – 16	56 – 210	103.75	110,062	NA	No
Toluene	µg/kg	5 / 23	5 – 16	1 – 31	13.8	40,880,000	NA	No
Trichloroethene	µg/kg	5 / 23	5 – 16	4 – 79	40	520,291	NA	No
Xylene (Total)	µg/kg	6 / 12	5 – 12	5 – 140	53.1667	408,800,000	NA	No

Notes:
RBC = Screening toxicity values are the residential and industrial soil concentrations presented in the Region 3 Risk-Based Concentration Table, (USEPA, October 1999). Screening values for noncarcinogens have been adjusted from the target hazard quotient of 1 to 0.1.
COPC = chemical of potential concern
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
ND = Analyte was not detected in background soils.
NA = not applicable
NSV = no screening value

a = Reference concentration was calculated using 2× the mean background concentration as recommended by USEPA Region 4 in *Supplemental Guidance to RAGs: Region 4 Bulletin No. 1* (USEPA, 1995).
b = Maximum detected concentration exceeds Region 3 RBC but does not exceed site reference concentration; therefore, parameter is not a COPC.
c = The lead screening value of 400 mg/kg was used as recommended by USEPA (USEPA, 1994).

Table 8-10
Chemicals Present in SWMU 22 Soil Samples
Assembly F
NSA Mid-South, Millington, Tennessee

Chemical	Units	Detection Frequency	Range of Nondetects	Range of Detected Concentrations	Average Detected Concentration	Region 3 Industrial RBC	RC[a]	Selected as COPC
Arsenic	mg/kg	2 / 2	NA	12.5 – 22.2	17.35	3.8	20.32	Yes
Barium	mg/kg	2 / 2	NA	45.2 – 51.9	48.55	14,308	265.12	No
Beryllium	mg/kg	2 / 2	NA	0.34 – 0.36	0.35	408.8	1.004	No
Chromium	mg/kg	2 / 2	NA	12.3 – 13.8	13.05	613	28.28	No
Cobalt	mg/kg	2 / 2	NA	4.9 – 6.7	5.8	12,264	14.36	No
Copper	mg/kg	2 / 2	NA	11.2 – 12.5	11.85	8,176	32.52	No
Lead[b]	mg/kg	2 / 2	NA	12.4 – 35.1	23.75	NSV	19.8	No
Mercury	mg/kg	2 / 2	NA	0.04 – 0.04	0.04	61	0.176	No
Nickel	mg/kg	2 / 2	NA	8.9 – 12.1	10.5	4,088	ND	No
Selenium	mg/kg	1 / 2	0.35 – 0.35	0.51 – 0.51	0.51	10,220	ND	No
Thallium	mg/kg	1 / 2	0.24 0.24	0.33 – 0.33	0.33	14.308	ND	No
Vanadium	mg/kg	2 / 2	NA	25.4 – 26.7	26.05	143	43.68	No
Zinc	mg/kg	2 / 2	NA	35.3 – 37.6	36.45	6.132	109	No
2,4,5-TP (Silvex)	µg/kg	1 / 2	0.95 – 0.95	1.9 – 1.9	1.9	1,635,200	NA	No
2-Methylnaphthalene	µg/kg	1 / 2	410 – 410	360 – 360	360	4.088,000	NA	No
Acenaphthylene	µg/kg	1 / 2	420 – 420	110 – 110	110	12.264.000	NA	No
Anthracene	µg/kg	1 / 2	420 – 420	77 – 77	77	61.320,000	NA	No
Benzo(a)anthracene	µg/kg	1 / 2	420 – 420	140 – 140	140	7,840	NA	No
Benzo(a)pyrene	µg/kg	2 / 2	NA	58 – 320	189	784	NA	Yes
Benzo(b)fluoranthene	µg/kg	2 / 2	NA	77 – 400	238.5	7.840	NA	No
Benzo(g,h,i)perylene	µg/kg	2 / 2	NA	40 – 61	50.5	6,132,000	NA	No
Benzo(k)fluoranthene	µg/kg	2 / 2	NA	60 – 330	195	78.400	NA	No
Chrysene	µg/kg	2 / 2	NA	53 – 240	146.5	784,000	NA	No
Dibenz(a,h)anthracene	µg/kg	1 / 2	420 – 420	110 – 110	110	784	NA	Yes
Fluoranthene	µg/kg	2 / 2	NA	75 – 140	107.5	8.176,000	NA	No
Indeno(1,2,3-cd)pyrene	µg/kg	2 / 2	NA	48 – 290	169	7.840	NA	No
Naphthalene	µg/kg	1 / 2	410 – 410	280 – 280	280	4,088,000	NA	No
Pyrene	µg/kg	2 / 2	NA	65 – 240	152.5	6.132,000	NA	No
bis(2-Ethylhexyl)phthalate (BEHP)	µg/kg	1 / 2	420 – 420	74 – 74	74	408.800	NA	No
1,1,2-Trichloroethane	µg/kg	2 / 16	10 – 12	21 – 29	25	100.407	NA	No
2-Butanone (MEK)	µg/kg	2 / 16	12 – 50	150 – 200	175	122,640,000	NA	No
Acetone	µg/kg	4 / 16	100 – 100	31 – 400	139.75	20.440,000	NA	No
Carbon disulfide	µg/kg	2 / 16	10 – 12	51 – 77	64	20.440,000	NA	No
Ethylbenzene	µg/kg	1 / 16	10 – 12	81 – 81	81	20.440,000	NA	No
Methylene chloride	µg/kg	1 / 16	10 – 30	650 – 650	650	763,093	NA	No
m-Xylene	µg/kg	1 / 13	20 – 20	63 – 63	63	408,800,000	NA	No

Notes:

RBC = Screening toxicity values are the residential and industrial soil concentrations presented in the Region 3 Risk-Based Concentration Table. (USEPA, October 1
Screening values for noncarcinogens have been adjusted from the target hazard quotient of 1 to 0.1.
COPC = chemical of potential concern
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
ND = Analyte was not detected in background soils.
NA = not applicable
NSV = No screening value available.

a = Reference concentration was calculated using 2× the mean background concentration as recommended by USEPA Region 4 in *Supplemental Guidance to RAGs: Region 4 Bulletin No. 1* (USEPA, 1995).
b = The lead screening value of 400 mg/kg was used as recommended by USEPA (USEPA, 1994).

Surrogates:

Mercuric chloride was used as a surrogate for mercury.
Acenaphthene was used as a surrogate for acenaphthylene.
Pyrene was used as a surrogate for benzo(g,h,i)perylene.

Table 8-11
Chemicals Present in SWMU 39 Soil Samples
Assembly F
NSA Mid-South, Millington, Tennessee

Chemical	Units	Detection Frequency	Range of Nondetects	Range of Detected Concentrations	Average Detected Concentration	Region 3 Industrial RBC	RC[a]	Selected as COPC
Arsenic	mg/kg	2 / 2	NA	2.9 – 5.4	4.15	3.8	20.32	No[b]
Barium	mg/kg	2 / 2	NA	68.4 – 157	113	14,308	265.12	No
Cadmium	mg/kg	1 / 2	0.48 – 0.48	1.0 – 1.0	1.00	204	3.24	No
Chromium	mg/kg	2 / 2	NA	8.5 – 10.3	9.4	613	28.28	No
Cobalt	mg/kg	2 / 2	NA	5.0 – 11.6	8.3	12,264	14.36	No
Copper	mg/kg	2 / 2	NA	12.4 – 16.2	14.3	8,176	32.52	No
Lead[c]	mg/kg	2 / 2	NA	44 – 155	99.5	NTX	19.8	No
Mercury	mg/kg	2 / 2	NA	0.07 – 0.08	0.08	61	0.176	No
Nickel	mg/kg	2 / 2	NA	14.3 – 16.4	15.4	4,088	ND	No
Vanadium	mg/kg	2 / 2	NA	15.4 – 22.8	19.1	1,431	43.68	No
Zinc	mg/kg	2 / 2	NA	60.3 – 172	116	61,320	109	No
Aroclor-1260	µg/kg	1 / 15	39 – 43	43 – 43	43	2,862	NA	No
4,4'-DDD	µg/kg	1 / 2	4.4 – 4.4	88 – 88	88	23,847	NA	No
4,4'-DDE	µg/kg	2 / 2	NA	5.6 – 260	133	16,833	NA	No
4,4'-DDT	µg/kg	2 / 2	NA	18.00 – 380	199	16,833	NA	No
Dieldrin	µg/kg	1 / 2	4 – 4	130 – 130	130	358	NA	No
Endosulfan I	µg/kg	1 / 2	2.2 – 2.2	15 – 15	15	1,226,400	NA	No
Endrin ketone	µg/kg	1 / 2	4 – 4	2.5 – 2.5	2.5	61,320	NA	No
Heptachlor	µg/kg	1 / 2	2 – 2	4.6 – 4.6	4.6	1,272	NA	No
Technical Chlordane	µg/kg	1 / 2	40 – 40	1200 – 1200	1200	16,352	NA	No
alpha-Chlordane	µg/kg	1 / 2	4 – 4	140 – 140	140	16,352	NA	No
gamma-Chlordane	µg/kg	2 / 2	NA	2.6 – 170	86.3	16,352	NA	No
1,1,2,2-Tetrachloroethane	µg/kg	2 / 45	5 – 1600	190 – 30000	15095	28,616	NA	No
2-Butanone (MEK)	µg/kg	1 / 45	12 – 10000	26.5 – 26.5	26.5	122,640,000	NA	No
Acetone	µg/kg	4 / 45	12 – 10000	25 – 480	142.5	20,440,000	NA	No
Carbon disulfide	µg/kg	2 / 45	6 – 10000	27.5 – 39	33.3	20,440,000	NA	No
Ethylbenzene	µg/kg	10 / 45	5 – 1600	10 – 18000	2137	20,440,000	NA	No
Methylene chloride	µg/kg	7 / 45	6 – 10000	16 – 77000	11197	763,093	NA	No
Tetrachloroethene	µg/kg	1 / 45	5 – 1600	95.5 – 95.5	95.5	110,062	NA	No
Toluene	µg/kg	1 / 45	5 – 1600	15.5 – 15.5	15.5	40,880,000	NA	No
Trichloroethene	µg/kg	1 / 45	5 – 1600	18 – 18	18	520,291	NA	No
Xylene (Total)	µg/kg	8 / 32	5 – 1600	2.0 – 6250	1596	408,800,000	NA	No
cis-1,2-Dichloroethene	µg/kg	3 / 20	5 – 1000	1.9 – 14.5	7.20	2,044,000	NA	No
m-Xylene	µg/kg	1 / 13	20 – 20	110000 – 110000	110000	408,800,000	NA	No
o-Xylene	µg/kg	1 / 13	10 – 10	56000 – 56000	56000	408,800,000	NA	No

Notes:

RBC = Screening toxicity values are the residential and industrial soil concentrations presented in the Region 3 Risk-Based Concentration Table, (USEPA, October 1999) Screening values for noncarcinogens have been adjusted from the target hazard quotient of 1 to 0.1.

COPC = chemical of potential concern

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

ND = Analyte was not detected in background soils.

NA = not applicable

a = Reference concentration was calculated using 2× the mean background concentration as recommended by USEPA Region 4 in *Supplemental Guidance to RAGs: Region 4 Bulletin No. 1* (USEPA, 1995).

b = Maximum detected concentration exceeds Region 3 RBC but does not exceed site reference concentration; therefore, parameter is not a COPC.

c = The lead screening value of 400 mg/kg was used as recommended by USEPA (USEPA, 1994).

Surrogates:

Endosulfan was used as surrogate for Endosulfan I.

Table 8-13
Chemicals Present in SWMU 17 Groundwater Samples
Assembly F
NSA Mid-South, Millington, Tennessee

Chemical	Units	Detection Frequency	Range of Nondetects	Range of Detected Concentrations	Average Detected Concentration	Region 3 RBC	Selected as COPC
1,1,1-Trichloroethane	µg/L	1 / 5	5 – 5	5.7 – 5.7	5.7	54.09	No
1,2-Dichloropropane	µg/L	1 / 5	5 – 5	28 – 28	28	0.16	Yes
Benzene	µg/L	1 / 5	5 – 5	1.1 – 1.1	1.1	0.36	Yes

Notes:
RBC = Screening toxicity values are the tap-water concentrations presented in the Region 3 Risk-Based Concentration Table, (USEPA, October 1999). Screening values for noncarcinogens have been adjusted from the target hazard quotient of 1 to 0.1.
COPC = chemical of potential concern
µg/L = micrograms per liter

Table 8-14
Chemicals Present in SWMU 19 Groundwater Samples
Assembly F
NSA Mid-South, Millington, Tennessee

Chemical	Units	Detection Frequency	Range of Nondetects	Range of Detected Concentrations	Average Detected Concentration	Region 3 RBC	Selected as COPC
4-Methyl-2-Pentanone (MIBK)	µg/L	1 / 3	25 – 25	1.1 – 1.1	1.1	13.9	No

Notes:
RBC = Screening toxicity values are the tap-water concentrations presented in the Region 3 Risk-Based Concentration Table, (USEPA, October 1999). Screening values for noncarcinogens have been adjusted from the target hazard quotient of 1 to 0.1.
COPC = chemical of potential concern
µg/L = micrograms per liter

Table 8-15
Chemicals Present in SWMU 20 Groundwater Samples
Assembly F
NSA Mid-South, Millington, Tennessee

Chemical	Units	Detection Frequency	Range of Nondetects	Range of Detected Concentrations	Average Detected Concentration	Region 3 RBC	Selected as COPC
1,1,1-Trichloroethane	µg/L	1 / 18	3 – 10	21 – 21	21	54.09	No
1,1,2-Trichloroethane	µg/L	1 / 18	3 – 10	17 – 17	17	0.19	Yes
1,1-Dichloroethane	µg/L	1 / 18	3 – 10	320 – 320	320	79.84	Yes
1,1-Dichloroethene	µg/L	1 / 18	3 – 10	60.3 – 60.3	60.3	0.19	Yes
1,2-Dichloroethane	µg/L	1 / 18	3 – 10	6 – 6	6	0.19	Yes
2-Butanone (MEK)	µg/L	2 / 14	25 – 50	14 – 695	354.5	190.61	Yes
Acetone	µg/L	1 / 15	10 – 100	230 – 230	230	60.83	Yes
Benzene	µg/L	1 / 18	3 – 10	7 – 7	7	0.19	Yes

Notes:
RBC = Screening toxicity values are the tap-water concentrations presented in the Region 3 Risk-Based Concentration Table, (USEPA, October 1999). Screening values for noncarcinogens have been adjusted from the target hazard quotient of 1 to 0.1.
COPC = chemical of potential concern
µg/L = micrograms per liter

Table 8-16
Chemicals Present in SWMU 22 Groundwater Samples
Assembly F
NSA Mid-South, Millington, Tennessee

Chemical	Units	Detection Frequency	Range of Nondetects	Range of Detected Concentrations	Average Detected Concentration	Region 3 RBC	Selected as COPC
Ethylbenzene	µg/L	1 / 3	5 – 10	49 – 49	49	133,987	No
m-Xylene	µg/L	1 / 3	20 – 20	54 – 54	54	1,216,667	No

Notes:

RBC = Screening toxicity values are the tap-water concentrations presented in the Region 3 Risk-Based Concentration Tabl Table, (USEPA, October 1999). Screening values for noncarcinogens have been adjusted from the target hazard quotient of 1 to 0.1.

COPC = chemical of potential concern

Table 8-17
Chemicals Present in SWMU 39 Groundwater Samples
Assembly F
NSA Mid-South, Millington, Tennessee

Chemical	Units	Detection Frequency	Range of Nondetects	Range of Detected Concentrations	Average Detected Concentration	Region 3 RBC	Infrequent Detection[a]	Selected as COPC
Loess Groundwater								
1,2-Dichloroethene (total)	µg/L	1 / 16	5 – 10	26 – 26	26	5.48	NA	Yes
2-Butanone (MEK)	µg/L	2 / 18	20 – 50	22 – 200	111	191	NA	Yes
4-Methyl-2-Pentanone (MIBK)	µg/L	1 / 18	5 – 50	4.3 – 4.3	4.3	13.90	NA	No
Acetone	µg/L	1 / 18	20 – 100	39 – 39	39	60.83	NA	No
Benzene	µg/L	1 / 19	1 – 10	2 – 2	2	0.36	NA	Yes
Ethylbenzene	µg/L	2 / 19	1 – 10	120 – 260	190	134	NA	Yes
Toluene	µg/L	1 / 19	2 – 10	11 – 11	11	74.70	NA	No
Trichloroethene	µg/L	2 / 19	1 – 10	13 – 18	15.5	1.55	NA	Yes
Xylene (Total)	µg/L	1 / 14	5 – 10	830 – 830	830	1217	NA	No
m-Xylene	µg/L	2 / 3	20 – 20	36 – 1050	543	1217	NA	No
o-Xylene	µg/L	1 / 5	1 – 10	30 – 30	30	1217	NA	No
Fluvial Deposits Groundwater								
Ethylbenzene	µg/L	5 / 207	1 – 10	2.51 – 33	9.762	134	NA	No
n-Propylbenzene	µg/L	3 / 133	1 – 2	2.48 – 24.8	12.96	6.08	Yes	No
n-Butylbenzene	µg/L	2 / 133	1 – 2	2.05 – 12.1	7.075	6.08	Yes	No
1,2-Dichloroethane	µg/L	4 / 207	1 – 10	1.52 – 4.46	2.9875	0.12	Yes	No
m-Xylene	µg/L	1 / 4	20 – 20	130 – 130	130	1217	NA	No
Benzene, 1,3,5-trimethyl-	µg/L	3 / 127	1 – 2	15.9 – 75.3	43.9	1.23	Yes	No
Toluene	µg/L	5 / 207	1 – 10	0.3 – 3.4	2.03	75	NA	No
Xylene (Total)	µg/L	11 / 97	1 – 10	0.37 – 38.1	14.2045	1217	NA	No
sec-Butylbenzene	µg/L	2 / 133	1 – 2	1.94 – 7.19	4.565	6.08	Yes	No
cis-1,2-Dichloroethene	µg/L	3 / 139	1 – 5	1.1 – 6	2.74	6.08	NA	No
1,2-Dichloroethene (total)	µg/L	4 / 68	3 – 20	2 – 23	9.25	5.48	No	Yes
Acetone	µg/L	26 / 152	5 – 100	1 – 460	46.2615	61	No	Yes
Chloromethane	µg/L	3 / 207	1 – 10	6.6 – 15	10.1667	2.11	Yes	No
Methylene chloride	µg/L	1 / 207	2 – 50	11 – 11	11	4.10	Yes	No
Carbon disulfide	µg/L	2 / 169	1 – 10	1 – 1.3	1.15	104	NA	No
2-Butanone (MEK)	µg/L	2 / 169	5 – 50	26 – 30	28	191	NA	No
Trichloroethene	µg/L	19 / 207	1 – 10	1.2 – 160	48.6353	1.55	No	Yes
o-Xylene	µg/L	4 / 125	1 – 10	6.23 – 64	25.1075	1217	NA	No
Benzene, 1,2,4-trimethyl	µg/L	3 / 133	1 – 2	31.2 – 150	86.4	1.23	Yes	No
tert-Butylbenzene	µg/L	2 / 133	1 – 2	1.56 – 3.11	2.335	6.08	NA	No
Benzene, 1-methylethyl-	µg/L	2 / 121	1 – 2	2.75 – 9.67	6.21	66	NA	No
p-Isopropyltoluene	µg/L	3 / 133	1 – 2	1.61 – 9.28	5.2833	75	NA	No

Notes:

RBC = Screening toxicity values are the tap-water concentrations presented in the Region 3 Risk-Based Concentration Table, (USEPA, October 1999). Screening values for noncarcinogens have been adjusted from the target hazard quotient of 1 to 0.1.

COPC = chemical of potential concern

µg/L = micrograms per liter

a = For sample populations greater than 20, infrequent detection is equal to 0.05. Samples detected at a frequency less than 0.05 are selected as COPCs if the maximum concentration is greater than the RBC and the chemical is not detected in any other medium.

Surrogate:

Toluene was used as a surrogate for n-isopropyltoluene.

Table 8-18
Assembly F COPCs
NSA Mid-South, Millington, TN

SWMU	COPCs
17	1,2-dichloropropane, benzene
19	none identified
20	1,1,2-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, 2-butanone, acetone, benzene
22	non identified
39 Loess	1,2-dichloroethene (total), 2-butanone, benzene, ethylbenzene, trichloroethene
39 Fluvial Deposits	1,2-dichloroethene (total), acetone, trichloroethene

Table 8-19A
95% UCL Concentration in Fluvial Deposits Groundwater
Acetone Detections Only
Assembly F: SWMU 39
NSA Mid-South, Millington, TN

Number of samples		Uncensored values	
Uncensored	26	Mean	46.26
Censored		Lognormal mean	43.99
Detection limit or PQL		Std. devn.	100.7689
Method detection limit		Median	6
TOTAL	26	Min.	1
		Max.	460

Lognormal distribution?		Normal distribution?	
r-squared is:	0.917	r-squared is:	0.478

Recommendations: Use lognormal distribution.

UCL: UCL (Land's method) is 145.01

Data used for calculation:

Result	Sample ID
460	039G001540
89.9	039G005840
33.2	039G006040
25.4	039G006140
30.2	039G006440
110	039G001550
71.2	039G005850
38.5	039G006450
24.4	039G006550
10	039G002143
4	039G03LF43
6	039G05LF43
1	039G04LF47
2	039G09LF48
260	039G001350
2	039G04LF57
3	039G04LF61
3	039G09LF62
2	039G04LF69
3	039G02LF71
2	039G09LF71
5	039G03LF73
6	039G02LF85
7	039G08LF91
2	039G09LF91
2	039G03LF99

Table 8-19B
95% UCL Concentration in Fluvial Deposits Groundwater
All Acetone Data
Assembly F: SWMU 39
NSA Mid-South, Millington, TN

Number of samples		Uncensored values	
Uncensored	152	Mean	20.55
Censored		Lognormal mean	17.91
Detection limit or PQL		Std. devn.	43.622789
Method detection limit		Median	10
TOTAL	152	Min.	1
		Max.	460

Lognormal distribution?		Normal distribution?	
r-squared is:	− 0.821	r-squared is:	0.263

Recommendations: Lognormal distribution assumed.

UCL: UCL (Land's method) is 20.6

Data used for calculation:

Result	Sample ID	Result	Sample ID	Result	Sample ID
25	039G001340	2	039G09LF48	25	039G002158
25	039G001440	50	039GGB1148	25	039G002258
460	039G001540	50	039GGB1248	25	039G001660
25	039G001640	260	039G001350	25	039G001760
25	039G001740	25	039G001450	25	039G001860
25	039G001840	110	039G001550	25	039G001960
10	039G003740	25	039G001650	25	039G002060
10	039G003840	25	039G001750	10	039G003760
10	039G003940	25	039G001850	10	039G003860
10	039G004040	25	039G001950	10	039G003960
10	039G004140	25	039G002050	10	039G004060
10	039G004240	25	039G002150	10	039G004160
10	039G004540	25	039G002250	10	039G004260
10	039G004640	10	039G003750	10	039G004360
10	039G004740	10	039G003850	10	039G004560
10	039G004840	10	039G003950	10	039G004660
10	039G004940	10	039G004050	10	039G004760
10	039G005040	10	039G004150	10	039G004860
10	039G005140	10	039G004250	10	039G004960
10	039G005240	10	039G004350	10	039G005060
10	039G005340	10	039G004550	10	039G005160
10	039G005440	10	039G004650	10	039G005260
10	039G005540	10	039G004750	10	039G005360
10	039G005640	10	039G004850	10	039G005460
10	039G005740	10	039G004950	10	039G005560
89.9	039G005840	10	039G005050	10	039H005660
10	039G005940	10	039G005150	10	039G005760
33.2	039G006040	10	039G005250	10	039G005860
25.4	039G006140	10	039G005350	10	039G005960
10	039G006240	10	039G005450	10	039G006060

Table 8-19B
95% UCL Concentration in Fluvial Deposits Groundwater
All Acetone Data
Assembly F: SWMU 39
NSA Mid-South, Millington, TN

Number of samples		Uncensored values	
Uncensored	152	Mean	20.55
Censored		Lognormal mean	17.91
Detection limit or PQL		Std. devn.	43.622789
Method detection limit		Median	10
TOTAL	152	Min.	1
		Max.	460

Lognormal distribution?		Normal distribution?	
r-squared is:	0.821	r-squared is:	0.263

Recommendations: Lognormal distribution assumed.

UCL: UCL (Land's method) is 20.6

Data used for calculation:

Result	Sample ID	Result	Sample ID	Result	Sample ID
10	039G006340	10	039G005550	10	039G006160
30.2	039G006440	10	039G005650	10	039G006260
10	039G006540	10	039G005750	10	039G006360
10	039G006640	71.2	039G005850	10	039G006460
10	039G006740	10	039G005950	10	039G006560
10	039G006840	10	039G006050	10	039G006660
10	039G034A40	10	039G006150	10	039G006760
25	039G001943	10	039G006250	10	039G006860
25	039G002043	10	039G006350	25	039GA4LF60
10	039G002143	38.5	039G006450	25	039GA4LF60
25	039G002243	24.4	039G006550	3	039G04LF61
4	039G03LF43	10	039G006650	3	039G09LF62
6	039G05LF43	10	039G006750	2	039G04LF69
50	039GGB0343	10	039G006850	10	039G006870
8	039GGB0443	2.5	039G02LF50	3	039G02LF71
50	039GGB0543	25	039GA5LF50	2	039G09LF71
5	039G010044	25	039GA9LF50	5	039G03LF73
1	039G04LF47	25	039G001455	10	039G006880
50	039GGB0147	25	039G001557	6	039G02LF85
50	039GGB0247	2	039G04LF57	7	039G08LF91
				2	039G09LF91
				2	039G03LF99

Table 8-19C
95% UCL Concentration in Fluvial Deposits Groundwater
Trichloroethene Detections Only
Assembly F: SWMU 39
NSA Mid-South, Millington, TN

Number of samples		Uncensored values	
Uncensored	19	Mean	48.64
Censored		Lognormal mean	83.74
Detection limit or PQL		Std. devn.	42.26767
Method detection limit		Median	55
TOTAL	19	Min.	1.2
		Max.	160

Lognormal distribution?		Normal distribution?	-
r-squared is:	0.850	r-squared is:	0.478

Recommendations: Lognormal distribution assumed.
-

UCL: UCL (Land's method) is 327.8

Data used for calculation:

Result	Sample ID
8.21	039G005040
2.01	039G005940
67	039G03LF43
50	039G04LF47
91.3	039G004150
160	039G004550
73	039G04LF57
1.35	039G004160
55	039GA4LF60
80	039GA4LF60
73	039G04LF61
83	039G04LF69
57	039G03LF73
66	039G03LF99
11	039G002640
37	039G003340
5	039GGB0443
3	039G003250
1.2	039G004050

Table 8-19D
95% UCL Concentration in Fluvial Deposits Groundwater
All Trichloroethene Data
Assembly F: SWMU 39
NSA Mid-South, Millington, TN

Number of samples		Uncensored values	
Uncensored	207	Mean	5.57
Censored		Lognormal mean	2.67
Detection limit or PQL		Std. devn.	18.584488
Method detection limit		Median	1
TOTAL	207	Min.	0.5
		Max.	160

Lognormal distribution?		Normal distribution?	
r-squared is:	0.723	r-squared is:	0.279

Recommendations: Lognormal distribution assumed.

UCL: UCL (Land's method) is 3.26

Data used for calculation:

Result	Sample ID	Result	Sample ID	Result	Sample ID
2.5	039G001340	1.5	039G09LF48	1.5	039G01LF58
2.5	039G001440	2.5	039GGB1148	2.5	039G001660
2.5	039G001540	2.5	039GGB1248	2.5	039G001760
2.5	039G001640	2.5	039G001350	2.5	039G001860
2.5	039G001740	2.5	039G001450	2.5	039G001960
2.5	039G001840	2.5	039G001550	2.5	039G002060
1	039G002340	2.5	039G001650	1	039G002360
1	039G002440	2.5	039G001750	1	039G002460
1	039G002540	2.5	039G001850	1	039G002560
11	039G002640	2.5	039G001950	1	039G002660
1	039G002740	2.5	039G002050	1	039G002760
1	039G002840	2.5	039G002150	1	039G002860
1	039G002940	4.8	039G002250	1	039G003060
1	039G003040	1	039G002350	1	039G003160
1	039G003140	1	039G002450	1	039G003260
1	039G003240	1	039G002550	1	039G003660
37	039G003340	1	039G002650	0.5	039G003760
1	039G003440	1	039G002750	0.5	039G003860
1	039G003640	1	039G002850	0.5	039G003960
0.5	039G003740	1	039G002950	0.5	039G004060
0.5	039G003840	1	039G003050	1.35	039G004160
0.5	039G003940	1	039G003150	0.5	039G004260
0.5	039G004040	3	039G003250	0.5	039G004360
0.5	039G004140	1	039G003350	0.5	039G004560
0.5	039G004240	1	039G003450	0.5	039G004660
0.5	039G004540	1	039G003650	0.5	039G004760
0.5	039G004640	0.5	039G003750	0.5	039G004860
0.5	039G004740	0.5	039G003850	0.5	039G004960
0.5	039G004840	0.5	039G003950	0.5	039G005060
0.5	039G004940	1.2	039G004050	0.5	039G005160
8.21	039G005040	91.3	039G004150	0.5	039G005260
0.5	039G005140	0.5	039G004250	0.5	039G005360
0.5	039G005240	0.5	039G004350	0.5	039G005460
0.5	039G005340	160	039G004550	0.5	039G005560
0.5	039G005440	0.5	039G004650	0.5	039H005660

Table 8-19D
95% UCL Concentration in Fluvial Deposits Groundwater
All Trichloroethene Data
Assembly F: SWMU 39
NSA Mid-South, Millington, TN

Number of samples		Uncensored values	
Uncensored	207	Mean	5.57
Censored		Lognormal mean	2.67
Detection limit or PQL		Std. devn.	18.584488
Method detection limit		Median	1
TOTAL	207	Min.	0.5
		Max.	160

Lognormal distribution?		Normal distribution?	
r-squared is:	0.723	r-squared is:	0.279

Recommendations: Lognormal distribution assumed.

UCL: UCL (Land's method) is 3.26

Data used for calculation:

Result	Sample ID	Result	Sample ID	Result	Sample ID
0.5	039G005540	0.5	039G004750	0.5	039G005760
0.5	039G005640	0.5	039G004850	0.5	039G005860
0.5	039G005740	0.5	039G004950	0.5	039G005960
0.5	039G005840	0.5	039G005050	0.5	039G006060
2.01	039G005940	0.5	039G005150	0.5	039G006160
0.5	039G006040	0.5	039G005250	0.5	039G006260
0.5	039G006140	0.5	039G005350	0.5	039G006360
0.5	039G006240	0.5	039G005450	0.5	039G006460
0.5	039G006340	0.5	039G005550	0.5	039G006560
0.5	039G006440	0.5	039G005650	0.5	039G006660
0.5	039G006540	0.5	039G005750	0.5	039G006760
0.5	039G006640	0.5	039G005850	0.5	039G006860
0.5	039G006740	0.5	039G005950	55	039GA4LF60
0.5	039G006840	0.5	039G006050	80	039GA4LF60
0.5	039G034A40	0.5	039G006150	73	039G04LF61
2.5	039G001943	0.5	039G006250	1.5	039G09LF62
2.5	039G002043	0.5	039G006350	1.5	039G06LF67
2.5	039G002143	0.5	039G006450	1.5	039G01LF69
2.5	039G002243	0.5	039G006550	83	039G04LF69
1.5	039G02LF43	0.5	039G006650	0.5	039G006870
67	039G03LF43	0.5	039G006750	1.5	039G07LF70
1.5	039G05LF43	0.5	039G006850	1.5	039G02LF71
1.5	039G06LF43	1.5	039G02LF50	1.5	039G09LF71
1.5	039G07LF43	1.5	039G05LF50	57	039G03LF73
5	039GGB0343	2.5	039GA5LF50	1.5	039G05LF73
5	039GGB0443	2.5	039GA9LF50	1.5	039G08LF73
5	039GGB0543	1.5	039G08LF53	0.5	039G006880
1	039G003544	2.5	039G001455	1.5	039G02LF85
5	039G010044	1	039G003555	1.5	039G07LF87
1.5	039G08LF45	1.5	039G06LF56	1.5	039G05LF90
50	039G04LF47	1.5	039G07LF56	1.5	039G08LF91
5	039GGB0147	2.5	039G001557	1.5	039G09LF91
5	039GGB0247	73	039G04LF57	66	039G03LF99
1.5	039G01LF48	2.5	039G002158		
		2.5	039G002258		

Table 8-20
Statistical Data for COPCs
Assembly F
NSA Mid-South, Millington, TN

SWMU	Medium	Chemical	n	Mean	Maximum Concentration	95%UCL of Arithmetic Meana	Selected EPC	Data Distribution	Units
SWMU 17	Groundwater	1,2-Dichloropropane	1	28	28	NA	28	Insufficient data to determinea	µg/kg
		Benzene	1	1.1	1.1	NA	1.1	Insufficient data to determine	µg/kg
SWMU 20	Groundwater	1,1,2-Trichloroethane	1	17	17	NA	17	Insufficient data to determine	µg/kg
		1,1-Dichloroethane	1	320	320	NA	320	Insufficient data to determine	µg/kg
		1,1-Dichloroethene	1	60.3	60.3	NA	60.3	Insufficient data to determine	µg/kg
		1,2-Dichloroethane	1	6	6	NA	6	Insufficient data to determine	µg/kg
		2-Butanone (MEK)	2	354.5	695	NA	695	Insufficient data to determine	µg/kg
		Acetone	1	230	230	NA	230	Insufficient data to determine	µg/kg
		Benzene	1	7	7	NA	7	Insufficient data to determine	µg/kg
SWMU 22	Surface Soil	Arsenic	2	17.35	22.2	NA	22.2	Insufficient data to determine	mg/kg
		BEQ	2	409	516.5	NA	516.5	Insufficient data to determine	µg/kg
		Benzo(a)anthracene	2	140	140	NA	140	Insufficient data to determine	µg/kg
		Benzo(a)pyrene	2	189	320	NA	320	Insufficient data to determine	µg/kg
		Benzo(b)fluoranthene	2	238.5	400	NA	400	Insufficient data to determine	µg/kg
		Benzo(k)fluoranthene	2	195	330	NA	330	Insufficient data to determine	µg/kg
		Chrysene	2	146.5	240	NA	240	Insufficient data to determine	µg/kg
		Dibenz(a,h)anthracene	2	110	110	NA	110	Insufficient data to determine	µg/kg
		Indeno(1,2,3-cd)pyrene	2	169	290	NA	290	Insufficient data to determine	µg/kg
SWMU 39	Surface Soil	Dieldrin	2	130	130	NA	130	Insufficient data to determine	µg/kg
	Loess	benzene	19	2	2	NA	2	Insufficient data to determine	µg/kg
		1,2-dichloroethene(total)	16	26	26	NA	26	Insufficient data to determine	µg/kg
		ethylbenzene	19	190	260	NA	260	Insufficient data to determine	µg/kg
		trichloroethene	19	15.5	18	NA	18	Insufficient data to determine	µg/kg
	Fluvial deposits	1,2-dichloroethene (total)	4	9.25	23	NA	23	Insufficient data to determine	µg/kg
		acetone	26	46.26	460	145.01	145.01	Lognormal	µg/kg
		trichloroethene	19	48.635	160	327.8	160	Lognormal assumed	µg/kg

Notes:

SWMU = solid waste management unit
n = Number of samples
UCL = Upper confidence limit
EPC = Exposure point concentration
NA = Not applicable

a = The sample population was too small to determine the data distribution. The maximum concentration was selected as the EPC.

Table 8-21
Exposure Pathways Summary
Assembly F — NSA Mid-South, Millington, TN

Potentially Exposed Population	Medium and Exposure Pathway	Pathway Selected for Evaluation?	Reason for Selection or Exclusion
Trespassers	Groundwater, ingestion of contaminants during potable or general use	No	No seeps, springs, or wells are present. An exposure point does not exist for this receptor.
	Groundwater, inhalation of VOCs from the groundwater	No	No seeps, springs, or wells are present. An exposure point does not exist for this receptor.
	Surface soil, incidental ingestion	Yes	It is assumed that trespassers will ingest incidental amounts of sediment.
	Surface soil, dermal contact	Yes	It is assumed that trespassers will be exposed to sediment via dermal contact.
	Sediment, incidental ingestion	Yes	It is assumed that trespassers will ingest incidental amounts of sediment.
	Sediment, dermal contact	Yes	It is assumed that trespassers will be exposed to sediment via dermal contact.
	Surface water, ingestion	No	No surface water is present.
	Surface water, dermal contact	No	No surface water is present.
Construction Worker	Groundwater, ingestion of contaminants during potable or general use	No	No seeps, springs, or wells are present. An exposure point does not exist for this receptor.
	Groundwater, inhalation of VOCs from the groundwater	No	No seeps, springs, or wells are present. An exposure point does not exist for this receptor.
	Soil, incidental ingestion	Yes	It is assumed that construction workers will ingest incidental amounts of soil.
	Soil, dermal contact	Yes	It is assumed that construction workers will be exposed to soil via dermal contact.
	Sediment, incidental ingestion	Yes	It is assumed that construction workers will ingest incidental amounts of sediment.
	Sediment, dermal contact	Yes	It is assumed that construction workers will be exposed to sediment via dermal contact.
	Surface water, ingestion	No	No surface water is present.
	Surface water, dermal contact	No	No surface water is present.

Table 8-21
Exposure Pathways Summary
Assembly F — NSA Mid-South, Millington, TN

Potentially Exposed Population	Medium and Exposure Pathway	Pathway Selected for Evaluation?	Reason for Selection or Exclusion
Adult Worker	Groundwater, ingestion of contaminants during potable or general use	Yes	In accordance with TDEC, groundwater beneath the Assembly F SWMUs is assumed to be a potential drinking water source.
	Groundwater, inhalation of VOCs from the groundwater	Yes	In accordance with TDEC, groundwater beneath the Assembly F SWMUs is assumed to be a potential drinking water source.
	Surface soil, incidental ingestion	Yes	It is assumed that adult workers will ingest incidental amounts of soil.
	Surface soil, dermal contact	Yes	It is assumed that adult workers will be exposed to soil via dermal contact.
	Sediment, incidental ingestion	Yes	It is assumed that adult workers will ingest incidental amounts of sediment.
	Sediment, dermal contact	Yes	It is assumed that adult workers will be exposed to sediment via dermal contact.
	Surface water, ingestion	No	No surface water is present.
	Surface water, dermal contact	No	No surface water is present.
Residents	Groundwater, ingestion of contaminants during potable or general use	Yes	In accordance with TDEC, groundwater underlying Assembly F SWMUs is assumed to be a potential drinking water source.
	Groundwater, inhalation of VOCs from the groundwater	Yes	In accordance with TDEC, groundwater underlying Assembly F SWMUs is assumed to be a potential drinking water source.
	Soil, incidental ingestion	Yes	It is assumed that residents will ingest incidental amounts of soil.
	Soil, dermal contact	Yes	It is assumed that residents will be exposed to soil via dermal contact.
	Sediment, incidental ingestion	No	It is assumed that residents will ingest incidental amounts of sediment.
	Sediment, dermal contact	No	It is assumed that residents will be exposed to sediment via dermal contact.
	Surface water, ingestion	No	No surface water is present.
	Surface water, dermal contact	No	No surface water is present.

Table 8-22
Parameters Used to Estimate CDI
Assembly F — NSA Mid-South, Millington, TN

Pathway Parameters	Resident Adult	Resident Child	Trespassing Adolescent (age 7-16)	Construction Worker	Adult Worker	Units
Soil Pathways						
Ingestion Rate (soil/sediment) (IR_s)	100[a]	200[a]	100[a]	200[b]	50[a]	mg/day
Ingestion Rate (groundwater) (IR_w)	2[a]	1[a]	NA	1	1	L/day
Skin Surface Area (SSA)	4,100[a]	2,900	4,100[a]	4,100[a]	4,100[a]	cm^2/event
Soil to Skin Adherence Factor (ADH)	1	1	1	1	1	unitless
Absorption Factor[c] (ABS)			0.01 (organics) 0.001 (inorganics)			unitless
Oral Absorption Efficiency[c] (OAE)			0.2 (inorganics) 0.8 (VOCs) 0.5 (others)			unitless
Exposure Frequency (EF)	350[d]	350[d]	52[e]	120[b]	9[d]	days/year
Exposure Duration (ED)	24[f]	6[f]	10[g]	3[b]	25[f]	years
Conversion Factor (C)			1E-6			kg/mg
Body Weight (BW)	70[a]	15[a]	45[a]	70[a]	70[a]	kg
Averaging Time, Noncancer (AT_n)	8,760[h]	2,190[h]	3,650[h]	1095[h]	9125[h]	days
Averaging Time, Cancer	25,550	25,550	25,550	25,550	25,550	days
Groundwater Pathways						
Ingestion Rate (IR_w)	2[c]	1[c]	NA	NA	NA	L/day
Exposure Frequency (EF)	350[f]	350[f]	NA	NA	NA	days/year
Event Frequency (EV)	1[j]	1[j]	NA	NA	NA	events/day
Exposure Duration (ED)	24[g]	6[g]	NA	NA	NA	years
Skin Surface Area (SSA)	4,100[b]	2,900[b]	NA	NA	NA	cm^2/event
Dermal Absorbed Dose (DA_{event})[k]	calculated		NA	NA	NA	mg/cm^2-event
Permeability Constant (K_p)[k]	chemical-specific		NA	NA	NA	cm/hr
Exposure Time (t_{event})[k]	0.167	0.167	NA	NA	NA	hours/event
Partitioning Coefficient (B)[k]	chemical-specific		NA	NA	NA	unitless
Lag Time (t)[k]	chemical-specific		NA	NA	NA	hours

Notes:

a = *Risk Assessment Guidance for Superfund Vol. I, Human Health Evaluation Manual (Part A) (USEPA, 1989a).*
b = Construction worker IR, EF, and ED values recommended by TDEC, USEPA Region 4, and Navy April 1997 (USEPA, 1995).
c = *Exposure Factors Handbook* (USEPA, 1997).
d = Conservative assumption.
e = *Supplemental Guidance to RAGS Bulletins 2 and 3, Exposure Assessment and Toxicity Assessment* (USEPA, 1995).
f = *Risk Assessment Guidance for Superfund Vol. I: Human Health Evaluation Manual Supplemental Guidance, Standard Default Exposure Factors, Interim Final*, OSWER Directive: 9285.6-3.EPA/600/8-89/043 (USEPA, 1991b).
g = *Risk Assessment Guidance for Superfund: Vol. I — Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals)*, OSWER Directive 9285.7-01B *USEPA (1991a).*
h = Calculated as the product of ED (years) x 365 days/year.
i = Calculated as the product of 70 years (assumed lifetime) x 365 days per year.
j = *Supplemental Dermal Guidance* (USEPA, 1998).
k = *Principles of Dermal Exposure Assessment* (USEPA, 1992).

Table 8-23
Intake Multiplier Calculations
Adult Worker Exposure Scenario
Incidental Ingestion of Chemicals - Soil Pathway
Assembly F
NSA Mid-South, Millington, TN

EQUATION	IM_{oral}	= [	IR	×	CF	×	FI	×	EF	×	ED	] ÷ [	BW	×	AT	]
UNITS	mg/kg-day		mg/day		kg/mg		unitless		days/year		years		kg		days	
NONCARCINOGENIC EFFECTS																
All Chemicals	1.76E-08	= [	50	×	1E-06	×	1	×	9	×	25	] ÷ [	70	×	9,125	]
CARCINOGENIC EFFECTS																
All Chemicals	6.29E-09	= [	50	×	1E-06	×	1	×	9	×	25	] ÷ [	70	×	25,550	]

Notes:

See Table 9-22 for definitions and sources of equation variables identified as follows:

IM_{oral} = daily oral intake
IR = ingestion rate
CF = unit conversion factor
FI = fraction ingested from contaminated source
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Table 8-24
Intake Multiplier Calculations
Adult Worker Exposure Scenario
Dermal Contact with Chemicals - Soil Pathway
Assembly F
NSA Mid-South, Millington, TN

EQUATION	IM_{dermal}	=	[(	FI	×	CF	×	SA	×	AF	×	ABS	×	EF	×	ED	] ÷	[	BW	×	AT	]
UNITS	mg/kg-day			unitless		kg/mg		cm^2/event		mg/cm^2		unitless		events/year		years			kg		days	
NONCARCINOGENIC EFFECTS																						
Metals	1.44E-09	=	[(	1	×	1E-06	×	4,100	×	1	×	0.001	×	9	×	25	] ÷	[	70	×	9,125	]
Organics	1.44E-08	=	[(	1	×	1E-06	×	4,100	×	1	×	0.01	×	9	×	25	] ÷	[	70	×	9,125	]
CARCINOGENIC EFFECTS																						
Metals	5.16E-10	=	[(	1	×	1E-06	×	4,100	×	1	×	0.001	×	9	×	25	] ÷	[	70	×	25,550	]
Organics	5.16E-09	=	[(	1	×	1E-06	×	4,100	×	1	×	0.01	×	9	×	25	] ÷	[	70	×	25,550	]

Notes:

See Table 9-22 for definitions and sources of equation variables identified as follows:

IM_{dermal} = absorbed dose
FI = fraction of intake
CF = unit conversion factor
SA = skin surface area available for contact
AF = soil-to-skin adherence factor
ABS = absorption factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Table 8-25
Intake Multiplier Calculations
Construction Worker Exposure Scenario
Incidental Ingestion of Chemicals - Soil Pathway
Assembly F
NSA Mid-South, Millington, TN

EQUATION	IM_{oral}	=	[	IR	×	CF	×	FI	×	EF	×	ED	]	÷	[	BW	×	AT	]
UNITS	mg/kg-day			mg/day		kg/mg		unitless		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																			
INORGANICS																			
All Chemicals	9.39E-07	=	[	200	×	1E-06	×	1	×	120	×	3	]	÷	[	70	×	1,095	]
CARCINOGENIC EFFECTS																			
All Chemicals	4.03E-08	=	[	200	×	1E-06	×	1	×	120	×	3	]	÷	[	70	×	25,550	]

Notes:

See Table 9-22 for definitions and sources of equation variables identified as follows:

IM_{oral} = daily oral intake
IR = ingestion rate
CF = unit conversion factor
FI = fraction ingested from contaminated source
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Table 8-26
Intake Multiplier Calculations
Construction Worker Exposure Scenario
Dermal Contact with Chemicals - Soil Pathway
Assembly F
NSA Mid-South, Millington, TN

EQUATION	IM_{dermal}	=	[	FI	×	CF	×	SA	×	AF	×	ABS	×	EF	×	ED	]	÷	[	BW	×	AT	]
UNITS	mg/kg-day			unitless		kg/mg		cm^2/event		mg/cm^2		unitless		events/year		years				kg		days	
NONCARCINOGENIC EFFECTS																							
Metals	1.93E-08	=	[	1	×	1E-06	×	4,100	×	1	×	0.001	×	120	×	3	]	÷	[	70	×	1,095	]
Organics	1.93E-07	=	[	1	×	1E-06	×	4,100	×	1	×	0.01	×	120	×	3	]	÷	[	70	×	1,095	]
CARCINOGENIC EFFECTS																							
Metals	8.25E-10	=	[	1	×	1E-06	×	4,100	×	1	×	0.001	×	120	×	3	]	÷	[	70	×	25,550	]
Organics	8.25E-09	=	[	1	×	1E-06	×	4,100	×	1	×	0.01	×	120	×	3	]	÷	[	70	×	25,550	]

Notes:

See Table 9-22 for definitions and sources of equation variables identified as follows:

IM_{dermal} = absorbed dose
FI = fraction of intake
CF = unit conversion factor
SA = skin surface area available for contact
AF = soil-to-skin adherence factor
ABS = absorption factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Table 8-27
Intake Multiplier Calculations
Trespasser Exposure Scenario
Incidental Ingestion of Chemicals - Soil Pathway
Assembly F
NSA Mid-South, Millington, TN

EQUATION	IM_{oral}	= [	IR	×	CF	×	FI	×	EF	×	ED	] ÷ [	BW	×	AT	]
UNITS	mg/kg-day		mg/day		kg/mg		unitless		days/year		years		kg		days	
NONCARCINOGENIC EFFECTS																
All Chemicals	3.17E-07	= [	100	×	1E-06	×	1	×	52	×	10	] ÷ [	45	×	3,650	]
CARCINOGENIC EFFECTS																
All Chemicals	4.52E-08	= [	100	×	1E-06	×	1	×	52	×	10	] ÷ [	45	×	25,550	]

Notes:

See Table 9-22 for definitions and sources of equation variables identified as follows:

IM_{oral} = daily oral intake
IR = ingestion rate
CF = unit conversion factor
FI = fraction ingested from contaminated source
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Table 8-28
Intake Multiplier Calculations
Trespasser Exposure Scenario
Dermal Contact with Chemicals - Soil Pathway
Assembly F
NSA Mid-South, Millington, TN

EQUATION UNITS	IM_{dermal} mg/kg-day	=	[	FI unitless	×	CF kg/mg	×	SA cm^2/event	×	AF mg/cm^2	×	ABS unitless	×	EF events/year	×	ED years	]	÷	[	BW kg	×	AT days	]
NONCARCINOGENIC EFFECTS																							
Metals	1.30E-08	=	[	1	×	1E-06	×	4,100	×	1	×	0.001	×	52	×	10	]	÷	[	45	×	3,650	]
Organics	1.30E-07	=	[	1	×	1E-06	×	4,100	×	1	×	0.01	×	52	×	10	]	÷	[	45	×	3,650	]
CARCINOGENIC EFFECTS																							
Metals	1.85E-09	=	[	1	×	1E-06	×	4,100	×	1	×	0.001	×	52	×	10	]	÷	[	45	×	25,550	]
Organics	1.85E-08	=	[	1	×	1E-06	×	4,100	×	1	×	0.01	×	52	×	10	]	÷	[	45	×	25,550	]

Notes:

See Table 9-22 for definitions and sources of equation variables identified as follows:

IM_{dermal} = absorbed dose
FI = fraction of intake
CF = unit conversion factor
SA = skin surface area available for contact
AF = soil-to-skin adherence factor
ABS = absorption factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time
BE = benzo(a)pyrene equivalent concentration

Table 8-29
Ingestion-Specific Intake Multiplier
Residential Child Exposure: Ingestion of Chemicals in Soil and Dust
Assembly F
NSA Mid-South, Millington, TN

EQUATION	**IM oral**	**=**	**[**	**IR**	**×**	**EF**	**×**	**ED**	**×**	**FI**	**×**	**CF**	**]**	**÷**	**[**	**BW**	**×**	**AT**	**]**
UNITS	**kg/kg-day**			**mg/day**		**days/yr**		**yr**		**unitless**		**kg/mg**				**kg**		**days**	
NONCARCINOGENIC EFFECTS																			
All COPCs	1.28E-05	=	[	200	×	350	×	6	×	1	×	1E-06	]	÷	[	15	×	2,190	]

Notes:

See Table 9-22 for definitions and sources of equation variables identified as follows:

IM_{oral} = intake multiplier
IR = ingestion rate
EF = exposure frequency
ED = exposure duration
CF = conversion factor
AT = averaging time
BW = body weight
FI = fraction ingested

Table 8-30
Dermal-Specific Intake Multiplier
Residential Child Exposure: Dermal Contact with Chemicals in Soil
Assembly F
NSA Mid-South, Millington, TN

EQUATION	**IM derm**	**=**	**[**	**SA**	**×**	**AF**	**×**	**ABS**	**×**	**EF**	**×**	**ED**	**×**	**CF**	**]**	**÷**	**[**	**BW**	**×**	**AT**	**]**
UNITS	**kg/kg-day**			**cm²/event**		**mg/cm²**		**unitless**		**events/year**		**years**		**kg/mg**				**kg**		**days**	
NONCARCINOGENIC EFFECTS																					
Metals	1.85E-07	=	[	2900	×	1	×	0.001	×	350	×	6	×	1E-06	]	÷	[	15	×	2,190	]
Organics	1.85E-06	=	[	2900	×	1	×	0.01	×	350	×	6	×	1E-06	]	÷	[	15	×	2,190	]

Notes:

See Table 9-22 for definitions and sources of equation variables identified as follows:

IM_{derm} = intake multiplier
CF = conversion factor
SA = skin surface area available for contact
AF = soil-to-skin adherence factor
ABS = absorption factor
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Table 8-31
Ingestion-Specific Intake Multiplier
Lifetime-Weighted Average Exposure: Ingestion of Soil Pathway
Assembly F
NSA Mid-South, Millington, TN

EQUATION	IM oral	=	{[(	IRc	×	EDc	)÷(	BWc	)]+[(	IRa	×	EDa	)÷(	BWa	)]}	×	{[(	EF	×	CF	)]	÷	[	AT	]}
UNITS	kg/kg-day			mg/day		yr		kg		mg/day		yr		kg				years		kg/mg				days	
CARCINOGENIC EFFECTS																									
All COPCs	1.57E-06	=	{[(	200	×	6	)÷(	15	)]+[(	100	×	24	)÷(	70	)]}	×	{[(	350	×	1E-06	)]	÷	[	25,550	]}

Notes:

See Table 9-22 for definitions and sources of equation variables identified as follows:

IMoral = intake multiplier
IRc = ingestion rate - child
EDc = exposure duration - child
BWc = body weight - child
IRa = ingestion rate - adult
EDa = exposure duration - adult

EF = exposure frequency
CF = conversion factor
BW = body weight
AT = averaging time

Table 8-32
Dermal-Specific Intake Multiplier
Lifetime-Weighted Average Exposure: Dermal Contact with Chemicals in Soil
Assembly F
NSA Mid-South, Millington, TN

EQUATION	IM derm	=	[(	CF	×	EF	×	AF	×	ABS	)÷(	AT	)] × [(	EDc	×	SAc	)÷(	BWc	)÷(	EDa	×	SAa	)÷(	BWa	)]
UNITS	kg/kg-day			kg/mg		days/yr		mg/cm^2-event		unitless		days		years		cm^2		kg		years		cm^2		kg	
CARCINOGENIC EFFECTS																									
Metals	3.51E-08	=	[(	1E-06	×	350	×	1	×	0.001	)÷(	25550	)] × [(	6	×	2900	)÷(	15	)÷(	24	×	4100	)÷(	70	)]
Organics	3.51E-07	=	[(	1E-06	×	350	×	1	×	0.01	)÷(	25550	)] × [(	6	×	2900	)÷(	15	)÷(	24	×	4100	)÷(	70	)]

Notes:

See Table 9-22 for definitions and sources of equation variables identified as follows:

IMderm = intake multiplier
CF = conversion factor
SAc = skin surface area available for contact - child
SAa = skin surface area available for contact - adult
AF = soil-to-skin adherence factor
AT = averaging time
ABS = absorption factor
EF = exposure frequency
EDc = exposure duration - child
EDa = exposure duration - adult
BWc = body weight - child
BWa = body weight - adult

Table 8-33
Ingestion-Specific Intake Multiplier
Residential Child Exposure: Ingestion of Chemicals in Water
Assembly F
NSA Mid-South, Millington, TN

EQUATION	**IM oral**	**=**	**[**	**IR**	**×**	**EF**	**×**	**ED_l**	**]**	**÷**	**[**	**BW**	**×**	**AT**	**]**
UNITS	**L/kg-day**			**L/day**		**days/yr**		**yr**				**kg**		**days**	
NONCARCINOGENIC EFFECTS															
All COPCs	6.39E-02	=	[	1	×	350	×	6	]	÷	[	15	×	2,190	]

Notes:

See Table 9-22 for definitions and sources of equation variables identified as follows:

IM_{oral} = intake multiplier
IR = ingestion rate
EF = exposure frequency
ED = exposure duration
AT = averaging time
BW = body weight

Table 8-34
Calculation of Dermally Absorbed Dose in Water
Assembly F
NSA Mid-South, Millington, TN

EQUATION	DA_{event}	=	K_p	×	{	[	t_{event}	÷	(	1	+	B	)	]	+	[	2	×	τ	×	(	1	+	(	3	×	B	)	)	÷	(	1	+	B	)	]	}
UNITS	mg/cm^2 - event		cm/hr				hours/event					unitless							hour								unitless							unitless			
VOCs																																				
Acetone	5.58E-05	=	5.70E-04	×	{	[	0.166667	÷	(	1	+	7.0E-01	)	]	+	[	2	×	8.4E-07	×	(	1	+	(	3	×	5.8E-05	)	)	÷	(	1	+	5.8E-05	)	]	}
Benzene	1.47E-02	=	2.10E-02	×	{	[	0.166667	÷	(	1	+	1.3E-02	)	]	+	[	2	×	2.6E-01	×	(	1	+	(	3	×	1.3E-02	)	)	÷	(	1	+	1.3E-02	)	]	}
1,1-Dichloroethane	7.78E-03	=	8.90E-03	×	{	[	0.166667	÷	(	1	+	6.2E-03	)	]	+	[	2	×	3.5E-01	×	(	1	+	(	3	×	6.2E-03	)	)	÷	(	1	+	6.2E-03	)	]	}
1,1-Dichloroethene	1.38E-02	=	1.60E-02	×	{	[	0.166667	÷	(	1	+	1.3E-02	)	]	+	[	2	×	3.4E-01	×	(	1	+	(	3	×	1.3E-02	)	)	÷	(	1	+	1.3E-02	)	]	}
1,2-Dichloroethane	4.61E-03	=	5.30E-03	×	{	[	0.166667	÷	(	1	+	3.0E-03	)	]	+	[	2	×	3.5E-01	×	(	1	+	(	3	×	3.0E-03	)	)	÷	(	1	+	3.0E-03	)	]	}
1,2-Dichloroethene (Total)	8.55E-03	=	1.00E-02	×	{	[	0.166667	÷	(	1	+	7.2E-03	)	]	+	[	2	×	3.4E-01	×	(	1	+	(	3	×	7.2E-03	)	)	÷	(	1	+	7.2E-03	)	]	}
1,2-Dichloropropane	1.04E-02	=	1.00E-02	×	{	[	0.166667	÷	(	1	+	1.0E-02	)	]	+	[	2	×	4.3E-01	×	(	1	+	(	3	×	1.0E-02	)	)	÷	(	1	+	1.0E-02	)	]	}
Ethylbenzene	8.27E-02	=	7.40E-02	×	{	[	0.166667	÷	(	1	+	1.4E-01	)	]	+	[	2	×	3.9E-01	×	(	1	+	(	3	×	1.4E-01	)	)	÷	(	1	+	1.4E-01	)	]	}
Methyl ethyl ketone (2-Butanone)	7.11E-04	=	1.10E-03	×	{	[	0.166667	÷	(	1	+	1.9E-04	)	]	+	[	2	×	2.4E-01	×	(	1	+	(	3	×	1.9E-04	)	)	÷	(	1	+	1.9E-04	)	]	}
1,1,2-Trichloroethane	1.12E-02	=	8.40E-03	×	{	[	0.166667	÷	(	1	+	1.1E-02	)	]	+	[	2	×	5.7E-01	×	(	1	+	(	3	×	1.1E-02	)	)	÷	(	1	+	1.1E-02	)	]	}
Trichloroethene	2.11E-02	=	1.60E-02	×	{	[	0.166667	÷	(	1	+	2.6E-02	)	]	+	[	2	×	5.5E-01	×	(	1	+	(	3	×	2.6E-02	)	)	÷	(	1	+	2.6E-02	)	]	}

Notes:

K_p = permeability constant (taken from Table 5-7 of USEPA, 1992)

t_{event} = duration of event (taken from USEPA, 1992)

B = partitioning property of constituent (taken form Table 5-8, USEPA, 1992)

τ = lag time (taken form Table 5-8, USEPA, 1992)

Table 8-35
Dermal-Specific Intake Multiplier
Residential Child Exposure: Dermal Contact with Chemicals in Water
Assembly F
NSA Mid-South, Millington, TN

EQUATION	IM derm	=	[	DA_{event}	×	SA	×	EV	×	EF	×	ED	]	÷	[	BW	×	AT	]
UNITS	kg/kg-day			mg/cm^2-event		cm^2/event		events/day		days/year		years				kg		days	
NONCARCINOGENIC EFFECTS																			
VOCs																			
Acetone	1.03E-02	=	[	5.58E-05	×	2900	×	1	×	350	×	6	]	÷	[	15	×	2,190	]
Benzene	2.72E+00	=	[	1.47E-02	×	2900	×	1	×	350	×	6	]	÷	[	15	×	2,190	]
1,1-Dichloroethane	1.44E+00	=	[	7.78E-03	×	2900	×	1	×	350	×	6	]	÷	[	15	×	2,190	]
1,1-Dichloroethene	2.56E+00	=	[	1.38E-02	×	2900	×	1	×	350	×	6	]	÷	[	15	×	2,190	]
1,2-Dichloroethane	8.55E-01	=	[	4.61E-03	×	2900	×	1	×	350	×	6	]	÷	[	15	×	2,190	]
1,2-Dichloroethene (Total)	1.59E+00	=	[	8.55E-03	×	2900	×	1	×	350	×	6	]	÷	[	15	×	2,190	]
1,2-Dichloropropane	1.93E+00	=	[	1.04E-02	×	2900	×	1	×	350	×	6	]	÷	[	15	×	2,190	]
Ethylbenzene	1.53E+01	=	[	8.27E-02	×	2900	×	1	×	350	×	6	]	÷	[	15	×	2,190	]
Methyl ethyl ketone (2-Butanone)	1.32E-01	=	[	7.11E-04	×	2900	×	1	×	350	×	6	]	÷	[	15	×	2,190	]
1,1,2-Trichloroethane	2.07E+00	=	[	1.12E-02	×	2900	×	1	×	350	×	6	]	÷	[	15	×	2,190	]
Trichloroethene	3.91E+00	=	[	2.11E-02	×	2900	×	1	×	350	×	6	]	÷	[	15	×	2,190	]

Notes:

See Table 9-34 for DA_{event} calculation and Table 9-22 for definitions and sources of equation variables identified as follows:

IM_{derm} = intake multiplier
DA_{event} = dose absorbed per unit area per event
SA = skin surface area available for contact
EV = event frequency
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time

Table 8-36
Ingestion-Specific Intake Multiplier
Lifetime-Weighted Average Exposure: Ingestion of Water Pathway
Assembly F
NSA Mid-South, Millington, TN

EQUATION	**IM oral**	=	{[(	**IRc**	×	**EDc**	)÷(	**BWc**	)]+[(	**IRa**	×	**EDa**	)÷(	**BWa**	)]}	×	(	**EF**	÷	**AT**	)
UNITS	**kg/kg-day**			**L/day**		**yr**		**kg**		**L/day**		**yr**		**kg**				**years**		**days**	
CARCINOGENIC EFFECTS																					
All COPCs	1.57E-02	=	{[(	2	×	6	)÷(	15	)]+[(	1	×	24	)÷(	70	)]}	×	(	350	÷	25,550	)

Notes:

See Table 9-22 for definitions and sources of equation variables identified as follows:

IMoral = intake multiplier
IRc = ingestion rate - child
EDc = exposure duration - child
BWc = body weight - child
IRa = ingestion rate - adult
EDa = exposure duration - adult
BWa = body wieght - adult
EF = exposure frequency
AT = averaging time

Table 8-37
Dermal-Specific Intake Multiplier
Lifetime-Weighted Average Exposure: Dermal Contact with Chemicals in Water
Assembly F
NSA Mid-South, Millington, TN

EQUATION	IM derm	=	[	EDc	×	SAc	)÷(	BWc	)+(	EDa	×	SAa	)÷(	BWa	)]	×	[	(	EV	×	DA_{event}	)	÷	AT	]
UNITS	kg/kg-day			years		cm^2		kg		years		cm^2		kg					events/day		mg/cm^2-event			days	
VOCs																									
Acetone	5.60E-06	=	[	6	×	2900	)÷(	15	)+(	24	×	4100	)÷(	70	)]	×	[	(	1	×	5.58E-05	)	÷	25,550	]
Benzene	1.47E-03	=	[	6	×	2900	)÷(	15	)+(	24	×	4100	)÷(	70	)]	×	[	(	1	×	1.47E-02	)	÷	25,550	]
1,1-Dichloroethane	7.81E-04	=	[	6	×	2900	)÷(	15	)+(	24	×	4100	)÷(	70	)]	×	[	(	1	×	7.78E-03	)	÷	25,550	]
1,1-Dichloroethene	1.38E-03	=	[	6	×	2900	)÷(	15	)+(	24	×	4100	)÷(	70	)]	×	[	(	1	×	1.38E-02	)	÷	25,550	]
1,2-Dichloroethane	4.63E-04	=	[	6	×	2900	)÷(	15	)+(	24	×	4100	)÷(	70	)]	×	[	(	1	×	4.61E-03	)	÷	25,550	]
1,2-Dichloroethene (Total)	8.59E-04	=	[	6	×	2900	)÷(	15	)+(	24	×	4100	)÷(	70	)]	×	[	(	1	×	8.55E-03	)	÷	25,550	]
1,2-Dichloropropane	1.05E-03	=	[	6	×	2900	)÷(	15	)+(	24	×	4100	)÷(	70	)]	×	[	(	1	×	1.04E-02	)	÷	25,550	]
Ethylbenzene	8.31E-03	=	[	6	×	2900	)÷(	15	)+(	24	×	4100	)÷(	70	)]	×	[	(	1	×	8.27E-02	)	÷	25,550	]
Methyl ethyl ketone (2-Butanone)	7.14E-05	=	[	6	×	2900	)÷(	15	)+(	24	×	4100	)÷(	70	)]	×	[	(	1	×	7.11E-04	)	÷	25,550	]
1,1,2-Trichloroethane	1.12E-03	=	[	6	×	2900	)÷(	15	)+(	24	×	4100	)÷(	70	)]	×	[	(	1	×	1.12E-02	)	+	25,550	]
Trichloroethene	2.12E-03	=	[	6	×	2900	)÷(	15	)+(	24	×	4100	)÷(	70	)]	×	[	(	1	×	2.11E-02	)	÷	25,550	]

Notes:

See Table 9-34 for DA_{event} calculation and Table 9-22 for definitions and sources of equation variables identified as follows:

IM_{derm} = intake multiplier
EDc = exposure duration - child
SAc = skin surface area available for contact - child
BWc = body weight - child
EDa = exposure duration - adult
SAa = skin surface area available for contact - adult
BWa = body weight - adult
DA_{event} = dose absorbed per unit area per event
EV = event frequency
AT = averaging time

Table 8-38
Soil and Groundwater Intake Multiplier Summary
Assembly F
NSA Mid-South, Millington, TN

Exposure Scenario	Media	Exposure Pathway	C/NC	Chemical	Intake Multiplier
Adult Worker	Soil	Ingestion	NC	All Chemicals	1.76E-08
			C	All Chemicals	6.29E-09
	Soil	Dermal Contact	NC	Metals	1.44E-09
				Organics	1.44E-08
			C	Metals	5.16E-10
				Organics	5.16E-09
Construction Worker	Soil	Ingestion	NC	All Chemicals	9.39E-07
			C	All Chemicals	4.03E-08
	Soil	Dermal Contact	NC	Metals	1.93E-08
				Organics	1.93E-07
			C	Metals	8.25E-10
				Organics	8.25E-09
Trespasser	Soil/Sediment	Ingestion	NC	All Chemicals	3.17E-07
			C	All Chemicals	4.52E-08
	Soil/Sediment	Dermal Contact	NC	Metals	1.30E-08
				Organics	1.30E-07
			C	Metals	1.85E-09
				Organics	1.85E-08
Residential Child	Soil	Ingestion	NC	All Chemicals	1.28E-05
		Dermal Contact	NC	Metals	1.85E-07
				Organics	1.85E-06
Residential - LWA	Soil	Ingestion	C	All Chemicals	1.57E-06
Residential - LWA		Dermal Contact	C	Metals	3.51E-08
				Organics	3.51E-07
Residential Child	Water	Ingestion	NC	All Chemicals	6.39E-02
	Water	Dermal Contact	NC	Acetone	1.03E-02
				Benzene	2.72E+00
				1,1-Dichloroethane	1.44E+00
				1,1-Dichloroethene	2.56E+00
				1,2-Dichloroethane	8.55E-01
				1,2-Dichloroethene (Total)	1.59E+00
				1,2-Dichloropropane	1.93E+00
				Ethylbenzene	1.53E+01
				Methyl ethyl ketone (2-Butanone)	1.32E-01
				1,1,2-Trichloroethane	2.07E+00
				Trichloroethene	3.91E+00
Residential - LWA	Water	Ingestion	C	All Chemicals	1.57E-02
	Water	Dermal Contact	C	Acetone	5.60E-06
				Benzene	1.47E-03
				1,1-Dichloroethane	7.81E-04
				1,1-Dichloroethene	1.38E-03
				1,2-Dichloroethane	4.63E-04
				1,2-Dichloroethene (Total)	8.59E-04
				1,2-Dichloropropane	1.05E-03
				Ethylbenzene	8.31E-03
				Methyl ethyl ketone (2-Butanone)	7.14E-05
				1,1,2-Trichloroethane	1.12E-03
				Trichloroethene	2.12E-03

Notes:
Refer to Table 9-22 for a presentation of the exposure parameter values and Tables 9-23 through 9-37 for a detailed presentation of the intake multipliers.

C/NC = carcinogenic/noncarcinogenic
LWA = lifetime-weighted average

Table 8-39A
Toxicity Assessment
Toxicity Values: Carcinogenic Effects — Oral

Chemical	Oral Slope Factor (SF) $(mg/kg\text{-}day)^{-1}$	Weight-of-Evidence Classification	Type of Cancer	SF Basis	Source
Acetone	NA	D	NA	NA	IRIS
Antimony	ND	NA	NA	NA	IRIS
Arsenic	1.50E+00	A	Skin cancer, multiple organ cancers	Drinking water	IRIS
Benzene	2.90E-02	A	Leukemia	Occupational	IRIS
Benzo(a)pyrene[1]	7.30E+00	B2	Forestomach, squamous cell papillomas and carcinomas	Diet	IRIS
2-Butanone	NA	D	NA	NA	IRIS
1,1-Dichloroethane	ND	C	NA	NA	IRIS
1,1-Dichloroethene	6.00E-01	C	Adrenal pheochromocytomas	Drinking water	IRIS
1,2-Dichloroethane	9.10E-02	B2	Hemangiosarcomas	Gavage	IRIS
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND
1,2-Dichloropropane	6.80E-02	B2	Liver tumors	Gavage	HEAST
Dieldrin	1.60E+01	B2	Liver carcinoma	Diet	IRIS
Ethylbenzene	NA	D	NA	NA	IRIS
1,1,2-Trichloroethane	5.70E-02	C	Hepatacellular carcinomas and pheochromocytomas	Gavage	IRIS
Trichloroethene	1.10E-02	B2	ND	ND	Region 3

Notes:

1 = Toxicity value used for BEQ as Benzo(a)pyrene equivalent .

HEAST = Health Effects Assessment Summary Table (USEPA, 1997).
IRIS = Integrated Risk Information System
Region 3 = Toxicity value taken from Region 3 Risk Based Concentration Table (USEPA, 1999).

ND = no data
NA = not applicable

USEPA Cancer Classification:
A = Human carcinogen
B1 = Probable human carcinogen - indicates that limited human data are available.
B2 = Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans.
C = Possible human carcinogen
D = Not classifiable as a human carcinogen

Table 8-39B
Toxicity Assessment
Toxicity Values: Noncarcinogenic — Oral

Chemical	Exposure Length	Oral RfD[1] mg/kg-day	Confidence Level	Critical Effect	RfD basis	Uncertainty Factor	Source
Acetone	Subchronic	1.00E-01	Medium	Increase liver and kidney weights and nephrotoxicity	Gavage	1000	IRIS
Antimony	Chronic	4.00E-04	NA	Whole body, altered blood chemistries	Drinking water	1000	IRIS
Arsenic	Chronic	3.00E-04	Medium	Hyperpigmentation, keratosis	Oral	3	IRIS
Benzene	Chronic	3.00E-03	NA	NA	NA	NA	Region 3
Benzo(a)pyrene	ND	ND	NA	NA	NA	NA	IRIS
2-Butanone	Subchronic	6.00E-01	Low	Decreased fetal birth weight	Drinking water	3000	IRIS
1,1-Dichloroethane	Subchronic	1	ND	None observed	Inhalation	100	HEAST
1,1-Dichloroethene	Chronic	9.00E-03	NA	Liver lesions	Drinking water	1000	HEAST
1,2-Dichloroethane	Chronic	ND	NA	NA	NA	NA	IRIS
1,2-Dichloroethene (total)	Subchronic	9.00E-03	NA	Lesions	Drinking water	1000	HEAST
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND
Dieldrin	Chronic	5.00E-05	Medium	Liver lesions	Diet	100	IRIS
Ethylbenzene	Chronic	1.00E-01	Low	Liver and kidney toxicity	Gavage	1000	IRIS
1,1,2-Trichloroethane	Chronic	4.00E-03	NA	Changes in clinical chemistries	Drinking water	1000	IRIS
Trichloroethene	ND	6.00E-03	ND	ND	ND	ND	Region 3

HEAST = Health Effects Assessment Summary Table (USEPA, 1997).
IRIS = Integrated Risk Information System
Region 3 = Toxicity value taken from Region 3 Risk Based Concentration Table (USEPA, 1999).

NA = not applicable
ND = no data available

Table 8-39C
Toxicity Assessment
Toxicity Values: Carcinogenic Effects — Dermal

Chemical	Oral Slope Factor $(mg/kg\text{-}day)^{-1}$	Oral Absorption Efficiency Factor[a]	Default Dermal Slope Factor[b] $(mg/kg\text{-}day)^{-1}$
Acetone	NA	0.8	ND
Antimony	ND	0.2	ND
Arsenic	1.5E+00	0.2	7.50E+00
Benzene	2.9E-02	0.8	3.63E-02
Benzo(a)pyrene	7.3E+00	0.5	1.46E+01
2-Butanone	NA	0.8	ND
1,1-Dichloroethane	ND	0.8	ND
1,1-Dichloroethene	6.0E-01	0.8	7.50E-01
1,2-Dichloroethane	9.1E-02	0.8	1.14E-01
1,2-Dichloroethene (total)	ND	0.8	ND
1,2-Dichloropropane	6.8E-02	0.8	8.50E-02
Dieldrin	1.6E+01	0.5	3.20E+01
Ethylbenzene	NA	0.8	ND
1,1,2-Trichloroethane	5.7E-02	0.8	7.13E-02
Trichloroethene	1.1E-02	0.8	1.38E-02

a = Based on gastrointestinal absorption factors provided in USEPA Region 4 *Supplemental Guidance to RAGS: Bulletin 2 — Toxicity Assessment* (USEPA, 1995).

b = Calculated using the following equation:
Dermal SF = oral SF ÷ oral absorption efficiency factor

ND = no data
NA = not applicable

Table 8-39D
Toxicity Assessment
Toxicity Values: Noncarcinogenic Effects — Dermal

Chemical	Exposure Length	Oral RfD mg/kg-day	Oral Absorption Efficiency Factor[a]	Default Dermal RfD[b] mg/kg-day
Acetone	Subchronic	1E-01	0.8	8.00E-02
Antimony	Chronic	4E-04	0.2	8.00E-05
Arsenic	Chronic	3E-04	0.2	6.00E-05
Benzene	Chronic	3E-03	0.5	1.50E-03
Benzo(a)pyrene	ND	ND	0.5	ND
2-Butanone	Subchronic	6E-01	0.8	4.80E-01
1,1-Dichloroethane	Subchronic	1E+00	0.8	8.00E-01
1,1-Dichloroethene	Chronic	9E-03	0.8	7.20E-03
1,2-Dichloroethane	Chronic	ND	0.8	ND
1,2-Dichloroethene (total)	Subchronic	9E-03	0.8	7.20E-03
1,2-Dichloropropane	ND	ND	0.8	ND
Dieldrin	Chronic	5E-05	0.5	2.50E-05
Ethylbenzene	Chronic	1E-01	0.8	8.00E-02
1,1,2-Trichloroethane	Chronic	4E-03	0.8	3.20E-03
Trichloroethene	ND	6E-03	0.8	4.80E-03

a = Based on gastrointestinal absorption factors provided in USEPA Region 4 *Supplemental Guidance to RAGS: Bulletin 2 — Toxicity Assessment* (USEPA, 1995).

b = Calculated using the following equation:
Dermal RfD = oral RfD × oral absorption efficiency factor

ND = no data
NA = not applicable

Table 8-40
Risk Estimates for COPCs in Soil
Assembly F - SWMU 22
NSA Mid-South, Millington, TN

Noncarcinogenic Hazard

Chemical	C_{sd}	Toxicity Values RfDo	Toxicity Values RfDd	Trespasser Ingestion IM	Trespasser Ingestion HQ	Trespasser Dermal Contact IM	Trespasser Dermal Contact HQ	Trespasser HI	Adult Worker Ingestion IM	Adult Worker Ingestion HQ	Adult Worker Dermal Contact IM	Adult Worker Dermal Contact HQ	Adult Worker HI	Construction Worker Ingestion IM	Construction Worker Ingestion HQ	Construction Worker Dermal Contact IM	Construction Worker Dermal Contact HQ	Construction Worker HI	Residential Child Ingestion IM	Residential Child Ingestion HQ	Residential Child Dermal Contact IM	Residential Child Dermal Contact HQ	Residential Child HI
Arsenic	22.2	3E-04	6.0E-05	3.2E-07	0.0234	1.3E-08	0.0048	0.03	1.76E-08	1E-03	1.44E-09	5E-04	0.002	9.39E-07	0.070	1.93E-08	0.0071	0.08	1.28E-05	0.95	1.85E-07	0.069	***1***
BEQ	0.517	NA	NA	3.2E-07	NA	1.3E-07	NA	NA	1.76E-08	NA	1.44E-08	NA	NA	9.39E-07	NA	1.93E-07	NA	NA	1.28E-05	NA	1.85E-06	NA	NA
							Total Hazard	0.03				Total Hazard	0.002				Total Hazard	0.08				Total Hazard	1

Carcinogenic Risk

Chemical	C_{sd}	Toxicity Values SFo	Toxicity Values SFd	Trespasser Ingestion IM	Trespasser Ingestion Risk	Trespasser Dermal Contact IM	Trespasser Dermal Contact Risk	Trespasser ILCR	Adult Worker Ingestion IM	Adult Worker Ingestion Risk	Adult Worker Dermal Contact IM	Adult Worker Dermal Contact Risk	Adult Worker ILCR	Construction Worker Ingestion IM	Construction Worker Ingestion Risk	Construction Worker Dermal Contact IM	Construction Worker Dermal Contact Risk	Construction Worker ILCR	Residential - Lifetime Weighted Average Ingestion IM	Residential - Lifetime Weighted Average Ingestion Risk	Residential - Lifetime Weighted Average Dermal Contact IM	Residential - Lifetime Weighted Average Dermal Contact Risk	Residential - Lifetime Weighted Average ILCR
Arsenic	22.2	1.5	7.5	4.5E-08	2E-06	1.85E-09	3E-07	***2E-06***	6.29E-09	2E-07	5.16E-10	2E-08	2E-07	4.03E-08	1E-06	8.25E-10	1E-07	***1E-06***	1.57E-06	5E-05	3.51E-08	6E-06	***6E-05***
BEQ	0.517	7.3	14.6	4.5E-08	2E-07	1.85E-08	1E-07	3E-07	6.29E-09	2E-08	5.16E-09	2E-08	4E-08	4.03E-08	2E-07	8.25E-09	6E-08	2E-07	1.57E-06	6E-06	3.51E-07	3E-06	***9E-06***
							Total Risk	2E-06				Total Risk	2E-07				Total Risk	1E-06				Total Risk	6E-05

Notes:

Values above acceptable risk or hazard levels are italicized and in boldface. Only these compounds are designated chemicals of concern (COCs).

Refer to Table 9-38 for a presentation of intake multipliers, Table 9-39A through 9-39D for toxicity values, and Table 9-20 for soil concentrations.

The hazard quotient is calculated using the equation: HQ = (IM × C_{sd}) ÷ RfD. Risk is calculated using the equation: Risk = IM × C_{sd} × SF.

COPC = chemical of potential concern
IM = intake multiplier (kg/kg-day)
C_s = soil concentration (mg/kg)
RfDo = oral reference dose (mg/kg-day)
RfDd = dermal reference dose (mg/kg-day)
HQ = hazard quotient (unitless)
HI = hazard index (unitless)
SFo = oral slope factor (kg-day/mg)
SFd = dermal slope factor (kg-day/mg)
ILCR = incremental lifetime cancer risk (unitless)
BEQ = benzo(a)pyrene equivalent concentration

Table 8-41
Risk Estimates for COPCs in Soil
Assembly F - SWMU 39
NSA Mid-South, Millington, TN

Noncarcinogenic Hazard

Chemical	C_{sd}	Toxicity Values RfDo	Toxicity Values RfDd	Trespasser Ingestion IM	Trespasser Ingestion HQ	Trespasser Dermal Contact IM	Trespasser Dermal Contact HQ	Trespasser HI	Adult Worker Ingestion IM	Adult Worker Ingestion HQ	Adult Worker Dermal Contact IM	Adult Worker Dermal Contact HQ	Adult Worker HI	Construction Worker Ingestion IM	Construction Worker Ingestion HQ	Construction Worker Dermal Contact IM	Construction Worker Dermal Contact HQ	Construction Worker HI	Residential Child Ingestion IM	Residential Child Ingestion HQ	Residential Child Dermal Contact IM	Residential Child Dermal Contact HQ	Residential Child HI
Dieldrin	0.13	5E-05	2.5E-05	3.2E-07	0.0008	1.3E-07	0.0007	0.0015	1.76E-08	5E-05	1.44E-08	8E-05	1E-04	9.39E-07	0.002	1.93E-07	0.0010	0.003	1.28E-05	0.03	1.85E-06	0.010	0.043
							Total Hazard	0.0015				Total Hazard	1E-04				Total Hazard	0.003				Total Hazard	0.043

Carcinogenic Risk

Chemical	C_{sd}	Toxicity Values SFo	Toxicity Values SFd	Trespasser Ingestion IM	Trespasser Ingestion Risk	Trespasser Dermal Contact IM	Trespasser Dermal Contact Risk	Trespasser ILCR	Adult Worker Ingestion IM	Adult Worker Ingestion Risk	Adult Worker Dermal Contact IM	Adult Worker Dermal Contact Risk	Adult Worker ILCR	Construction Worker Ingestion IM	Construction Worker Ingestion Risk	Construction Worker Dermal Contact IM	Construction Worker Dermal Contact Risk	Construction Worker ILCR	Residential - Lifetime Weighted Average Ingestion IM	Residential - Lifetime Weighted Average Ingestion Risk	Residential - Lifetime Weighted Average Dermal Contact IM	Residential - Lifetime Weighted Average Dermal Contact Risk	Residential - Lifetime Weighted Average ILCR
Dieldrin	0.13	16	32	4.5E-08	9E-08	1.9E-08	8E-08	2E-07	6.29E-09	1E-08	5.16E-09	1E-08	2E-08	4.03E-08	8E-08	8.25E-09	3E-08	1E-07	1.57E-06	3E-06	3.51E-07	1E-06	***5E-06***
							Total Risk	2E-07				Total Risk	2E-08				Total Risk	1E-07				Total Risk	5E-06

Notes:

Values above acceptable risk or hazard levels are italicized and in boldface. Only these compounds are designated chemicals of concern (COCs).

Refer to Table 9-38 for a presentation of intake multipliers, Table 9-39A through 9-39D for toxicity values, and Table 9-20 for soil concentrations.

The hazard quotient is calculated using the equation: HQ = (IM × C_{sd}) ÷ RfD. Risk is calculated using the equation: Risk = IM × Csd × SF.

COPC = Chemical of potential concern
IM = intake multiplier (kg/kg-day)
C_s = soil concentration (mg/kg)
RfDo = oral reference dose (mg/kg-day)
RfDd = dermal reference dose (mg/kg-day)
HQ = hazard quotient (unitless)
HI = hazard index (unitless)
SFo = Oral slope factor (kg-day/mg)
SFd = Dermal slope factor (kg-day/mg)
ILCR = incremental lifetime cancer risk (unitless)

Table 8-42
Point Risk Estimates for Carcinogenic COPCs in Groundwater
Assembly F - SWMU 17
Millington, TN

Noncarcinogenic Hazard

		Toxicity Values		Residential - Child				
Chemical	**C_w**	**RfDo**	**RfDd**	**Ingestion IM**	**Ingestion HQ**	**Dermal Contact IM**	**Dermal Contact HQ**	**HI**
Benzene	0.0011	3E-03	2E-03	6.39E-02	0.02	2.72E+00	***1***	1
1,2-Dichloropropane	0.03	NA	NA	6.39E-02	NA	1.93E+00	NA	NA
							Total Hazard	***1***

Carcinogenic Risk

		Toxicity Values		Residential - LWA				
Chemical	**C_w**	**SFo**	**SFd**	**Ingestion IM**	**Ingestion Risk**	**Dermal Contact IM**	**Dermal Contact Risk**	**ILCR**
Benzene	0.0011	2.9E-02	3.6E-02	1.57E-02	5E-07	1.47E-03	6E-08	6E-07
1,2-Dichloropropane	0.028	6.8E-02	8.5E-02	1.57E-02	3E-05	1.05E-03	2E-06	***3E-05***
							Total Risk	***3E-05***

Notes:

Values above acceptable risk or hazard levels are italicized and in boldface. Only these compounds are designated chemicals of concern (COCs).

Refer to Table 9-38 for a presentation of intake multipliers, Table 9-39A through 9-39D for toxicity values, and Table 9-20 for groundwater concentrations.

The hazard quotient is calculated using the equation: $HQ = (IM \times C_{sd}) \div RfD$. Risk is calculated using the equation: $Risk = IM \times C_{sd} \times SF$.

COPC = chemical of potential concern
IM = intake multiplier (L/kg-day)
C_w = water concentration (mg/L)
RfDo = oral reference dose (mg/kg-day)
RfDd = dermal reference dose (mg/kg-day)
HQ = hazard quotient (unitless)
HI = hazard index (unitless)
SFo = oral slope factor (kg-day/mg)
SFd = dermal slope factor (kg-day/mg)
ILCR = incremental lifetime cancer risk (unitless)

Table 8-43
Risk Estimates for COPCs in Groundwater
Assembly F - SWMU 20
Millington, TN

Noncarcinogenic Hazard

		Toxicity Values		Residential Child				
Chemical	C_w	**RfDo**	**RfDd**	**Ingestion IM**	**Ingestion HQ**	**Dermal Contact IM**	**Dermal Contact HQ**	**HI**
1,1,2-Trichloroethane	0.017	4E-03	3.2E-03	6.39E-02	0.3	2.07E+00	11	***11***
1,1-Dichloroethane	0.32	1E-01	8.0E-02	6.39E-02	0.2	1.44E+00	6	***6***
1,1-Dichloroethene	0.06	9E-03	7.2E-03	6.39E-02	0.4	2.56E+00	21	***22***
1,2-Dichloroethane	0.006	3E-02	2.4E-02	6.39E-02	0.01	8.55E-01	0.2	***0.2***
2-Butanone (MEK)	0.695	6E-01	4.8E-01	6.39E-02	0.07	1.32E-01	0.2	***0.3***
Acetone	0.23	1E-01	8.0E-02	6.39E-02	0.15	1.03E-02	0.03	***0.2***
Benzene	0.007	3E-03	2.4E-03	6.39E-02	0.1	2.72E+00	8	***8***
							Total Hazard	***48***

Carcinogenic Risk

		Toxicity Values		Residential - LWA				
Chemical	C_w	**SFo**	**SFd**	**Ingestion IM**	**Ingestion Risk**	**Dermal Contact IM**	**Dermal Contact Risk**	**ILCR**
1,1,2-Trichloroethane	0.017	5.70E-02	7.13E-02	1.57E-02	2E-05	1.12E-03	1E-06	***2E-05***
1,1-Dichloroethane	0.32	NA	NA	1.57E-02	NA	7.81E-04	NA	NA
1,1-Dichloroethene	0.06	6.0E-01	7.50E-01	1.57E-02	6E-04	1.38E-03	6E-05	***6E-04***
1,2-Dichloroethane	0.006	9.1E-02	1.14E-01	1.57E-02	9E-06	4.63E-04	3E-07	***9E-06***
2-Butanone (MEK)	0.695	NA	NA	1.57E-02	NA	7.14E-05	NA	NA
Acetone	0.23	NA	NA	1.57E-02	NA	5.60E-06	NA	NA
Benzene	0.007	2.9E-02	3.63E-02	1.57E-02	3E-06	1.47E-03	4E-07	***4E-06***
							Total Risk	***7E-04***
							6E-05	

Notes:

Values above acceptable risk or hazard levels are italicized and in boldface. Only these compounds are designated chemicals of concern (COCs).

Refer to Table 9-38 for a presentation of intake multipliers, Table 9-39A through 9-39D for toxicity values, and Table 9-20 for groundwater concentrations.

The hazard quotient is calculated using the equation: HQ = (IM × C_{sd}) ÷ RfD. Risk is calculated using the equation: Risk = IM × C_{sd} × SF.

COPC = chemical of potential concern
IM = intake multiplier (L/kg-day)
C_w = water concentration (mg/L)
RfDo = oral reference dose (mg/kg-day)
RfDd = dermal reference dose (mg/kg-day)
HQ = hazard quotient (unitless)
HI = hazard index (unitless)
SFo = oral slope factor (kg-day/mg)
SFd = dermal slope factor (kg-day/mg)
ILCR = incremental lifetime cancer risk (unitless)

Table 8-44
Risk Estimates for COPCs in Groundwater
Assembly F - SWMU 39
NSA Mid-South, Millington, TN

Noncarcinogenic Hazard

Chemical	C_w	Toxicity Values RfDo	RfDd	Residential - Child Ingestion IM	Ingestion HQ	Dermal Contact IM	Dermal Contact HQ	HI
Loess Groundwater								
Benzene	0.002	3E-03	2.40E-03	6.39E-02	0.04	2.72E+00	2	***2***
2-Butanone	0.2	6E-01	4.80E-01	6.39E-02	0.02	1.32E-01	0.05	0.08
1,2-Dichloroethene (Total)	0.026	9E-03	7.20E-03	6.39E-02	0.2	1.59E+00	6	***6***
Ethylbenzene	0.26	1E-01	8.00E-02	6.39E-02	0.2	1.53E+01	49.84	***50***
Trichloroethene	0.018	6E-03	4.80E-03	6.39E-02	0.2	3.91E+00	15	***15***
							Total Hazard	***73***
Fluvial Deposits Groundwater								
1,2-Dichloroethene (Total)	0.023	9E-03	7.20E-03	6.39E-02	0.2	1.59E+00	5.06E+00	***5***
Acetone	0.15	1E-01	8.00E-02	6.39E-02	0.1	1.03E-02	1.87E-02	0.1
Trichloroethene	0.16	6E-03	4.80E-03	6.39E-02	1.7	3.91E+00	1.30E+02	***132***
							Total Hazard	***137***

Carcinogenic Risk

Chemical	C_s	Toxicity Values SFo	SFd	Residential - LWA Ingestion IM	Ingestion Risk	Dermal Contact IM	Dermal Contact Risk	ILCR
Loess Groundwater								
Benzene	0.002	2.9E-02	3.63E-02	1.57E-02	9.1E-07	1.47E-03	1.1E-07	1.0E-06
2-Butanone	0.2	NA	NA	1.57E-02	NA	7.1E-05	NA	NA
1,2-Dichloroethene (Total)	0.026	ND	ND	1.57E-02	NA	8.6E-04	NA	NA
Ethylbenzene	0.26	NA	NA	1.57E-02	NA	8.3E-03	NA	NA
Trichloroethene	0.018	1.1E-02	1.38E-02	1.57E-02	3.1E-06	2.1E-03	5.2E-07	***3.6E-06***
Fluvial Deposits Groundwater								
1,2-Dichloroethene (Total)	0.023	ND	ND	1.57E-02	NA	NA	NA	NA
Acetone	0.15	NA	NA	1.57E-02	NA	NA	NA	NA
Trichloroethene	0.16	1.1E-02	1.38E-02	1.57E-02	2.8E-05	2.1E-03	4.7E-06	***3.2E-05***
							Total Risk	4E-05

Notes:

Values above acceptable risk or hazard levels are italicized and in boldface. Only these compounds are designated chemicals of concern (COCs).

Refer to Table 9-38 for a presentation of intake multipliers. Table 9-39A through 9-39D for toxicity values. and Table 9-20 for groundwater concentrations.

The hazard quotient is calculated using the equation: $HQ = (IM \times C_w) \div RfD$. Risk is calculated using the equation: $Risk = IM \times C_w \times SF$.

COPC = chemical of potential concern
IM = intake multiplier (L/kg-day)
C_w = water concentration (mg/L)
RfDo = oral reference dose (mg/kg-day)
RfDd = dermal reference dose (mg/kg-day)
HQ = hazard quotient (unitless)
HI = hazard index (unitless)
SFo = oral slope factor (kg-day/mg)
SFd = dermal slope factor (kg-day/mg)
ILCR = incremental lifetime cancer risk (unitless)

Table 8-45A
Remedial Goal Options — Soil
Assembly F
NSA Mid-South, Millington, Tennessee

					Remedial Goal Options (mg/kg)					
					Carcinogenic Risk			Noncarcinogenic Risk		
Receptor	**Parameter**	**EPC (mg/kg)**	**Estimated Carcinogenic Risk**	**Estimated Noncarcinogenic Risk**	**1E-06**	**1E-05**	**1E-04**	**0.1**	**1**	**3**
SWMU 22 Soil										
Resident	arsenic	22.2	6E-05	1	NA	NA	NA	2.2	22	67
	benzo(a)pyrene as BEQ	0.517	9E-06	NA	0.06	0.6	6	NA	NA	NA
Trespasser	arsenic	22.2	2E-06	0.03	11	111	1110	74	740	2220
SWMU 39 Soil										
Resident	dieldrin	0.13	5E-06	0.043	0.03	0.3	3	0.3	3	9

Notes:

Refer to Tables 9-40 and 9-41 for a detailed presentation of carcinogenic and noncarcinogenic risks.

EPC = exposure point concentration
mg/kg = milligram per kilogram
NA = not applicable
BEQ = benzo(a)pyrene equivalent concentration

1 = Because of the small sample size for this medium, the maximum concentration was selected as the EPC. Refer to Table 31 for the EPC statistics for this site.

Table 8-45B
Remedial Goal Options — Groundwater
Assembly F
NSA Mid-South, Millington, Tennessee

					Remedial Goal Options (mg/L)					
					Carcinogenic Risk			Noncarcinogenic Risk		
Receptor	Parameter	EPC (mg/L)	Estimated Carcinogenic Risk	Estimated Noncarcinogenic Risk	1E-06	1E-05	1E-04	0.1	1	3
SWMU 17 Groundwater										
Resident	benzene	0.0011	NA	1	NA	NA	NA	0.0001	0.001	0.003
	1,2-dichloropropane	0.03	3.00E-05	NA	0.001	0.01	0.1	NA	NA	NA
SWMU 20 Groundwater										
Resident	1,1,2-trichloroethane	0.017	2E-05	11	0.0009	0.009	0.09	0.0002	0.002	0.005
	1,1-dichloroethane	0.32	NA	6	NA	NA	NA	0.005	0.05	0.2
	1,1-dichloroethene	0.06	6E-04	22	0.0001	0.001	0.01	0.0003	0.003	0.008
	1,2-dichloroethane	0.006	9E-06	0.2	0.0007	0.007	0.07	0.003	0.03	0.09
	2-butanone	0.695	NA	0.3	NA	NA	NA	0.23	2.3	7
	acetone	0.23	NA	0.2	NA	NA	NA	0.12	1.2	3.5
	benzene	0.007	4E-06	8	0.0018	0.018	0.18	0.00009	0.0009	0.0026
SWMU 39 Groundwater										
Loess Resident	benzene	0.002	NA	2	NA	NA	NA	0.0001	0.001	0.003
	1,2-dichloroethene (total)	0.2	NA	6	NA	NA	NA	0.003	0.03	0.1
	ethylbenzene	0.026	NA	50	NA	NA	NA	0.00005	0.0005	0.002
	trichloroethene	0.018	3.6E-06	15	0.005	0.05	0.5	0.00012	0.0012	0.0036
Fluvial deposits										
Resident	1,2-dichloroethene (total)	0.023	NA	5	NA	NA	NA	0.0005	0.005	0.014
	acetone	0.46	NA	0.4	NA	NA	NA	0.12	1.2	3.5
	trichloroethene	0.16	3.2E-05	132	0.005	0.05	0.5	0.00012	0.0012	0.0036

EPC = exposure point concentration
mg/L = milligram per liter
NA = not applicable

a = Because of the small sample size for this medium, the maximum concentration was selected as the EPC. Refer to Table 31 for the EPC statistics for this site.

Refer to Tables 63 and 65 for a detailed presentation of carcinogenic and noncarcinogenic risks.

9.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are presented for each Assembly F SWMU, except SWMU 30 (Park Field Septic Tank), which was recommended for no further action in the *Confirmatory Sampling Investigation Report - Assembly F* (EnSafe, July 31, 1998).

All assessments, including nature and extent (Section 5), fate and transport (Section 6), ecological risk assessment (Section 7), and human health risk assessment (Section 8) were as a basis for these conclusions. Recommendations and the rationale for each are presented in Table 9.1 and the following text.

9.1 SWMU 17

Petroleum (probably waste oil) has been released in the UWT S-9 area, based on the presence of TPH in the subsurface soil at a concentration of 320 mg/kg in the tank pit area, and the exceedances of the 100 mg/kg TPH cleanup level along the pipeline leading to Building S-9. This release will be addressed during the VCA planned for Spring 2000.

Groundwater sampling data collected did not indicate any significant impact from the tank S-9 release. The petroleum and solvent-related compounds detected in groundwater are likely constituents of waste oil. Although 1,2-dichloropropane was detected in the immediate area of the former underground tank, surrounding groundwater locations were nondetect for this compound, suggesting that it does not extend far from the immediate area of the former tank.

After the petroleum contaminated soil at SWMU 17 is removed, no further action is recommended for SWMU 17.

9.2 SWMU 19

When tank 1648 was removed in 1992, evidence of a release was visually observed, and later confirmed during follow-up DPT/soil sampling. Petroleum concentrations ranging from 120 to 4,600 mg/kg were detected in the surrounding soil, with the contamination extending beneath Building 757. A VCA to address this contamination will be conducted once the building has been demolished, which is tentatively scheduled for fiscal year 2000.

No contaminants of concern were identified in either the loess or the fluvial deposits groundwater in the SWMU 19 area.

After the VCA to address the petroleum contamination is complete, no further action is recommended for SWMU 19.

9.3 SWMU 20

The former location of UWT 1594 has been redeveloped as a parking lot. The tank removed from this area contained evidence of cleaning solvents, as well as petroleum constituents. Soil samples collected from the tank pit and the surrounding area after the tank was removed indicated a potential release that may have had limited impact on the surrounding area. As noted in Section 5.4.1, and shown on Figure 5.10, several compounds, primarily solvents, exceeded their SSLs in the area immediately surrounding the tank/tank pit. However, these compounds were not identified as COCs in the HHRA, and do not pose an excess human health exposure risk.

Samples were also collected from this site to assess any impact to the fluvial deposits groundwater. Groundwater sampling data from the area immediately surrounding the tank pit indicate that the compounds released to the soil may have leached to the groundwater. However, based on data from the downgradient fluvial deposits monitoring well, the contamination appears to be confined to the tank pit area. Although only limited downgradient data exist, a release of materials of this

nature (very soluble, very mobile) would be expected to be detectable downgradient of the suspected release point if the contamination was widespread and migrating.

No further action is recommended for SWMU 20 based on the absence of solvent detections in the fluvial deposits groundwater down gradient of the suspected release point, and because the HHRA did not identify any COCs.

9.4 SWMU 22

SWMU 22 consisted of four USTs located west of Building S-75. The field-constructed tanks reportedly contained fuel oil and diesel before they were taken out of service. Subsurface soil data indicated that residual petroleum contamination in the tank pit areas exceeds TDEC clean-up levels (greater than 1,000 mg/kg TPH). This contamination appears to be limited to the tank pit areas and will be addressed under a VCA.

Because SWMU 22 is hydraulically down gradient of SWMU 39, and close to SWMU 63, groundwater in this area was addressed during the SWMU 39 investigation, which is discussed below.

After the petroleum-contaminated soil is removed, no further action will be required at SWMU 22.

9.5 SWMU 39

The site of former Building S-74 originally housed the base laundry and dry-cleaning facility, and was later used as a storage area for transformers that contained PCBs. Area soil and groundwater contaminants indicate of a release of chlorinated solvents and petroleum-related compounds (assumed to be Stoddard solvent).

Chlorinated solvents detected in surface soil samples from beneath the Building S-74's concrete foundation could pose an exposure risk if the slab is removed. Further delineation of this area, and the potential impact of removing the slab, should be considered and addressed through a Corrective Measures Study.

Loess and the fluvial deposits groundwater has been impacted by previous operations in the Building S-74 area. The loess groundwater data are consistent with a petroleum hydrocarbon and chlorinated solvent release and is thought to be related to the Building S-74 dry-cleaning operations. Although the impact to the loess groundwater appears to be isolated, further monitoring of site conditions is warranted to ensure that migration does not occur. A monitoring program for the SWMU 39 loess groundwater should be evaluated in a Corrective Measures Study.

Data collected from the fluvial deposits indicates that past operations in the SWMU 39 area have impacted deeper groundwater. Dry-cleaning operations at the former base laundry (Building S-74) may have resulted in a release, but a spatial analysis of the data indicates that the Building S-203 area may have been a source as well. Although the exact source of the contamination has not been determined, the downgradient extent has been defined and appears to be confined to Navy property. However, further evaluation is recommended to determine the appropriate course of action to prevent further contaminant migration, as well as the exact nature of any degradation processes that may be occurring. A Corrective Measures Study is recommended to evaluate the remedial alternatives for the SWMU 39 fluvial deposits groundwater contamination.

9.6 SWMU 63

SWMU 63 consisted of a 65-gallon UWT that was removed in 1992. No further action is recommended at SWMU 63 because area soil is not contaminated and groundwater is addressed under the SWMU 39 investigation.

Table 9.1
Conclusions and Recommendations Summary

		HHRA Results (estimated risk)					
		Soil		Groundwater			
Site	Site Description	COC (EPC)[a]	RGO[b] (mg/kg)	COC (EPC)[c]	RGO (mg/L)[d]	Conclusion	Recommendation
17	UWT 5-9	TPH	N/A	1,2-dichloropropane (0.03) benzene (0.0011)	0.001 0.001	TPH concentrations in soil exceed the TDEC cleanup level. Groundwater detections are low and infrequent	Conditional NFA[e] based on conducting a VCA to address soil TPH contamination
19	UST 1648 (NEX service station)	TPH	N/A	None	N/A	TPH concentrations in soil exceed the TDEC cleanup level.	Conditional NFA based on conducting a VCA to address soil TPH contamination
20	UWT 1594	None	N/A	1,1,2-trichloroethane (0.017) 1,1-dichloroethane (0.32) 1,1-dichloroethene (0.06) 1,2-dichloroethane (0.006) 2-butanone (0.695) acetone (0.23) benzene (0.007)	0.0009 0.05 0.0001 0.0007 2.3 1.2 0.0009	Low concentrations of VOCs were detected in fluvial deposits groundwater screening samples, but they have not migrated down gradient	NFA

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Table 9.1
Conclusions and Recommendations Summary

HHRA Results (estimated risk)

		Soil		Groundwater			
Site	**Site Description**	**COC (EPC)[a]**	**RGO[b] (mg/kg)**	**COC (EPC)[c]**	**RGO (mg/L)[d]**	**Conclusion**	**Recommendation**
22	Four USTs west of Building S-75	Arsenic (22.2) Benzo(a)pyrene (0.517) TPH	2.2 0.06 N/A	None	N/A	TPH concentrations in soil exceed the TDEC cleanup level. Fluvial deposits groundwater is being addressed under the SWMU 39 RFI/CMS	Conditional NFA based on conducting a VCA to address soil TPH contamination
39	Building S-74 (Former base laundry/dry cleaner and PCB Storage area)	Dieldrin (0.13)	0.03	Benzene (0.002) 1,2-dichloroethene (0.2)[f] Ethylbenzene (0.026) Acetone (0.46) trichloroethene (0.16)[f]	0.001 0.005 0.005 1.2 0.0012	Trichloroethene (and petroleum related compounds) detected in groundwater.	Corrective Measures Study is recommended to address soil contamination, loess groundwater contamination, and fluvial deposits groundwater contamination
63	65-gallon, stainless-steel UWT	None	N/A	None	N/A	Fluvial deposits groundwater is being addressed under the SWMU 39 RFI/CMS	NFA

Notes:

a — Chemical of Concern as identified it the HHRA. Exposure Point Concentration (EPC) in mg/kg is determined using methodologies outlined in Section 8.4.1.

b — RGO as defined in Section 8.8

c — Chemicla of Concern as identified it the HHRA. Exposure Point Concentration (EPC) in mg/L is determined using methodologies outlined in Section 8.4.1.

d — RGO as defined in Section 9.8 Assumes a carcinogenic risk of 1E-06 or a noncarcinogenic risk of 1. If data for both carcinogenic and noncarcinogenic risk are available for the same COC, the more conservative of the two has been included in this summary.

e — NFA - No further action is recommended at this site.

f — Groundwater CoCs presented for SWMU 39 are a combination of both loess and fluvial deposits groundwater CoCs. The more conservative (higher concentrations) EPC has been used for comparison and summary.

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10.0 REFERENCES

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NSA MID-SOUTH
NSA MID-SOUTH, RFI, ASSEMBLY F
SWMU 20 VOCs in Groundwater

SW846-VOA													
		SAMPLE ID ------->	020-G-0009-40		020-G-0009-50		020-H-0009-50		020-G-0009-60		020-G-PZ01-01		020-H-PZ01-01	
		ORIGINAL ID ----->	020G000940		020G000950		020H000950		020G000960		020GPZ0101		020HPZ0101	
		LAB SAMPLE ID --->	S882772*7		S882772*8		S882772*9		S882801*1		S885127*1		S885127*4	
		ID FROM REPORT -->	020G000940		020G000950		020H000950		020G000960		020GPZ0101		020HPZ0101	
		SAMPLE DATE ----->	05/13/98		05/13/98		05/13/98		05/14/98		08/25/98		08/25/98	
		DATE ANALYZED --->	05/26/98		05/26/98		05/26/98		05/27/98		09/05/98		09/07/98	
		MATRIX ---------->	Water		Water		Water		Water		Water		Water	
		UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter		MEM48	VAL	MEM48	VAL	MEM48	VAL	MEM48	VAL	MEM62	VAL	MEM62	VAL
74-87-3	Chloromethane		10.	UJ	10.	UJ	10.	UJ	10.	U	10.	U	10.	U
74-83-9	Bromomethane		10.	UJ	10.	UJ	10.	UJ	10.	U	10.	U	10.	U
75-01-4	Vinyl chloride		10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-00-3	Chloroethane		10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-35-4	1,1-Dichloroethene		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-09-2	Methylene chloride		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-34-3	1,1-Dichloroethane		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
67-66-3	Chloroform		5.	UJ	5.	UJ	5.	UJ	5.	U	5.	U	5.	U
71-55-6	1,1,1-Trichloroethane		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
56-23-5	Carbon tetrachloride		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
71-43-2	Benzene		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
107-06-2	1,2-Dichloroethane		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
79-01-6	Trichloroethene		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
78-87-5	1,2-Dichloropropane		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-27-4	Bromodichloromethane		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-88-3	Toluene		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
79-00-5	1,1,2-Trichloroethane		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
127-18-4	Tetrachloroethene		5.	UJ	5.	UJ	5.	UJ	5.	U	5.	U	5.	U
124-48-1	Dibromochloromethane		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-90-7	Chlorobenzene		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
100-41-4	Ethylbenzene		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
100-42-5	Styrene		5.	UJ	5.	UJ	5.	UJ	5.	U	5.	U	5.	U
75-25-2	Bromoform		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
79-34-5	1,1,2,2-Tetrachloroethane		5.	UJ	5.	UJ	5.	UJ	5.	U	5.	U	5.	U
67-64-1	Acetone		50.	U	50.	U	50.	U	50.	U	160.	J	300.	J
75-15-0	Carbon disulfide		5.	UJ	5.	UJ	5.	UJ	5.	U	5.	U	5.	U
78-93-3	2-Butanone (MEK)		25.	U	25.	U	25.	U	25.	U	500.	J	890.	J
108-10-1	4-Methyl-2-Pentanone (MIBK)		25.	U	25.	U	25.	U	25.	U	25.	U	25.	U
10061-01-5	cis-1,3-Dichloropropene		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
10061-02-6	trans-1,3-Dichloropropene		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
591-78-6	2-Hexanone		25.	U	25.	U	25.	U	25.	U	25.	U	25.	U
1330-20-7	Xylene (Total)		5.	UJ	5.	UJ	5.	UJ	5.	U	5.	U	5.	U
540-59-0	1,2-Dichloroethene (total)		5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
9999000-44-2	XYLENES		NR		NR		NR		NR		NR		NR	
156-60-5	trans-1,2-Dichloroethene		NR		NR		NR		NR		NR		NR	
156-59-2	cis-1,2-Dichloroethene		NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, RFI, ASSEMBLY F
SWMU 20 VOCs in Groundwater

SW846-VOA								
	SAMPLE ID ------->	020-G-PZ02-01		020-G-PZ03-01				
	ORIGINAL ID ----->	020GPZ0201		020GPZ0301				
	LAB SAMPLE ID --->	S885127*2		S885127*3				
	ID FROM REPORT -->	020GPZ0201		020GPZ0301				
	SAMPLE DATE ----->	08/25/98		08/25/98				
	DATE ANALYZED --->	09/05/98		09/05/98				
	MATRIX ---------->	Water		Water				
	UNITS ---------->	UG/L		UG/L				
CAS #	Parameter	MEM62	VAL	MEM62	VAL			
74-87-3	Chloromethane	10.	U	10.	U			
74-83-9	Bromomethane	10.	U	10.	U			
75-01-4	Vinyl chloride	10.	U	10.	U			
75-00-3	Chloroethane	10.	U	10.	U			
75-35-4	1,1-Dichloroethene	5.	U	5.	U			
75-09-2	Methylene chloride	5.	U	5.	U			
75-34-3	1,1-Dichloroethane	5.	U	5.	U			
67-66-3	Chloroform	5.	U	5.	U			
71-55-6	1,1,1-Trichloroethane	5.	U	5.	U			
56-23-5	Carbon tetrachloride	5.	U	5.	U			
71-43-2	Benzene	5.	U	5.	U			
107-06-2	1,2-Dichloroethane	5.	U	5.	U			
79-01-6	Trichloroethene	5.	U	5.	U			
78-87-5	1,2-Dichloropropane	5.	U	5.	U			
75-27-4	Bromodichloromethane	5.	U	5.	U			
108-88-3	Toluene	5.	U	5.	U			
79-00-5	1,1,2-Trichloroethane	5.	U	5.	U			
127-18-4	Tetrachloroethene	5.	U	5.	U			
124-48-1	Dibromochloromethane	5.	U	5.	U			
108-90-7	Chlorobenzene	5.	U	5.	U			
100-41-4	Ethylbenzene	5.	U	5.	U			
100-42-5	Styrene	5.	U	5.	U			
75-25-2	Bromoform	5.	U	5.	U			
79-34-5	1,1,2,2-Tetrachloroethane	5.	U	5.	U			
67-64-1	Acetone	50.	U	50.	U			
75-15-0	Carbon disulfide	5.	U	5.	U			
78-93-3	2-Butanone (MEK)	25.	U	25.	U			
108-10-1	4-Methyl-2-Pentanone (MIBK)	25.	U	25.	U			
10061-01-5	cis-1,3-Dichloropropene	5.	U	5.	U			
10061-02-6	trans-1,3-Dichloropropene	5.	U	5.	U			
591-78-6	2-Hexanone	25.	U	25.	U			
1330-20-7	Xylene (Total)	5.	U	5.	U			
540-59-0	1,2-Dichloroethene (total)	5.	U	5.	U			
9999000-44-2	XYLENES	NR		NR				
156-60-5	trans-1,2-Dichloroethene	NR		NR				
156-59-2	cis-1,2-Dichloroethene	NR		NR				

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 22 Herbicides in Surface Soil

SW846-HERB								
	SAMPLE ID ------->	022-S-GB03-01		022-S-GB04-01				
	ORIGINAL ID ----->	022SGB0301		022SGB0401				
	LAB SAMPLE ID --->	155797		155909				
	ID FROM REPORT -->	022SGB0301		022SGB0401				
	SAMPLE DATE ----->	10/17/96		10/18/96				
	DATE EXTRACTED -->	10/30/96		10/30/96				
	DATE ANALYZED --->	11/02/96		11/02/96				
	MATRIX ---------->	Soil		Soil				
	UNITS ---------->	ug/Kg		ug/Kg				
CAS #	Parameter	2045	VAL	2056	VAL			
94-75-7	2,4-D	9.4	U	9.4	U			
94-82-6	2,4-DB	9.5	UJ	9.5	U			
88-85-7	Dinoseb	4.7	U	4.7	U			
93-76-5	2,4,5-T	0.95	U	0.95	U			
93-72-1	2,4,5-TP (Silvex)	0.95	U	1.9	NJ			
75-99-0	Dalapon	23.	U	23.	U			
1918-00-9	Dicamba	0.94	U	0.94	U			
120-36-5	Dichlorprop	9.4	U	9.4	U			
94-74-6	MCPA	940.	U	940.	U			
93-65-2	MCPP	940.	U	940.	U			

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 22 Inorganics in Surface Soil

APX9-METAL									
		SAMPLE ID ------->	022-S-GB03-01		022-S-GB04-01					
		ORIGINAL ID ----->	022SGB0301		022SGB0401					
		LAB SAMPLE ID --->	155797S		155909S					
		ID FROM REPORT -->	022SGB0301		022SGB0401					
		SAMPLE DATE ----->	10/17/96		10/18/96					
		MATRIX ---------->	Soil		Soil					
		UNITS ---------->	MG/KG		MG/KG					
CAS #	Parameter		2045	VAL	2056	VAL				
7440-36-0	Antimony		4.1	UR	3.9	UJ				
7440-38-2	Arsenic		22.2		12.5					
7440-39-3	Barium		51.9		45.2					
7440-41-7	Beryllium		0.36	J	0.34	J				
7440-43-9	Cadmium		0.49	UJ	0.48	U				
7440-47-3	Chromium		13.8		12.3					
7440-48-4	Cobalt		6.7		4.9	J				
7440-50-8	Copper		12.5		11.2					
7439-92-1	Lead		35.1		12.4					
7439-97-6	Mercury		0.04	J	0.04	J				
7440-02-0	Nickel		12.1		8.9					
7782-49-2	Selenium		0.35	UJ	0.51	J				
7440-22-4	Silver		0.57	U	0.55	U				
7440-28-0	Thallium		0.33	J	0.24	U				
7440-62-2	Vanadium		26.7		25.4					
7440-66-6	Zinc		37.6		35.3					
7440-31-5	Tin		5.6	U	5.4	U				

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 22 Inorganics in Surface Soil

APX9-METAL								
	SAMPLE ID ------->	022-S-GB03-01		022-S-GB04-01				
	ORIGINAL ID ----->	022SGB0301		022SGB0401				
	LAB SAMPLE ID --->	155797S		155909S				
	ID FROM REPORT -->	022SGB0301		022SGB0401				
	SAMPLE DATE ----->	10/17/96		10/18/96				
	MATRIX ---------->	Soil		Soil				
	UNITS ---------->	MG/KG		MG/KG				
CAS #	Parameter	2045	VAL	2056	VAL			
7440-36-0	Antimony	4.1	UR	3.9	UJ			
7440-38-2	Arsenic	22.2		12.5				
7440-39-3	Barium	51.9		45.2				
7440-41-7	Beryllium	0.36	J	0.34	J			
7440-43-9	Cadmium	0.49	UJ	0.48	U			
7440-47-3	Chromium	13.8		12.3				
7440-48-4	Cobalt	6.7		4.9	J			
7440-50-8	Copper	12.5		11.2				
7439-92-1	Lead	35.1		12.4				
7439-97-6	Mercury	0.04	J	0.04	J			
7440-02-0	Nickel	12.1		8.9				
7782-49-2	Selenium	0.35	UJ	0.51	J			
7440-22-4	Silver	0.57	U	0.55	U			
7440-28-0	Thallium	0.33	J	0.24	U			
7440-62-2	Vanadium	26.7		25.4				
7440-66-6	Zinc	37.6		35.3				
7440-31-5	Tin	5.6	U	5.4	U			

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 22 Inorganics in Surface Soil

METAL-CN								
		SAMPLE ID ------->	022-S-GB03-01		022-S-GB04-01			
		ORIGINAL ID ----->	022SBG0301		022SGB0401			
		LAB SAMPLE ID --->	155797		155909			
		ID FROM REPORT -->	022SBG0301		022SGB0401			
		SAMPLE DATE ----->	10/17/96		10/18/96			
		DATE EXTRACTED -->			10/30/96			
		DATE ANALYZED --->	10/18/96		11/01/96			
		MATRIX ---------->	Soil		Soil			
		UNITS ---------->	MG/KG		MG/KG			
CAS #	Parameter		2045	VAL	2056	VAL		
57-12-5	Cyanide (CN)		0.5	U	0.5	U		

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 22 OP Pesticides in Surface Soil

SW846-OP P								
	SAMPLE ID ------->	022-S-GB03-01		022-S-GB04-01				
	ORIGINAL ID ----->	022SGB0301		022SGB0401				
	LAB SAMPLE ID --->	155797		155909				
	ID FROM REPORT -->	022SGB0301		022SGB0401				
	SAMPLE DATE ----->	10/17/96		10/18/96				
	DATE EXTRACTED -->	10/21/96		10/24/96				
	DATE ANALYZED --->	10/24/96		11/12/96				
	MATRIX ---------->	Soil		Soil				
	UNITS ---------->	ug/Kg		ug/Kg				
CAS #	Parameter	2045	VAL	2056	VAL			
62-73-7	Dichlorvos	100.	U	100.	U			
7786-34-7	Mevinphos, Alpha	100.	U	100.	U			
8065-48-3	Demeton,O	100.	U	100.	U			
13194-48-4	Ethoprop	100.	U	100.	U			
300-76-5	Naled	200.	U	100.	U			
298-02-2	Phorate	100.	U	100.	U			
126-75-0	Demeton,S	100.	U	100.	U			
333-41-5	Diazinon	100.	U	100.	U			
298-04-4	Disulfoton	100.	U	100.	U			
298-00-0	Methyl parathion	100.	U	100.	U			
299-84-3	Ronnel	100.	U	100.	U			
55-38-9	Fenthion	100.	U	100.	U			
2921-88-2	Chloropyrifos	100.	U	100.	U			
327-98-0	Trichloronate	100.	U	100.	U			
150-50-5	Merphos	100.	U	100.	U			
34643-46-4	Tokuthion	100.	U	100.	U			
115-90-2	Fensulfothion	100.	U	100.	U			
22248-79-9	Stirophos (Tetrachlorovinphos)	100.	U	100.	U			
35400-43-2	Sulprofos (Bolstar)	100.	U	100.	U			
86-50-0	Azinphos methyl	100.	U	100.	U			
56-72-4	Coumaphos	100.	U	100.	U			

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 22 Pesticides in Surface Soil

SW846-PEST								
	SAMPLE ID ------->	022-S-GB03-01		022-S-GB04-01				
	ORIGINAL ID ----->	022SGB0301		022SGB0401				
	LAB SAMPLE ID --->	155797		155909				
	ID FROM REPORT -->	022SGB0301		022SGB0401				
	SAMPLE DATE ----->	10/17/96		10/18/96				
	DATE EXTRACTED -->	10/21/96		10/24/96				
	DATE ANALYZED --->	10/31/96		10/31/96				
	MATRIX ---------->	Soil		Soil				
	UNITS ---------->	ug/Kg		ug/Kg				
CAS #	Parameter	2045	VAL	2056	VAL			
319-84-6	alpha-BHC	2.	U	2.	U			
319-85-7	beta-BHC	2.	U	2.	U			
319-86-8	delta-BHC	2.	U	2.	U			
58-89-9	gamma-BHC (Lindane)	2.	U	2.	U			
76-44-8	Heptachlor	2.	U	2.	U			
309-00-2	Aldrin	2.	U	2.	U			
1024-57-3	Heptachlor epoxide	1.4	U	2.3	U			
959-98-8	Endosulfan I	2.	U	2.	U			
60-57-1	Dieldrin	4.1	U	4.1	U			
72-55-9	4,4'-DDE	4.1	U	4.1	U			
72-20-8	Endrin	4.1	U	4.1	U			
33213-65-9	Endosulfan II	4.1	U	4.1	U			
72-54-8	4,4'-DDD	4.1	U	4.1	U			
1031-07-8	Endosulfan sulfate	4.1	U	4.1	U			
50-29-3	4,4'-DDT	4.1	U	4.3	U			
72-43-5	Methoxychlor	20.	U	20.	U			
53494-70-5	Endrin ketone	4.1	U	4.1	U			
7421-93-4	Endrin aldehyde	4.1	U	4.1	U			
5103-71-9	alpha-Chlordane	2.	U	2.	U			
5103-74-2	gamma-Chlordane	2.	U	2.	U			
8001-35-2	Toxaphene	41.	U	41.	U			
12674-11-2	Aroclor-1016	41.	U	41.	U			
11104-28-2	Aroclor-1221	41.	U	41.	U			
11141-16-5	Aroclor-1232	41.	U	41.	U			
53469-21-9	Aroclor-1242	41.	U	41.	U			
12672-29-6	Aroclor-1248	41.	U	41.	U			
11097-69-1	Aroclor-1254	41.	U	41.	U			
11096-82-5	Aroclor-1260	41.	U	41.	U			
12789-03-6	Technical Chlordane	41.	U	41.	U			

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 22 SVOCs in Surface Soil

SW846-SVOA								
	SAMPLE ID ------->	022-S-GB03-01		022-S-GB04-01				
	ORIGINAL ID ----->	022SGB0301		022SGB0404				
	LAB SAMPLE ID --->	155797		155909				
	ID FROM REPORT -->	022sgb0301		022SGB0404				
	SAMPLE DATE ----->	10/17/96		10/18/96				
	DATE EXTRACTED -->	10/22/96		10/24/96				
	DATE ANALYZED --->	10/22/96		10/25/96				
	MATRIX ---------->	Soil		Soil				
	UNITS ---------->	ug/Kg		UG/KG				
CAS #	Parameter	2045	VAL	2056	VAL			
108-95-2	Phenol	420.	U	410.	U			
111-44-4	bis(2-Chloroethyl)ether	420.	U	410.	U			
95-57-8	2-Chlorophenol	420.	U	410.	U			
541-73-1	1,3-Dichlorobenzene	420.	U	410.	U			
106-46-7	1,4-Dichlorobenzene	420.	U	410.	U			
95-50-1	1,2-Dichlorobenzene	420.	U	410.	U			
95-48-7	2-Methylphenol (o-Cresol)	420.	U	410.	U			
108-60-1	2,2'-oxybis(1-Chloropropane)	420.	U	410.	U			
106-44-5	4-Methylphenol (p-Cresol)	420.	U	410.	U			
621-64-7	N-Nitroso-di-n-propylamine	420.	U	410.	U			
67-72-1	Hexachloroethane	420.	U	410.	U			
98-95-3	Nitrobenzene	420.	U	410.	U			
78-59-1	Isophorone	420.	U	410.	U			
88-75-5	2-Nitrophenol	420.	U	410.	U			
105-67-9	2,4-Dimethylphenol	420.	U	410.	U			
120-83-2	2,4-Dichlorophenol	420.	U	410.	U			
120-82-1	1,2,4-Trichlorobenzene	420.	U	410.	U			
91-20-3	Naphthalene	280.	J	410.	U			
106-47-8	4-Chloroaniline	420.	U	410.	U			
87-68-3	Hexachlorobutadiene	420.	U	410.	U			
111-91-1	bis(2-Chloroethoxy)methane	420.	U	410.	U			
59-50-7	4-Chloro-3-methylphenol	420.	U	410.	U			
91-57-6	2-Methylnaphthalene	360.	J	410.	U			
77-47-4	Hexachlorocyclopentadiene	420.	U	410.	U			
88-06-2	2,4,6-Trichlorophenol	420.	U	410.	U			
95-95-4	2,4,5-Trichlorophenol	1000.	U	1000.	U			
91-58-7	2-Chloronaphthalene	420.	U	410.	U			
88-74-4	2-Nitroaniline	1000.	U	1000.	U			
131-11-3	Dimethylphthalate	420.	U	410.	U			
208-96-8	Acenaphthylene	420.	U	110.	J			
606-20-2	2,6-Dinitrotoluene	420.	U	410.	U			
99-09-2	3-Nitroaniline	1000.	U	1000.	U			
83-32-9	Acenaphthene	420.	U	410.	U			
51-28-5	2,4-Dinitrophenol	1000.	U	1000.	U			
100-02-7	4-Nitrophenol	1000.	U	1000.	U			
132-64-9	Dibenzofuran	420.	U	410.	U			

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 22 SVOCs in Surface Soil

SW846-SVOA								
	SAMPLE ID ------->	022-S-GB03-01		022-S-GB04-01				
	ORIGINAL ID ----->	022SGB0301		022SGB0404				
	LAB SAMPLE ID --->	155797		155909				
	ID FROM REPORT -->	022sgb0301		022SGB0404				
	SAMPLE DATE ----->	10/17/96		10/18/96				
	DATE EXTRACTED -->	10/22/96		10/24/96				
	DATE ANALYZED --->	10/22/96		10/25/96				
	MATRIX ---------->	Soil		Soil				
	UNITS ---------->	ug/Kg		UG/KG				
CAS #	Parameter	2045	VAL	2056	VAL			
121-14-2	2,4-Dinitrotoluene	420.	U	410.	U			
84-66-2	Diethylphthalate	420.	U	410.	U			
7005-72-3	4-Chlorophenylphenyl ether	420.	U	410.	U			
86-73-7	Fluorene	420.	U	410.	U			
100-01-6	4-Nitroaniline	1000.	U	1000.	U			
534-52-1	2-Methyl-4,6-Dinitrophenol	1000.	U	1000.	U			
86-30-6	N-Nitrosodiphenylamine	420.	U	410.	U			
101-55-3	4-Bromophenyl-phenylether	420.	U	410.	U			
118-74-1	Hexachlorobenzene	420.	U	410.	U			
87-86-5	Pentachlorophenol	1000.	U	1000.	U			
85-01-8	Phenanthrene	420.	U	410.	U			
120-12-7	Anthracene	420.	U	77.	J			
86-74-8	Carbazole	420.	U	410.	U			
84-74-2	Di-n-butylphthalate	420.	U	410.	U			
206-44-0	Fluoranthene	75.	J	140.	J			
129-00-0	Pyrene	65.	J	240.	J			
85-68-7	Butylbenzylphthalate	420.	U	410.	U			
91-94-1	3,3'-Dichlorobenzidine	420.	U	410.	U			
56-55-3	Benzo(a)anthracene	420.	U	140.	J			
218-01-9	Chrysene	53.	J	240.	J			
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	420.	U	74.	J			
117-84-0	Di-n-octylphthalate	420.	U	410.	U			
205-99-2	Benzo(b)fluoranthene	77.	J	400.	J			
207-08-9	Benzo(k)fluoranthene	60.	J	330.	J			
50-32-8	Benzo(a)pyrene	58.	J	320.	J			
193-39-5	Indeno(1,2,3-cd)pyrene	48.	J	290.	J			
53-70-3	Dibenz(a,h)anthracene	420.	U	110.	J			
191-24-2	Benzo(g,h,i)perylene	61.	J	40.				

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 22 TPH in Surface Soil

TPH							
	SAMPLE ID ------->	022-S-GB03-01	022-S-GB04-01				
	ORIGINAL ID ----->	022SGB0301	022SGB0401				
	LAB SAMPLE ID --->	155797	155909				
	ID FROM REPORT -->	022SGB0301	022SGB0401				
	SAMPLE DATE ----->	10/17/96	10/18/96				
	DATE EXTRACTED -->		11/01/96				
	DATE ANALYZED --->	11/01/96	11/06/96				
	MATRIX ---------->	Soil	Soil				
	UNITS ---------->	MG/KG	MG/KG				
CAS #	Parameter	2045 VAL	2056 VAL				
9999900-02-4	Petroleum Hydrocarbons, TPH	380.	81. U				

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 22 TPH in Surface Soil

TPH-DRO								
	SAMPLE ID ------->	022-S-GB03-01		022-S-GB04-01				
	ORIGINAL ID ----->	022SGB0301		022SGB0401				
	LAB SAMPLE ID --->	155797		155909				
	ID FROM REPORT -->	022SGB0301		022SGB0401				
	SAMPLE DATE ----->	10/17/96		10/18/96				
	DATE EXTRACTED -->	10/22/96		10/30/96				
	DATE ANALYZED --->	10/30/96		10/30/96				
	MATRIX ---------->	Soil		Soil				
	UNITS ---------->	UG/KG		UG/KG				
CAS #	Parameter	2045	VAL	2056	VAL			
9999900-02-6	Diesel Range Organics	340000.	D	41000.				

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 22 TPH in Surface Soil

TPH-GRO								
	SAMPLE ID ------->	022-S-GB03-01		022-S-GB04-01				
	ORIGINAL ID ----->	022SGB0301		022SGB0401				
	LAB SAMPLE ID --->	155797		155909				
	ID FROM REPORT -->	022SGB0301		022SGB0401				
	SAMPLE DATE ----->	10/17/96		10/18/96				
	DATE ANALYZED --->	10/24/96		10/25/96				
	MATRIX ---------->	Soil		Soil				
	UNITS ---------->	UG/KG		UG/KG				
CAS #	Parameter	2045	VAL	2056	VAL			
9999900-02-5	Gasoline Range Organics	310000.	J	77.	U			

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 22 VOCs in Surface Soil

SW846-VOA								
	SAMPLE ID ------->	022-S-GB03-01		022-S-GB04-01				
	ORIGINAL ID ----->	022SGB0301		022SGB0401				
	LAB SAMPLE ID --->	155797		155909				
	ID FROM REPORT -->	022SGB0301		022sgb0401				
	SAMPLE DATE ----->	10/17/96		10/18/96				
	DATE ANALYZED --->	10/23/96		10/23/96				
	MATRIX ---------->	Soil		Soil				
	UNITS ---------->	ug/Kg		ug/Kg				
CAS #	Parameter	2045	VAL	2056	VAL			
74-87-3	Chloromethane	12.	U	12.	U			
74-83-9	Bromomethane	12.	U	12.	U			
75-01-4	Vinyl chloride	12.	U	12.	U			
75-00-3	Chloroethane	12.	U	12.	U			
75-09-2	Methylene chloride	12.	U	12.	U			
67-64-1	Acetone	76.		31.				
75-15-0	Carbon disulfide	12.	U	12.	U			
75-35-4	1,1-Dichloroethene	12.	U	12.	U			
75-34-3	1,1-Dichloroethane	12.	U	12.	U			
540-59-0	1,2-Dichloroethene (total)	12.	U	12.	U			
67-66-3	Chloroform	12.	U	12.	U			
107-06-2	1,2-Dichloroethane	12.	U	12.	U			
78-93-3	2-Butanone (MEK)	12.	U	12.	U			
71-55-6	1,1,1-Trichloroethane	12.	U	12.	U			
56-23-5	Carbon tetrachloride	12.	U	12.	U			
75-27-4	Bromodichloromethane	12.	U	12.	U			
78-87-5	1,2-Dichloropropane	12.	U	12.	U			
10061-01-5	cis-1,3-Dichloropropene	12.	U	12.	U			
79-01-6	Trichloroethene	12.	U	12.	U			
124-48-1	Dibromochloromethane	12.	U	12.	U			
79-00-5	1,1,2-Trichloroethane	12.	U	12.	U			
71-43-2	Benzene	12.	U	12.	U			
10061-02-6	trans-1,3-Dichloropropene	12.	U	12.	U			
75-25-2	Bromoform	12.	U	12.	U			
108-10-1	4-Methyl-2-Pentanone (MIBK)	12.	U	12.	U			
591-78-6	2-Hexanone	12.	U	12.	U			
127-18-4	Tetrachloroethene	12.	U	12.	U			
79-34-5	1,1,2,2-Tetrachloroethane	12.	U	12.	U			
108-88-3	Toluene	12.	U	12.	U			
108-90-7	Chlorobenzene	12.	U	12.	U			
100-41-4	Ethylbenzene	12.	U	12.	U			
100-42-5	Styrene	12.	U	12.	U			
1330-20-7	Xylene (Total)	12.	U	12.	U			

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 22 VOCs in Groundwater

SW846-VOA

SAMPLE ID -------->	022-G-GB10-47
ORIGINAL ID ----->	022GGB1047
LAB SAMPLE ID --->	158165
ID FROM REPORT -->	022GGB1047
SAMPLE DATE ----->	11/26/96
DATE ANALYZED --->	12/06/96
MATRIX ---------->	Water
UNITS ---------->	ug/L

CAS #	Parameter	2105	VAL
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene chloride	10.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon disulfide	10.	U
75-35-4	1,1-Dichloroethene	10.	U
75-34-3	1,1-Dichloroethane	10.	U
540-59-0	1,2-Dichloroethene (total)	10.	U
67-66-3	Chloroform	10.	U
107-06-2	1,2-Dichloroethane	10.	U
78-93-3	2-Butanone (MEK)	10.	U
71-55-6	1,1,1-Trichloroethane	10.	U
56-23-5	Carbon tetrachloride	10.	U
75-27-4	Bromodichloromethane	10.	U
78-87-5	1,2-Dichloropropane	10.	U
10061-01-5	cis-1,3-Dichloropropene	10.	U
79-01-6	Trichloroethene	10.	U
124-48-1	Dibromochloromethane	10.	U
79-00-5	1,1,2-Trichloroethane	10.	U
71-43-2	Benzene	10.	U
10061-02-6	trans-1,3-Dichloropropene	10.	U
75-25-2	Bromoform	10.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	10.	U
79-34-5	1,1,2,2-Tetrachloroethane	10.	U
108-88-3	Toluene	10.	U
108-90-7	Chlorobenzene	10.	U
100-41-4	Ethylbenzene	10.	U
100-42-5	Styrene	10.	U
1330-20-7	Xylene (Total)	10.	U

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 22 VOCs in Groundwater

SW846-VOA															
	SAMPLE ID ------->	022-G-GB01-45		022-G-GB02-47		022-G-GB03-47		022-H-GB03-47		022-G-GB04-47		022-H-GB04-47	
	ORIGINAL ID ----->	022GGB0145		022GGB0247		022GGB0347		022CGB0347		022GGB0447		022HGB0447	
	LAB SAMPLE ID --->	022G0145		022G0247		022G0347		022C0347		022G0447		022H0447	
	ID FROM REPORT -->	022GGB0145		022GGB0247		022GGB0347		022CGB0347		022GGB0447		022HGB0447	
	SAMPLE DATE ----->	10/25/96		10/24/96		10/18/96		10/18/96		10/21/96		10/21/96	
	DATE ANALYZED --->	10/28/96		10/24/96		10/18/96		10/18/96		10/21/96		10/21/96	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
CAS #	Parameter	1	VAL	1	VAL	1	VAL	1	VAL	1	VAL	1	VAL
74-87-3	Chloromethane	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ
74-83-9	Bromomethane	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
75-01-4	Vinyl chloride	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-09-2	Methylene chloride	10.	U	10.	U	19.	U	11.	U	13.	U	12.	U
67-64-1	Acetone	100.	U	100.	UJ	100.	U	100.	U	100.	U	100.	U
75-15-0	Carbon disulfide	10.	U	10.	U	10.	UJ	10.	UJ	10.	UJ	10.	UJ
75-35-4	1,1-Dichloroethene	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-34-3	1,1-Dichloroethane	10.	U	10.	UJ	10.	UJ	10.	UJ	10.	U	10.	U
540-59-0	1,2-Dichloroethene (total)	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
67-66-3	Chloroform	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
107-06-2	1,2-Dichloroethane	10.	UJ	10.	U	10.	U	10.	U	10.	UJ	10.	UJ
78-93-3	2-Butanone (MEK)	50.	U	50.	U	50.	UJ	50.	UJ	50.	U	50.	U
71-55-6	1,1,1-Trichloroethane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
56-23-5	Carbon tetrachloride	10.	UJ	10.	UJ	10.	U	10.	U	10.	UJ	10.	UJ
75-27-4	Bromodichloromethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
78-87-5	1,2-Dichloropropane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
10061-01-5	cis-1,3-Dichloropropene	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
79-01-6	Trichloroethene	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
124-48-1	Dibromochloromethane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
79-00-5	1,1,2-Trichloroethane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
71-43-2	Benzene	10.	UJ	10.	UJ	10.	U	10.	U	10.	UJ	10.	UJ
10061-02-6	trans-1,3-Dichloropropene	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-25-2	Bromoform	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ
108-10-1	4-Methyl-2-Pentanone (MIBK)	50.	UJ	50.	U	50.	U	50.	U	50.	U	50.	U
591-78-6	2-Hexanone	50.	U	50.	U	50.	U	50.	U	50.	U	50.	U
127-18-4	Tetrachloroethene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
79-34-5	1,1,2,2-Tetrachloroethane	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ
108-88-3	Toluene	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
108-90-7	Chlorobenzene	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
100-41-4	Ethylbenzene	10.	U	10.	U	35.	J	49.	J	10.	U	10.	U
100-42-5	Styrene	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-71-8	Dichlorodifluoromethane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-69-4	Trichlorofluoromethane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
142-28-9	1,3-Dichloropropane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
108-38-3	m-Xylene	20.	UJ	20.	U	50.	J	54.	J	20.	UJ	20.	UJ
95-47-6	o-Xylene	10.	UJ	10.	U	10.	UJ	10.	UJ	10.	UJ	10.	UJ

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 22 VOCs in Groundwater

SW846-VOA										
	SAMPLE ID ------->	022-G-GB08-47		022-G-GB09-47		022-G-GB10-47				
	ORIGINAL ID ----->	022GGB0847		022GGB0947		022GGB1047				
	LAB SAMPLE ID --->	9611760-05		9611855-01		9611855-02				
	ID FROM REPORT -->	022GGB0847		022GGB0947		022GGB1047				
	SAMPLE DATE ----->	11/25/96		11/26/96		11/26/96				
	DATE ANALYZED --->	12/06/96		12/09/96		12/09/96				
	MATRIX ---------->	Water		Water		Water				
	UNITS ---------->	ug/L		ug/L		ug/L				
CAS #	Parameter	9611760	VAL	9611855	VAL	9611855	VAL			
67-64-1	Acetone	100.	U	100.	U	100.	U			
107-02-8	Acrolein	50.	U	50.	U	50.	U			
107-13-1	Acrylonitrile	50.	U	50.	U	50.	U			
71-43-2	Benzene	5.	U	5.	U	5.	U			
75-27-4	Bromodichloromethane	5.	U	5.	U	5.	U			
75-25-2	Bromoform	5.	U	5.	U	5.	U			
74-83-9	Bromomethane	5.	U	5.	U	5.	U			
75-15-0	Carbon disulfide	50.	U	5.	U	5.	U			
56-23-5	Carbon tetrachloride	5.	U	5.	U	5.	U			
108-90-7	Chlorobenzene	5.	U	5.	U	5.	U			
124-48-1	Dibromochloromethane	5.	U	5.	U	5.	U			
75-00-3	Chloroethane	5.	U	5.	U	5.	U			
110-75-8	2-Chloroethylvinylether	50.	U	50.	U	50.	U			
67-66-3	Chloroform	5.	U	5.	U	5.	U			
74-87-3	Chloromethane	10.	U	10.	U	10.	U			
74-95-3	Dibromomethane	5.	U	5.	U	5.	U			
764-41-0	1,4-Dichloro-2-butene	10.	U	10.	U	10.	U			
75-71-8	Dichlorodifluoromethane	5.	U	5.	U	5.	U			
95-50-1	1,2-Dichlorobenzene	5.	U	5.	U	5.	U			
541-73-1	1,3-Dichlorobenzene	5.	U	5.	U	5.	U			
106-46-7	1,4-Dichlorobenzene	5.	U	5.	U	5.	U			
75-34-3	1,1-Dichloroethane	5.	U	5.	U	5.	U			
107-06-2	1,2-Dichloroethane	5.	U	5.	U	5.	U			
75-35-4	1,1-Dichloroethene	5.	U	5.	U	5.	U			
156-60-5	trans-1,2-Dichloroethene	5.	U	5.	U	5.	U			
78-87-5	1,2-Dichloropropane	5.	U	5.	U	5.	U			
10061-01-5	cis-1,3-Dichloropropene	5.	U	5.	U	5.	U			
10061-02-6	trans-1,3-Dichloropropene	5.	U	5.	U	5.	U			
100-41-4	Ethylbenzene	5.	U	5.	U	5.	U			
97-63-2	Ethyl methacrylate	50.	U	50.	U	50.	U			
591-78-6	2-Hexanone	50.	U	50.	U	50.	U			
74-88-4	Methyl iodide	20.	U	20.	U	20.	U			
108-10-1	4-Methyl-2-Pentanone (MIBK)	50.	U	50.	U	50.	U			
78-93-3	2-Butanone (MEK)	50.	U	50.	U	50.	U			
75-09-2	Methylene chloride	50.	U	50.	U	50.	U			
1634-04-4	Methyl tert-butyl ether	10.	U	50.	U	10.	U			
100-42-5	Styrene	5.	U	5.	U	5.	U			

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 22 VOCs in Groundwater

SW846-VOA											
	SAMPLE ID ------->	022-G-GB08-47		022-G-GB09-47		022-G-GB10-47					
	ORIGINAL ID ----->	022GGB0847		022GGB0947		022GGB1047					
	LAB SAMPLE ID --->	9611760-05		9611855-01		9611855-02					
	ID FROM REPORT -->	022GGB0847		022GGB0947		022GGB1047					
	SAMPLE DATE ----->	11/25/96		11/26/96		11/26/96					
	DATE ANALYZED --->	12/06/96		12/09/96		12/09/96					
	MATRIX ---------->	Water		Water		Water					
	UNITS ---------->	ug/L		ug/L		ug/L					
CAS #	Parameter	9611760	VAL	9611855	VAL	9611855	VAL				
79-34-5	1,1,2,2-Tetrachloroethane	5.	U	5.	U	5.	U				
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U				
108-88-3	Toluene	5.	U	5.	U	5.	U				
71-55-6	1,1,1-Trichloroethane	5.	U	5.	U	5.	U				
79-00-5	1,1,2-Trichloroethane	5.	U	5.	U	5.	U				
79-01-6	Trichloroethene	5.	U	5.	U	5.	U				
75-69-4	Trichlorofluoromethane	5.	U	5.	U	5.	U				
96-18-4	1,2,3-Trichloropropane	5.	U	5.	U	5.	U				
108-05-4	Vinyl acetate	50.	U	50.	U	50.	U				
75-01-4	Vinyl chloride	5.	U	5.	U	5.	U				
1330-20-7	Xylene (Total)	5.	U	5.	U	5.	U				
156-59-2	cis-1,2-Dichloroethene	5.	U	5.	U	5.	U				

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 TPH in Surface Soil

TPH							
	SAMPLE ID ------->	039-S-GB01-01	039-S-GB02-01				
	ORIGINAL ID ----->	039SGB0101	039SGB0201				
	LAB SAMPLE ID --->	155223	155224				
	ID FROM REPORT -->	039SGB0101	039SGB0201				
	SAMPLE DATE ----->	10/07/96	10/07/96				
	DATE EXTRACTED -->	10/18/96	10/18/96				
	DATE ANALYZED --->	10/31/96	10/31/96				
	MATRIX ---------->	Soil	Soil				
	UNITS ---------->	MG/KG	MG/KG				
CAS #	Parameter	2035 VAL	2035 VAL				
9999900-02-4	Petroleum Hydrocarbons, TPH	740.	240.				

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 TPH in Surface Soil

TPH-DRO							
	SAMPLE ID ------->	039-S-GB01-01	039-S-GB02-01				
	ORIGINAL ID ----->	039SGB0101	039SGB0201				
	LAB SAMPLE ID --->	155223	155224				
	ID FROM REPORT -->	039SGB0101	039SGB0201				
	SAMPLE DATE ----->	10/07/96	10/07/96				
	DATE EXTRACTED -->	10/09/96	10/09/96				
	DATE ANALYZED --->	10/14/96	10/14/96				
	MATRIX ---------->	Soil	Soil				
	UNITS ---------->	UG/KG	UG/KG				
CAS #	Parameter	2035 VAL	2035 VAL				
9999900-02-6	Diesel Range Organics	120000.	95000.				

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 TPH in Surface Soil

TPH-GRO								
	SAMPLE ID ------->	039-S-GB01-01		039-S-GB02-01				
	ORIGINAL ID ----->	039SGB0101		039SGB0201				
	LAB SAMPLE ID --->	155223		155224				
	ID FROM REPORT -->	039SGB0101		039SGB0201				
	SAMPLE DATE ----->	10/07/96		10/07/96				
	DATE ANALYZED --->	10/10/96		10/10/96				
	MATRIX ---------->	Soil		Soil				
	UNITS ---------->	UG/KG		UG/KG				
CAS #	Parameter	2035	VAL	2035	VAL			
9999900-02-5	Gasoline Range Organics	71.	U	61.	U			

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, RFI, ASSEMBLY F
SWMU 39 VOCs in Subsurface Soil

SW846-VOA								
	SAMPLE ID ------->	039-S-0023-11		039-S-0023-13				
	ORIGINAL ID ----->	039S002311		039S002313				
	LAB SAMPLE ID --->	S883329*1		S883329*2				
	ID FROM REPORT -->	039S002311		039S002313				
	SAMPLE DATE ----->	06/08/98		06/08/98				
	DATE ANALYZED --->	06/20/98		06/20/98				
	MATRIX ---------->	Soil		Soil				
	UNITS ---------->	UG/KG		UG/KG				
CAS #	Parameter	MEM53	VAL	MEM53	VAL			
74-87-3	Chloromethane	620.	U	620.	U			
74-83-9	Bromomethane	620.	U	620.	U			
75-01-4	Vinyl chloride	620.	U	620.	U			
75-00-3	Chloroethane	620.	U	620.	U			
75-35-4	1,1-Dichloroethene	320.	U	320.	U			
75-09-2	Methylene chloride	320.	U	150.	U			
75-34-3	1,1-Dichloroethane	320.	U	320.	U			
67-66-3	Chloroform	320.	U	320.	U			
71-55-6	1,1,1-Trichloroethane	320.	U	320.	U			
56-23-5	Carbon tetrachloride	320.	U	320.	U			
71-43-2	Benzene	320.	U	320.	U			
107-06-2	1,2-Dichloroethane	320.	U	320.	U			
79-01-6	Trichloroethene	320.	U	320.	U			
78-87-5	1,2-Dichloropropane	320.	U	320.	U			
75-27-4	Bromodichloromethane	320.	U	320.	U			
108-88-3	Toluene	320.	U	320.	U			
79-00-5	1,1,2-Trichloroethane	320.	U	320.	U			
127-18-4	Tetrachloroethene	320.	U	320.	U			
124-48-1	Dibromochloromethane	320.	U	320.	U			
108-90-7	Chlorobenzene	320.	U	320.	U			
100-41-4	Ethylbenzene	390.		320.	U			
100-42-5	Styrene	320.	U	320.	U			
75-25-2	Bromoform	320.	U	320.	U			
79-34-5	1,1,2,2-Tetrachloroethane	320.	U	320.	U			
67-64-1	Acetone	480.	J	3200.	U			
75-15-0	Carbon disulfide	320.	U	320.	U			
78-93-3	2-Butanone (MEK)	1600.	U	1600.	U			
108-10-1	4-Methyl-2-Pentanone (MIBK)	1600.	U	1600.	U			
10061-01-5	cis-1,3-Dichloropropene	320.	U	320.	U			
10061-02-6	trans-1,3-Dichloropropene	320.	U	320.	U			
591-78-6	2-Hexanone	1600.	U	1600.	U			
1330-20-7	Xylene (Total)	2800.		330.				
540-59-0	1,2-Dichloroethene (total)	320.	U	320.	U			
9999000-44-2	XYLENES	NR		NR				
156-60-5	trans-1,2-Dichloroethene	NR		NR				
156-59-2	cis-1,2-Dichloroethene	NR		NR				

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 Pesticides in Subsurface Soil

SW846-PCB													
	SAMPLE ID ------->	039-S-GB01-02		039-S-GB01-13		039-S-GB02-02		039-S-GB02-11		039-S-GB03-02		039-S-GB03-13	
	ORIGINAL ID ----->	039SGB0102		039SGB0113		039SGB0202		039SGB0211		039SGB0302		039SGB0313	
	LAB SAMPLE ID --->	155286		155656		155287		155799		155289		155800	
	ID FROM REPORT -->	039SGB0102		039SGB0113		039SGB0202		039SGB0211		039SGB0302		039SGB0313	
	SAMPLE DATE ----->	10/08/96		10/15/96		10/08/96		10/17/96		10/08/96		10/17/96	
	DATE EXTRACTED -->	10/12/96		10/23/96		10/12/96		10/23/96		10/12/96		10/23/96	
	DATE ANALYZED --->	10/16/96		10/25/96		10/16/96		10/25/96		10/16/96		10/25/96	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
CAS #	Parameter	2037	VAL	2045	VAL	2037	VAL	2045	VAL	2037	VAL	2045	VAL
12674-11-2	Aroclor-1016	42.	U	43.	U	39.	U	43.	U	39.	U	43.	U
11104-28-2	Aroclor-1221	42.	U	43.	U	39.	U	43.	U	39.	U	43.	U
11141-16-5	Aroclor-1232	42.	U	43.	U	39.	U	43.	U	39.	U	43.	U
53469-21-9	Aroclor-1242	42.	U	43.	U	39.	U	43.	U	39.	U	43.	U
12672-29-6	Aroclor-1248	42.	U	43.	U	39.	U	43.	U	39.	U	43.	U
11097-69-1	Aroclor-1254	42.	U	43.	U	39.	U	43.	U	39.	U	43.	U
11096-82-5	Aroclor-1260	42.	U	43.	U	39.	U	43.	U	39.	U	43.	U

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 Pesticides in Subsurface Soil

SW846-PCB												
	SAMPLE ID ------->	039-C-GB03-13		039-S-GB04-02		039-S-GB04-13		039-S-GB05-02		039-S-GB05-13		
	ORIGINAL ID ----->	039CGB0313		039SGB0402		039SGB0413		039SGB0502		039SGB0513		
	LAB SAMPLE ID --->	155798		155290		155801		155293		155786		
	ID FROM REPORT -->	039CGB0313		039SGB0402		039SGB0413		039SGB0502		039SGB0513		
	SAMPLE DATE ----->	10/17/96		10/08/96		10/17/96		10/08/96		10/16/96		
	DATE EXTRACTED -->	10/23/96		10/12/96		10/23/96		10/12/96		10/23/96		
	DATE ANALYZED --->	10/25/96		10/16/96		10/25/96		10/17/96		10/25/96		
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		
	UNITS ---------->	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		
CAS #	Parameter	2045	VAL	2037	VAL	2045	VAL	2037	VAL	2045	VAL	
12674-11-2	Aroclor-1016	43.	U	40.	U	43.	U	43.	U	43.	U	
11104-28-2	Aroclor-1221	43.	U	40.	U	43.	U	43.	U	43.	U	
11141-16-5	Aroclor-1232	43.	U	40.	U	43.	U	43.	U	43.	U	
53469-21-9	Aroclor-1242	43.	U	40.	U	43.	U	43.	U	43.	U	
12672-29-6	Aroclor-1248	43.	U	40.	U	43.	U	43.	U	43.	U	
11097-69-1	Aroclor-1254	43.	U	40.	U	43.	U	43.	U	43.	U	
11096-82-5	Aroclor-1260	43.	U	40.	U	43.	U	43.	U	43.	U	

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 VOCs in Subsurface Soil

SW846-VOA															
	SAMPLE ID ------->	039-S-GB04-13		039-S-GB05-02		039-S-GB06-10		039-S-GB07-13		039-S-GB08-17		039-S-GB09-13	
	ORIGINAL ID ----->	039SGB0413		039SGB0502		039SGB0610		039SGB0713		039SGB0817		039SGB0913	
	LAB SAMPLE ID --->	155801		155293		158160		158161		158162		158163	
	ID FROM REPORT -->	039SGB0413		039sgb0502		039SGB0610		039SGB0713		039SGB0817		039SGB0913	
	SAMPLE DATE ----->			10/08/96		11/26/96		11/26/96		11/26/96		11/26/96	
	DATE ANALYZED --->	10/23/96		10/10/96		12/06/96		12/04/96		12/05/96		12/04/96	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
CAS #	Parameter	2045	VAL	2037	VAL	2105	VAL	2105	VAL	2105	VAL	2105	VAL
74-87-3	Chloromethane	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
74-83-9	Bromomethane	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
75-01-4	Vinyl chloride	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
75-00-3	Chloroethane	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
75-09-2	Methylene chloride	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
67-64-1	Acetone	13.	U	13.	U	1600.	U	26.		39.	J	13.	U
75-15-0	Carbon disulfide	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
75-35-4	1,1-Dichloroethene	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
75-34-3	1,1-Dichloroethane	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
540-59-0	1,2-Dichloroethene (total)	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
67-66-3	Chloroform	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
107-06-2	1,2-Dichloroethane	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
78-93-3	2-Butanone (MEK)	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
71-55-6	1,1,1-Trichloroethane	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
56-23-5	Carbon tetrachloride	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
75-27-4	Bromodichloromethane	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
78-87-5	1,2-Dichloropropane	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
10061-01-5	cis-1,3-Dichloropropene	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
79-01-6	Trichloroethene	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
124-48-1	Dibromochloromethane	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
79-00-5	1,1,2-Trichloroethane	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
71-43-2	Benzene	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
10061-02-6	trans-1,3-Dichloropropene	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
75-25-2	Bromoform	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	13.	U	13.	U	1600.	U	13.	U	13.	UJ	13.	U
591-78-6	2-Hexanone	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
127-18-4	Tetrachloroethene	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
79-34-5	1,1,2,2-Tetrachloroethane	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
108-88-3	Toluene	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
108-90-7	Chlorobenzene	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
100-41-4	Ethylbenzene	13.	U	13.	U	1600.	U	10.	J	13.	U	13.	U
100-42-5	Styrene	13.	U	13.	U	1600.	U	13.	U	13.	U	13.	U
1330-20-7	Xylene (Total)	13.	U	13.	U	1600.	U	2.	J	14.		13.	U

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 VOCs in Subsurface Soil

SW846-VOA

SAMPLE ID ------->	039-S-GB09-17
ORIGINAL ID ----->	039SGB0917
LAB SAMPLE ID --->	158164
ID FROM REPORT -->	039SGB0917
SAMPLE DATE ----->	11/26/96
DATE ANALYZED --->	12/04/96
MATRIX ---------->	Soil
UNITS ----------->	ug/Kg

CAS #	Parameter	2105	VAL
74-87-3	Chloromethane	13.	U
74-83-9	Bromomethane	13.	U
75-01-4	Vinyl chloride	13.	U
75-00-3	Chloroethane	13.	U
75-09-2	Methylene chloride	13.	U
67-64-1	Acetone	25.	
75-15-0	Carbon disulfide	13.	U
75-35-4	1,1-Dichloroethene	13.	U
75-34-3	1,1-Dichloroethane	13.	U
540-59-0	1,2-Dichloroethene (total)	13.	U
67-66-3	Chloroform	13.	U
107-06-2	1,2-Dichloroethane	13.	U
78-93-3	2-Butanone (MEK)	13.	U
71-55-6	1,1,1-Trichloroethane	13.	U
56-23-5	Carbon tetrachloride	13.	U
75-27-4	Bromodichloromethane	13.	U
78-87-5	1,2-Dichloropropane	13.	U
10061-01-5	cis-1,3-Dichloropropene	13.	U
79-01-6	Trichloroethene	13.	U
124-48-1	Dibromochloromethane	13.	U
79-00-5	1,1,2-Trichloroethane	13.	U
71-43-2	Benzene	13.	U
10061-02-6	trans-1,3-Dichloropropene	13.	U
75-25-2	Bromoform	13.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	13.	U
591-78-6	2-Hexanone	13.	U
127-18-4	Tetrachloroethene	13.	U
79-34-5	1,1,2,2-Tetrachloroethane	13.	U
108-88-3	Toluene	13.	U
108-90-7	Chlorobenzene	13.	U
100-41-4	Ethylbenzene	13.	U
100-42-5	Styrene	13.	U
1330-20-7	Xylene (Total)	13.	U

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 VOCs in Subsurface Soil

SW846-VOA													
	SAMPLE ID ------->	039-S-GB01-02		039-S-GB01-13		039-S-GB02-02		039-C-GB03-02		039-S-GB03-02		039-C-GB03-13	
	ORIGINAL ID ----->	039SGB0102		039SGB0113		039SGB0202		039CGB0302		039SGB0302		039CGB0313	
	LAB SAMPLE ID --->	039S0102		039S0113		039S0202		039C0302		039S0302		039C0313	
	ID FROM REPORT -->	039SGB0102		039SGB0113		039SGB0202		039CGB0302		039SGB0302		039CGB0313	
	SAMPLE DATE ----->	10/08/96		10/15/96		10/08/96		10/08/96		10/08/96		10/17/96	
	DATE ANALYZED --->	10/17/96		10/16/96		10/10/96		10/10/96		10/16/96		10/17/96	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	ug/KG		ug/KG		ug/KG		ug/KG		ug/KG		ug/KG	
CAS #	Parameter	1	VAL	1	VAL	1	VAL	1	VAL	1	VAL	1	VAL
74-87-3	Chloromethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
74-83-9	Bromomethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
75-01-4	Vinyl chloride	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	UJ
75-09-2	Methylene chloride	310.	DJ	10.	U	10.	U	10.	U	10.	U	10.	U
67-64-1	Acetone	100.	UJ	100.	U	100.	UJ	100.	UJ	100.	U	100.	U
75-15-0	Carbon disulfide	10.	UJ	10.	U	10.	U	10.	UJ	39.	J	27.	
75-35-4	1,1-Dichloroethene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
75-34-3	1,1-Dichloroethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
540-59-0	1,2-Dichloroethene (total)	20.	UJ	10.	U	20.	U	20.	U	10.	U	10.	U
67-66-3	Chloroform	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
107-06-2	1,2-Dichloroethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
78-93-3	2-Butanone (MEK)	50.	UJ	50.	U	50.	UJ	50.	UJ	50.	U	50.	U
71-55-6	1,1,1-Trichloroethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
56-23-5	Carbon tetrachloride	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
75-27-4	Bromodichloromethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
78-87-5	1,2-Dichloropropane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
10061-01-5	cis-1,3-Dichloropropene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
79-01-6	Trichloroethene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
124-48-1	Dibromochloromethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
79-00-5	1,1,2-Trichloroethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
71-43-2	Benzene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	UJ
10061-02-6	trans-1,3-Dichloropropene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
75-25-2	Bromoform	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ
108-10-1	4-Methyl-2-Pentanone (MIBK)	50.	UJ	50.	U	50.	UJ	50.	UJ	50.	U	50.	U
591-78-6	2-Hexanone	50.	UJ	50.	U	50.	UJ	50.	UJ	50.	U	50.	U
127-18-4	Tetrachloroethene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
79-34-5	1,1,2,2-Tetrachloroethane	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ	230.	J
108-88-3	Toluene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
108-90-7	Chlorobenzene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
100-41-4	Ethylbenzene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
100-42-5	Styrene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
75-71-8	Dichlorodifluoromethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
75-69-4	Trichlorofluoromethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
142-28-9	1,3-Dichloropropane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
108-38-3	m-Xylene	20.	UJ	20.	U	20.	U	20.	U	20.	U	20.	UJ
95-47-6	o-Xylene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	UJ

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 VOCs in Subsurface Soil

SW846-VOA											
	SAMPLE ID ------->	039-S-GB03-13		039-S-GB04-02		039-S-GB04-13		039-S-GB05-02		039-S-GB05-13	
	ORIGINAL ID ----->	039SGB0313		039SGB0402		039SGB0413		039SGB0502		039SGB0513	
	LAB SAMPLE ID --->	039S0313		039S0402		039S0413		039S0502		039S0513	
	ID FROM REPORT -->	039SGB0313		039SGB0402		039SGB0413		039SGB0502		039SGB0513	
	SAMPLE DATE ----->	10/17/96		10/08/96		10/17/96		10/08/96		10/16/96	
	DATE ANALYZED --->	10/17/96		10/16/96		10/19/96		10/17/96		10/16/96	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	ug/KG		ug/KG		ug/KG		ug/KG		ug/KG	
CAS #	Parameter	1	VAL	1	VAL	1	VAL	1	VAL	1	VAL
74-87-3	Chloromethane	10.	U	10.	UJ	10.	UJ	10.	U	10.	U
74-83-9	Bromomethane	10.	U	10.	UJ	10.	U	10.	U	10.	U
75-01-4	Vinyl chloride	10.	UJ	10.	UJ	10.	U	10.	UJ	10.	U
75-09-2	Methylene chloride	10.	U	150.	J	70.	U	290.	J	16.	
67-64-1	Acetone	100.	U	100.	UJ	100.	U	100.	U	100.	U
75-15-0	Carbon disulfide	28.	J	10.	UJ	10.	UJ	10.	U	10.	U
75-35-4	1,1-Dichloroethene	10.	U	10.	UJ	10.	U	10.	U	10.	U
75-34-3	1,1-Dichloroethane	10.	U	10.	UJ	10.	U	10.	U	10.	U
540-59-0	1,2-Dichloroethene (total)	10.	U	10.	UJ	10.	U	10.	U	10.	U
67-66-3	Chloroform	10.	U	10.	UJ	10.	U	10.	U	10.	U
107-06-2	1,2-Dichloroethane	10.	U	10.	UJ	10.	UJ	10.	U	10.	U
78-93-3	2-Butanone (MEK)	50.	U	50.	UJ	50.	U	50.	U	50.	U
71-55-6	1,1,1-Trichloroethane	10.	U	10.	UJ	10.	U	10.	U	10.	U
56-23-5	Carbon tetrachloride	10.	U	10.	UJ	10.	UJ	10.	U	10.	U
75-27-4	Bromodichloromethane	10.	U	10.	UJ	10.	U	10.	U	10.	U
78-87-5	1,2-Dichloropropane	10.	U	10.	UJ	10.	U	10.	U	10.	U
10061-01-5	cis-1,3-Dichloropropene	10.	U	10.	UJ	10.	U	10.	U	10.	U
79-01-6	Trichloroethene	10.	U	10.	UJ	10.	U	10.	U	10.	U
124-48-1	Dibromochloromethane	10.	U	10.	UJ	10.	U	10.	U	10.	U
79-00-5	1,1,2-Trichloroethane	10.	U	10.	UJ	10.	U	10.	U	10.	U
71-43-2	Benzene	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	U
10061-02-6	trans-1,3-Dichloropropene	10.	U	10.	UJ	10.	U	10.	U	10.	U
75-25-2	Bromoform	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ
108-10-1	4-Methyl-2-Pentanone (MIBK)	50.	U	50.	UJ	50.	UJ	50.	U	50.	U
591-78-6	2-Hexanone	50.	U	50.	UJ	50.	UJ	50.	U	50.	U
127-18-4	Tetrachloroethene	10.	U	10.	UJ	10.	U	10.	U	10.	U
79-34-5	1,1,2,2-Tetrachloroethane	150.	J	10.	UJ	10.	UJ	10.	UJ	10.	UJ
108-88-3	Toluene	10.	U	10.	UJ	10.	U	10.	U	10.	U
108-90-7	Chlorobenzene	10.	U	10.	UJ	10.	U	10.	U	10.	U
100-41-4	Ethylbenzene	10.	U	10.	UJ	10.	U	10.	U	10.	U
100-42-5	Styrene	10.	U	10.	UJ	10.	U	10.	U	10.	U
75-71-8	Dichlorodifluoromethane	10.	U	10.	UJ	10.	U	10.	U	10.	U
75-69-4	Trichlorofluoromethane	10.	U	10.	UJ	10.	U	10.	U	10.	U
142-28-9	1,3-Dichloropropane	10.	U	10.	UJ	10.	U	10.	U	10.	U
108-38-3	m-Xylene	20.	UJ	20.	UJ	20.	UJ	20.	UJ	20.	U
95-47-6	o-Xylene	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	U

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 VOCs in Groundwater

SW846-VOA													
	SAMPLE ID ------->	039-S-GB01-02		039-S-GB01-13		039-S-GB02-02		039-S-GB02-11		039-C-GB03-02		039-S-GB03-02	
	ORIGINAL ID ----->	039SGB0102		039SGB0113		039SGB0202		039SGB0211		039CGB0302		039SGB0302	
	LAB SAMPLE ID --->	039S0102		039S0113		039S0202		039S211D		039C0302		039S0302	
	ID FROM REPORT -->	039SGB0102		039SGB0113		039SGB0202		039SGB0211		039CGB0302		039SGB0302	
	SAMPLE DATE ----->	10/08/96		10/15/96		10/08/96		10/17/96		10/08/96		10/08/96	
	DATE ANALYZED --->	10/17/96		10/16/96		10/10/96		10/17/96		10/10/96		10/16/96	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	ug/KG		ug/KG		ug/KG		ug/KG		ug/KG		ug/KG	
CAS #	Parameter	1	VAL	1	VAL	1	VAL	1	VAL	1	VAL	1	VAL
74-87-3	Chloromethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
74-83-9	Bromomethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
75-01-4	Vinyl chloride	10.	UJ	10.	U	10.	U	10.	UJ	10.	U	10.	U
75-09-2	Methylene chloride	310.	DJ	10.	U	10.	U	77000.	DJ	10.	U	10.	U
67-64-1	Acetone	100.	UJ	100.	U	100.	UJ	100.	U	100.	UJ	100.	U
75-15-0	Carbon disulfide	10.	UJ	10.	U	10.	U	10.	U	10.	UJ	39.	J
75-35-4	1,1-Dichloroethene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
75-34-3	1,1-Dichloroethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
540-59-0	1,2-Dichloroethene (total)	20.	UJ	10.	U	20.	U	20.	U	20.	U	10.	U
67-66-3	Chloroform	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
107-06-2	1,2-Dichloroethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
78-93-3	2-Butanone (MEK)	50.	UJ	50.	U	50.	UJ	50.	U	50.	UJ	50.	U
71-55-6	1,1,1-Trichloroethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
56-23-5	Carbon tetrachloride	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
75-27-4	Bromodichloromethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
78-87-5	1,2-Dichloropropane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
10061-01-5	cis-1,3-Dichloropropene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
79-01-6	Trichloroethene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
124-48-1	Dibromochloromethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
79-00-5	1,1,2-Trichloroethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
71-43-2	Benzene	10.	UJ	10.	U	10.	U	10.	UJ	10.	U	10.	U
10061-02-6	trans-1,3-Dichloropropene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
75-25-2	Bromoform	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ
108-10-1	4-Methyl-2-Pentanone (MIBK)	50.	UJ	50.	U	50.	UJ	50.	U	50.	UJ	50.	U
591-78-6	2-Hexanone	50.	UJ	50.	U	50.	UJ	50.	U	50.	UJ	50.	U
127-18-4	Tetrachloroethene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
79-34-5	1,1,2,2-Tetrachloroethane	10.	UJ	10.	UJ	10.	UJ	30000.	DJ	10.	UJ	10.	UJ
108-88-3	Toluene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
108-90-7	Chlorobenzene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
100-41-4	Ethylbenzene	10.	UJ	10.	U	10.	U	18000.	D	10.	U	10.	U
100-42-5	Styrene	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
75-71-8	Dichlorodifluoromethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
75-69-4	Trichlorofluoromethane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
142-28-9	1,3-Dichloropropane	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
108-38-3	m-Xylene	20.	UJ	20.	U	20.	U	110000.	DJ	20.	U	20.	U
95-47-6	o-Xylene	10.	UJ	10.	U	10.	U	56000.	DJ	10.	U	10.	U

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 VOCs in Groundwater

SW846-VOA															
	SAMPLE ID ------->	039-C-GB03-13		039-S-GB03-13		039-S-GB04-02		039-S-GB04-13		039-S-GB05-02		039-S-GB05-13	
	ORIGINAL ID ----->	039CGB0313		039SGB0313		039SGB0402		039SGB0413		039SGB0502		039SGB0513	
	LAB SAMPLE ID --->	039C0313		039S0313		039S0402		039S0413		039S0502		039S0513	
	ID FROM REPORT -->	039CGB0313		039SGB0313		039SGB0402		039SGB0413		039SGB0502		039SGB0513	
	SAMPLE DATE ----->	10/17/96		10/17/96		10/08/96		10/17/96		10/08/96		10/16/96	
	DATE ANALYZED --->	10/17/96		10/17/96		10/16/96		10/19/96		10/17/96		10/16/96	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	ug/KG		ug/KG		ug/KG		ug/KG		ug/KG		ug/KG	
CAS #	Parameter	1	VAL	1	VAL	1	VAL	1	VAL	1	VAL	1	VAL
74-87-3	Chloromethane	10.	U	10.	U	10.	UJ	10.	UJ	10.	U	10.	U
74-83-9	Bromomethane	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
75-01-4	Vinyl chloride	10.	UJ	10.	UJ	10.	UJ	10.	U	10.	UJ	10.	U
75-09-2	Methylene chloride	10.	U	10.	U	150.	J	70.	U	290.	J	16.	
67-64-1	Acetone	100.	U	100.	U	100.	UJ	100.	U	100.	U	100.	U
75-15-0	Carbon disulfide	27.		28.	J	10.	UJ	10.	UJ	10.	U	10.	U
75-35-4	1,1-Dichloroethene	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
75-34-3	1,1-Dichloroethane	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
540-59-0	1,2-Dichloroethene (total)	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
67-66-3	Chloroform	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
107-06-2	1,2-Dichloroethane	10.	U	10.	U	10.	UJ	10.	UJ	10.	U	10.	U
78-93-3	2-Butanone (MEK)	50.	U	50.	U	50.	UJ	50.	U	50.	U	50.	U
71-55-6	1,1,1-Trichloroethane	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
56-23-5	Carbon tetrachloride	10.	U	10.	U	10.	UJ	10.	UJ	10.	U	10.	U
75-27-4	Bromodichloromethane	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
78-87-5	1,2-Dichloropropane	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
10061-01-5	cis-1,3-Dichloropropene	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
79-01-6	Trichloroethene	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
124-48-1	Dibromochloromethane	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
79-00-5	1,1,2-Trichloroethane	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
71-43-2	Benzene	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	U
10061-02-6	trans-1,3-Dichloropropene	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
75-25-2	Bromoform	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ
108-10-1	4-Methyl-2-Pentanone (MIBK)	50.	U	50.	U	50.	UJ	50.	UJ	50.	U	50.	U
591-78-6	2-Hexanone	50.	U	50.	U	50.	UJ	50.	UJ	50.	U	50.	U
127-18-4	Tetrachloroethene	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
79-34-5	1,1,2,2-Tetrachloroethane	230.	J	150.	J	10.	UJ	10.	UJ	10.	UJ	10.	UJ
108-88-3	Toluene	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
108-90-7	Chlorobenzene	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
100-41-4	Ethylbenzene	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
100-42-5	Styrene	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
75-71-8	Dichlorodifluoromethane	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
75-69-4	Trichlorofluoromethane	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
142-28-9	1,3-Dichloropropane	10.	U	10.	U	10.	UJ	10.	U	10.	U	10.	U
108-38-3	m-Xylene	20.	UJ	20.	UJ	20.	UJ	20.	UJ	20.	UJ	20.	U
95-47-6	o-Xylene	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	U

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 VOCs in Groundwater

SW846-VOA													
	SAMPLE ID ------->	039-S-GB06-10		039-S-GB06-13		039-S-GB06-17		039-S-GB07-10		039-S-GB07-13		039-S-GB07-17	
	ORIGINAL ID ----->	039SGB0610		039SGB0613		039SGB0617		039SGB0710		039SGB0713		039SGB0717	
	LAB SAMPLE ID --->	9611855-05		9611855-06		9611855-07		9611855-08		9611855-09		9611855-10	
	ID FROM REPORT -->	039SGB0610		039SGB0613		039SGB0617		039SGB0710		039SGB0713		039SGB0717	
	SAMPLE DATE ----->	11/26/96		11/26/96		11/26/96		11/26/96		11/26/96		11/26/96	
	DATE ANALYZED --->	12/06/96		12/06/96		12/06/96		12/09/96		12/09/96		12/09/96	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	ug/KG		ug/KG		ug/KG		ug/KG		ug/KG		ug/KG	
CAS #	Parameter	9611855	VAL	9611855	VAL	9611855	VAL	9611855	VAL	9611855	VAL	9611855	VAL
67-64-1	Acetone	250.	UD	50.	U	50.	U	10000.	UD	50.	U	50.	U
107-02-8	Acrolein	250.	UD	50.	U	50.	U	10000.	UD	50.	U	50.	U
107-13-1	Acrylonitrile	250.	UD	50.	U	50.	U	10000.	UD	50.	U	50.	U
71-43-2	Benzene	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
75-27-4	Bromodichloromethane	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
75-25-2	Bromoform	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
74-83-9	Bromomethane	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
75-15-0	Carbon disulfide	250.	UD	50.	U	50.	U	10000.	UD	50.	U	50.	U
56-23-5	Carbon tetrachloride	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
108-90-7	Chlorobenzene	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
124-48-1	Dibromochloromethane	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
75-00-3	Chloroethane	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
110-75-8	2-Chloroethylvinylether	250.	UD	50.	U	50.	U	10000.	UD	50.	U	50.	U
67-66-3	Chloroform	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
74-87-3	Chloromethane	50.	UD	10.	U	10.	U	2000.	UD	10.	U	10.	U
74-95-3	Dibromomethane	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
764-41-0	1,4-Dichloro-2-butene	50.	UD	10.	U	10.	U	2000.	UD	10.	U	10.	U
75-71-8	Dichlorodifluoromethane	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
95-50-1	1,2-Dichlorobenzene	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
541-73-1	1,3-Dichlorobenzene	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
106-46-7	1,4-Dichlorobenzene	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
75-34-3	1,1-Dichloroethane	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
107-06-2	1,2-Dichloroethane	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
75-35-4	1,1-Dichloroethene	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
156-60-5	trans-1,2-Dichloroethene	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
78-87-5	1,2-Dichloropropane	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
10061-01-5	cis-1,3-Dichloropropene	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
100-41-4	Ethylbenzene	55.3	D	58.4		24.8		2270.	D	10.8		21.6	
97-63-2	Ethyl methacrylate	250.	UD	50.	U	50.	U	10000.	UD	50.	U	50.	U
591-78-6	2-Hexanone	250.	UD	50.	U	50.	U	10000.	UD	50.	U	50.	U
74-88-4	Methyl iodide	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	250.	UD	50.	U	50.	U	10000.	UD	50.	U	50.	U
78-93-3	2-Butanone (MEK)	250.	UD	50.	U	50.	U	10000.	UD	50.	U	50.	U
75-09-2	Methylene chloride	250.	UD	50.	U	50.	U	10000.	UD	50.	U	50.	U
1634-04-4	Methyl tert-butyl ether	50.	UD	10.	U	10.	U	2000.	UD	10.	U	10.	U
100-42-5	Styrene	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 VOCs in Groundwater

SW846-VOA													
	SAMPLE ID ------->	039-S-GB06-10		039-S-GB06-13		039-S-GB06-17		039-S-GB07-10		039-S-GB07-13		039-S-GB07-17	
	ORIGINAL ID ----->	039SGB0610		039SGB0613		039SGB0617		039SGB0710		039SGB0713		039SGB0717	
	LAB SAMPLE ID --->	9611855-05		9611855-06		9611855-07		9611855-08		9611855-09		9611855-10	
	ID FROM REPORT -->	039SGB0610		039SGB0613		039SGB0617		039SGB0710		039SGB0713		039SGB0717	
	SAMPLE DATE ----->	11/26/96		11/26/96		11/26/96		11/26/96		11/26/96		11/26/96	
	DATE ANALYZED --->	12/06/96		12/06/96		12/06/96		12/09/96		12/09/96		12/09/96	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	ug/KG		ug/KG		ug/KG		ug/KG		ug/KG		ug/KG	
CAS #	Parameter	9611855	VAL	9611855	VAL	9611855	VAL	9611855	VAL	9611855	VAL	9611855	VAL
79-34-5	1,1,2,2-Tetrachloroethane	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
127-18-4	Tetrachloroethene	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
108-88-3	Toluene	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
71-55-6	1,1,1-Trichloroethane	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
79-00-5	1,1,2-Trichloroethane	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
79-01-6	Trichloroethene	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
75-69-4	Trichlorofluoromethane	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
96-18-4	1,2,3-Trichloropropane	25.	UD	5.	U	5.	U	1000.	UD	5.	U	5.	U
108-05-4	Vinyl acetate	250.	UD	50.	U	50.	U	10000.	UD	50.	U	50.	U
75-01-4	Vinyl chloride	50.	UD	10.	U	10.	U	2000.	UD	10.	U	10.	U
1330-20-7	Xylene (Total)	25.	UD	5.	U	33.1		3310.	D	5.	U	30.7	
156-59-2	cis-1,2-Dichloroethene	25.	UD	5.	U	1.9	J	1000.	UD	5.	U	5.2	

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 VOCs in Groundwater

SW846-VOA													
	SAMPLE ID ------->	039-S-GB08-10		039-S-GB08-13		039-S-GB08-17		039-C-GB09-10		039-S-GB09-10		039-S-GB09-13	
	ORIGINAL ID ----->	039SGB0810		039SGB0813		039SGB0817		039CGB0910		039SGB0910		039SGB0913	
	LAB SAMPLE ID --->	9611855-11		9611855-12		9611855-13		9611855-03		9611855-14		9611855-15	
	ID FROM REPORT -->	039SGB0810		039SGB0813		039SGB0817		039CGB0910		039SGB0910		039SGB0913	
	SAMPLE DATE ----->	11/26/96		11/26/96		11/26/96		11/26/96		11/26/96		11/26/96	
	DATE ANALYZED --->	12/09/96		12/10/96		12/10/96		12/06/96		12/10/96		12/10/96	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	ug/KG		ug/KG		ug/KG		ug/KG		ug/KG		ug/KG	
CAS #	Parameter	9611855	VAL	9611855	VAL	9611855	VAL	9611855	VAL	9611855	VAL	9611855	VAL
67-64-1	Acetone	10000.	UD	2500.	UD	5000.	UD	50.	U	50.	U	50.	U
107-02-8	Acrolein	10000.	UD	2500.	UD	5000.	UD	50.	U	50.	U	50.	U
107-13-1	Acrylonitrile	10000.	UD	2500.	UD	5000.	UD	50.	U	50.	U	50.	U
71-43-2	Benzene	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
75-27-4	Bromodichloromethane	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
75-25-2	Bromoform	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
74-83-9	Bromomethane	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
75-15-0	Carbon disulfide	10000.	UD	2500.	UD	5000.	UD	50.	U	50.	U	50.	U
56-23-5	Carbon tetrachloride	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
108-90-7	Chlorobenzene	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
124-48-1	Dibromochloromethane	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
75-00-3	Chloroethane	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
110-75-8	2-Chloroethylvinylether	10000.	UD	2500.	UD	5000.	UD	50.	U	50.	U	50.	U
67-66-3	Chloroform	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
74-87-3	Chloromethane	2000.	UD	250.	UD	1000.	UD	10.	U	10.	U	10.	U
74-95-3	Dibromomethane	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
764-41-0	1,4-Dichloro-2-butene	2000.	UD	250.	UD	1000.	UD	10.	U	10.	U	10.	U
75-71-8	Dichlorodifluoromethane	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
95-50-1	1,2-Dichlorobenzene	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
541-73-1	1,3-Dichlorobenzene	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
106-46-7	1,4-Dichlorobenzene	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
75-34-3	1,1-Dichloroethane	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
107-06-2	1,2-Dichloroethane	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
75-35-4	1,1-Dichloroethene	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
156-60-5	trans-1,2-Dichloroethene	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
78-87-5	1,2-Dichloropropane	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
10061-01-5	cis-1,3-Dichloropropene	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
100-41-4	Ethylbenzene	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	50.	U
97-63-2	Ethyl methacrylate	10000.	UD	2500.	UD	5000.	UD	50.	U	50.	U	50.	U
591-78-6	2-Hexanone	10000.	UD	2500.	UD	5000.	UD	50.	U	50.	U	50.	U
74-88-4	Methyl iodide	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	10000.	UD	2500.	UD	5000.	UD	50.	U	50.	U	50.	U
78-93-3	2-Butanone (MEK)	10000.	UD	2500.	UD	5000.	UD	50.	U	50.	U	50.	U
75-09-2	Methylene chloride	10000.	UD	2500.	UD	5000.	UD	50.	U	50.	U	50.	U
1634-04-4	Methyl tert-butyl ether	2000.	UD	500.	UD	1000.	UD	10.	U	10.	U	10.	U
100-42-5	Styrene	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 VOCs in Groundwater

SW846-VOA													
	SAMPLE ID ------->	039-S-GB08-10		039-S-GB08-13		039-S-GB08-17		039-C-GB09-10		039-S-GB09-10		039-S-GB09-13	
	ORIGINAL ID ----->	039SGB0810		039SGB0813		039SGB0817		039CGB0910		039SGB0910		039SGB0913	
	LAB SAMPLE ID --->	9611855-11		9611855-12		9611855-13		9611855-03		9611855-14		9611855-15	
	ID FROM REPORT -->	039SGB0810		039SGB0813		039SGB0817		039CGB0910		039SGB0910		039SGB0913	
	SAMPLE DATE ----->	11/26/96		11/26/96		11/26/96		11/26/96		11/26/96		11/26/96	
	DATE ANALYZED --->	12/09/96		12/10/96		12/10/96		12/06/96		12/10/96		12/10/96	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	ug/KG		ug/KG		ug/KG		ug/KG		ug/KG		ug/KG	
CAS #	Parameter	9611855	VAL	9611855	VAL	9611855	VAL	9611855	VAL	9611855	VAL	9611855	VAL
79-34-5	1,1,2,2-Tetrachloroethane	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
127-18-4	Tetrachloroethene	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
108-88-3	Toluene	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
71-55-6	1,1,1-Trichloroethane	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
79-00-5	1,1,2-Trichloroethane	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
79-01-6	Trichloroethene	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
75-69-4	Trichlorofluoromethane	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
96-18-4	1,2,3-Trichloropropane	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
108-05-4	Vinyl acetate	10000.	UD	2500.	UD	5000.	UD	50.	U	50.	U	50.	U
75-01-4	Vinyl chloride	2000.	UD	500.	UD	1000.	UD	10.	U	10.	U	10.	U
1330-20-7	Xylene (Total)	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U
156-59-2	cis-1,2-Dichloroethene	1000.	UD	250.	UD	500.	UD	5.	U	5.	U	5.	U

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 VOCs in Groundwater

SW846-VOA											
	SAMPLE ID ------->	039-S-GB09-17		039-C-GB10-10		039-S-GB10-10		039-S-GB10-13		039-S-GB10-17	
	ORIGINAL ID ----->	039SGB0917		039CGB1010		039SGB1010		039SGB1013		039SGB1017	
	LAB SAMPLE ID --->	9611855-16		9611855-04		9611855-17		9611855-18		9611855-19	
	ID FROM REPORT -->	039SGB0917		039CGB1010		039SGB1010		039SGB1013		039SGB1017	
	SAMPLE DATE ----->	11/26/96		11/26/96		11/26/96		11/26/96		11/26/96	
	DATE ANALYZED --->	12/10/96		12/06/96		12/10/96		12/10/96		12/10/96	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	ug/KG		ug/KG		ug/KG		ug/KG		ug/KG	
CAS #	Parameter	9611855	VAL	9611855	VAL	9611855	VAL	9611855	VAL	9611855	VAL
67-64-1	Acetone	5000.	UD	50.	U	50.	U	50.	U	5000.	UD
107-02-8	Acrolein	5000.	UD	50.	U	50.	U	50.	U	5000.	UD
107-13-1	Acrylonitrile	5000.	UD	50.	U	50.	U	50.	U	5000.	UD
71-43-2	Benzene	500.	UD	5.	U	5.	U	5.	U	500.	UD
75-27-4	Bromodichloromethane	500.	UD	5.	U	5.	U	5.	U	500.	UD
75-25-2	Bromoform	500.	UD	5.	U	5.	U	5.	U	500.	UD
74-83-9	Bromomethane	500.	UD	5.	U	5.	U	5.	U	500.	UD
75-15-0	Carbon disulfide	5000.	UD	50.	U	50.	U	50.	U	5000.	UD
56-23-5	Carbon tetrachloride	500.	UD	5.	U	5.	U	5.	U	500.	UD
108-90-7	Chlorobenzene	500.	UD	5.	U	5.	U	5.	U	500.	UD
124-48-1	Dibromochloromethane	500.	UD	5.	U	5.	U	5.	U	500.	UD
75-00-3	Chloroethane	500.	UD	5.	U	5.	U	5.	U	500.	UD
110-75-8	2-Chloroethylvinylether	5000.	UD	50.	U	50.	U	50.	U	5000.	UD
67-66-3	Chloroform	500.	UD	5.	U	5.	U	5.	U	500.	UD
74-87-3	Chloromethane	1000.	UD	10.	U	10.	U	10.	U	1000.	UD
74-95-3	Dibromomethane	500.	UD	5.	U	5.	U	5.	U	500.	UD
764-41-0	1,4-Dichloro-2-butene	1000.	UD	10.	U	10.	U	10.	U	1000.	UD
75-71-8	Dichlorodifluoromethane	500.	UD	5.	U	5.	U	5.	U	500.	UD
95-50-1	1,2-Dichlorobenzene	500.	UD	5.	U	5.	U	5.	U	500.	UD
541-73-1	1,3-Dichlorobenzene	500.	UD	5.	U	5.	U	5.	U	500.	UD
106-46-7	1,4-Dichlorobenzene	500.	UD	5.	U	5.	U	5.	U	500.	UD
75-34-3	1,1-Dichloroethane	500.	UD	5.	U	5.	U	5.	U	500.	UD
107-06-2	1,2-Dichloroethane	500.	UD	5.	U	5.	U	5.	U	500.	UD
75-35-4	1,1-Dichloroethene	500.	UD	5.	U	5.	U	5.	U	500.	UD
156-60-5	trans-1,2-Dichloroethene	500.	UD	5.	U	5.	U	5.	U	500.	UD
78-87-5	1,2-Dichloropropane	500.	UD	5.	U	5.	U	5.	U	500.	UD
10061-01-5	cis-1,3-Dichloropropene	500.	UD	5.	U	5.	U	5.	U	500.	UD
10061-02-6	trans-1,3-Dichloropropene	500.	UD	5.	U	5.	U	5.	U	500.	UD
100-41-4	Ethylbenzene	500.	UD	5.	U	5.	U	5.	U	500.	UD
97-63-2	Ethyl methacrylate	5000.	UD	50.	U	50.	U	50.	U	5000.	UD
591-78-6	2-Hexanone	5000.	UD	50.	U	50.	U	50.	U	5000.	UD
74-88-4	Methyl iodide	500.	UD	5.	U	5.	U	5.	U	500.	UD
108-10-1	4-Methyl-2-Pentanone (MIBK)	5000.	UD	50.	U	50.	U	50.	U	5000.	UD
78-93-3	2-Butanone (MEK)	5000.	UD	50.	U	50.	U	50.	U	5000.	UD
75-09-2	Methylene chloride	5000.	UD	50.	U	50.	U	50.	U	5000.	UD
1634-04-4	Methyl tert-butyl ether	1000.	UD	10.	U	10.	U	10.	U	1000.	UD
100-42-5	Styrene	500.	UD	5.	U	5.	U	5.	U	500.	UD

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 VOCs in Groundwater

SW846-VOA												
	SAMPLE ID ------->	039-S-GB09-17		039-C-GB10-10		039-S-GB10-10		039-S-GB10-13		039-S-GB10-17		
	ORIGINAL ID ----->	039SGB0917		039CGB1010		039SGB1010		039SGB1013		039SGB1017		
	LAB SAMPLE ID --->	9611855-16		9611855-04		9611855-17		9611855-18		9611855-19		
	ID FROM REPORT -->	039SGB0917		039CGB1010		039SGB1010		039SGB1013		039SGB1017		
	SAMPLE DATE ----->	11/26/96		11/26/96		11/26/96		11/26/96		11/26/96		
	DATE ANALYZED --->	12/10/96		12/06/96		12/10/96		12/10/96		12/10/96		
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		
	UNITS ---------->	ug/KG		ug/KG		ug/KG		ug/KG		ug/KG		
CAS #	Parameter	9611855	VAL	9611855	VAL	9611855	VAL	9611855	VAL	9611855	VAL	
79-34-5	1,1,2,2-Tetrachloroethane	500.	UD	5.	U	5.	U	5.	U	500.	UD	
127-18-4	Tetrachloroethene	500.	UD	5.	U	5.	U	5.	U	500.	UD	
108-88-3	Toluene	500.	UD	5.	U	5.	U	5.	U	500.	UD	
71-55-6	1,1,1-Trichloroethane	500.	UD	5.	U	5.	U	5.	U	500.	UD	
79-00-5	1,1,2-Trichloroethane	500.	UD	5.	U	5.	U	5.	U	500.	UD	
79-01-6	Trichloroethene	500.	UD	5.	U	5.	U	5.	U	500.	UD	
75-69-4	Trichlorofluoromethane	500.	UD	5.	U	5.	U	5.	U	500.	UD	
96-18-4	1,2,3-Trichloropropane	500.	UD	5.	U	5.	U	5.	U	500.	UD	
108-05-4	Vinyl acetate	5000.	UD	50.	U	50.	U	50.	U	5000.	UD	
75-01-4	Vinyl chloride	1000.	UD	10.	U	10.	U	10.	U	1000.	UD	
1330-20-7	Xylene (Total)	500.	UD	5.	U	5.	U	5.	U	500.	UD	
156-59-2	cis-1,2-Dichloroethene	500.	UD	5.	U	5.	U	5.	U	500.	UD	

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 VOCs in Groundwater

SW846-VOA															
	SAMPLE ID ------->	039-G-GB01-47		039-G-GB02-14		039-G-GB02-47		039-G-GB03-14		039-G-GB03-43		039-G-GB04-13	
	ORIGINAL ID ----->	039GGB0147		039GGB0214		039GGB0247		039GGB0314		039GGB0343		039GGB0413	
	LAB SAMPLE ID --->	039G0147		039G0214		039G0247		039G0314		039G0343		039G0413	
	ID FROM REPORT -->	039GGB0147		039GGB0214		039GGB0247		039GGB0314		039GGB0343		039GGB0413	
	SAMPLE DATE ----->	10/15/96		10/15/96		10/15/96		10/15/96		10/10/96		10/16/96	
	DATE ANALYZED --->	10/16/96		10/17/96		10/17/96		10/16/96		10/10/96		10/16/96	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
CAS #	Parameter	1	VAL	1	VAL	1	VAL	1	VAL	1	VAL	1	VAL
74-87-3	Chloromethane	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
74-83-9	Bromomethane	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
75-01-4	Vinyl chloride	10.	UJ	10.	UJ	10.	UJ	10.	U	10.	U	10.	U
75-09-2	Methylene chloride	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
67-64-1	Acetone	100.	UJ	100.	UJ	100.	U	100.	U	100.	UJ	100.	U
75-15-0	Carbon disulfide	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
75-35-4	1,1-Dichloroethene	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
75-34-3	1,1-Dichloroethane	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
540-59-0	1,2-Dichloroethene (total)	10.	UJ	10.	UJ	10.	U	10.	U	20.	U	10.	U
67-66-3	Chloroform	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
107-06-2	1,2-Dichloroethane	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
78-93-3	2-Butanone (MEK)	50.	UJ	50.	UJ	50.	U	50.	U	50.	UJ	50.	U
71-55-6	1,1,1-Trichloroethane	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
56-23-5	Carbon tetrachloride	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
75-27-4	Bromodichloromethane	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
78-87-5	1,2-Dichloropropane	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
10061-01-5	cis-1,3-Dichloropropene	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
79-01-6	Trichloroethene	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
124-48-1	Dibromochloromethane	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
79-00-5	1,1,2-Trichloroethane	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
71-43-2	Benzene	10.	UJ	10.	UJ	10.	UJ	10.	U	10.	U	10.	U
10061-02-6	trans-1,3-Dichloropropene	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
75-25-2	Bromoform	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ
108-10-1	4-Methyl-2-Pentanone (MIBK)	50.	UJ	50.	UJ	50.	U	50.	U	50.	UJ	50.	U
591-78-6	2-Hexanone	50.	UJ	50.	UJ	50.	U	50.	U	50.	UJ	50.	U
127-18-4	Tetrachloroethene	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
79-34-5	1,1,2,2-Tetrachloroethane	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ
108-88-3	Toluene	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
108-90-7	Chlorobenzene	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
100-41-4	Ethylbenzene	10.	UJ	260.	J	33.	J	10.	U	10.	U	10.	U
100-42-5	Styrene	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
75-71-8	Dichlorodifluoromethane	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
75-69-4	Trichlorofluoromethane	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
142-28-9	1,3-Dichloropropane	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
108-38-3	m-Xylene	20.	UJ	1050.	J	130.	J	20.	U	20.	U	36.	J
95-47-6	o-Xylene	10.	UJ	10.	UJ	64.	J	10.	U	10.	U	30.	J

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 VOCs in Groundwater

SW846-VOA								
	SAMPLE ID ------->	039-G-GB04-43		039-G-GB05-43				
	ORIGINAL ID ----->	039GGB0443		039GGB0543				
	LAB SAMPLE ID --->	039G0443		039G0543				
	ID FROM REPORT -->	039GGB0443		039GGB0543				
	SAMPLE DATE ----->	10/14/96		10/16/96				
	DATE ANALYZED --->	10/16/96		10/16/96				
	MATRIX ---------->	Water		Water				
	UNITS ---------->	ug/l		ug/L				
CAS #	Parameter	1	VAL	1	VAL			
74-87-3	Chloromethane	10.	U	10.	U			
74-83-9	Bromomethane	10.	U	10.	U			
75-01-4	Vinyl chloride	10.	U	10.	U			
75-09-2	Methylene chloride	10.	U	11.				
67-64-1	Acetone	100.	U	100.	U			
75-15-0	Carbon disulfide	10.	U	10.	U			
75-35-4	1,1-Dichloroethene	10.	U	10.	U			
75-34-3	1,1-Dichloroethane	10.	U	10.	U			
540-59-0	1,2-Dichloroethene (total)	10.	U	10.	U			
67-66-3	Chloroform	10.	U	10.	U			
107-06-2	1,2-Dichloroethane	10.	U	10.	U			
78-93-3	2-Butanone (MEK)	50.	U	50.	U			
71-55-6	1,1,1-Trichloroethane	10.	U	10.	U			
56-23-5	Carbon tetrachloride	10.	U	10.	U			
75-27-4	Bromodichloromethane	10.	U	10.	U			
78-87-5	1,2-Dichloropropane	10.	U	10.	U			
10061-01-5	cis-1,3-Dichloropropene	10.	U	10.	U			
79-01-6	Trichloroethene	10.	U	10.	U			
124-48-1	Dibromochloromethane	10.	U	10.	U			
79-00-5	1,1,2-Trichloroethane	10.	U	10.	U			
71-43-2	Benzene	10.	U	10.	U			
10061-02-6	trans-1,3-Dichloropropene	10.	U	10.	U			
75-25-2	Bromoform	10.	UJ	10.	UJ			
108-10-1	4-Methyl-2-Pentanone (MIBK)	50.	U	50.	U			
591-78-6	2-Hexanone	50.	U	50.	U			
127-18-4	Tetrachloroethene	10.	U	10.	U			
79-34-5	1,1,2,2-Tetrachloroethane	10.	UJ	10.	UJ			
108-88-3	Toluene	10.	U	10.	U			
108-90-7	Chlorobenzene	10.	U	10.	U			
100-41-4	Ethylbenzene	10.	U	10.	U			
100-42-5	Styrene	10.	U	10.	U			
75-71-8	Dichlorodifluoromethane	10.	U	10.	U			
75-69-4	Trichlorofluoromethane	10.	U	10.	U			
142-28-9	1,3-Dichloropropane	10.	U	10.	U			
108-38-3	m-Xylene	20.	U	20.	U			
95-47-6	o-Xylene	10.	U	10.	U			

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 39 VOCs in Groundwater

SW846-VOA									
	SAMPLE ID ------->	039-G-0100-44		039-G-GB04-43					
	ORIGINAL ID ----->	039H010044		039GGB0443					
	LAB SAMPLE ID --->	139437		155657					
	ID FROM REPORT -->	039H010044		039ggb0443					
	SAMPLE DATE ----->			10/14/96					
	DATE ANALYZED --->	11/30/95		10/22/96					
	MATRIX ---------->	Water		Water					
	UNITS ---------->	UG/L		ug/L					
CAS #	Parameter	1631	VAL	2045	VAL				
74-87-3	Chloromethane	10.	U	10.	U				
74-83-9	Bromomethane	10.	U	10.	U				
75-01-4	Vinyl chloride	10.	U	10.	U				
75-00-3	Chloroethane	10.	U	10.	U				
75-09-2	Methylene chloride	10.	U	10.	U				
67-64-1	Acetone	10.	U	16.	U				
75-15-0	Carbon disulfide	10.	U	10.	U				
75-35-4	1,1-Dichloroethene	10.	U	10.	U				
75-34-3	1,1-Dichloroethane	10.	U	10.	U				
540-59-0	1,2-Dichloroethene (total)	10.	U	10.	U				
67-66-3	Chloroform	10.	U	10.	U				
107-06-2	1,2-Dichloroethane	10.	U	10.	U				
78-93-3	2-Butanone (MEK)	10.	U	10.	U				
71-55-6	1,1,1-Trichloroethane	10.	U	10.	U				
56-23-5	Carbon tetrachloride	10.	U	10.	U				
75-27-4	Bromodichloromethane	10.	U	10.	U				
78-87-5	1,2-Dichloropropane	10.	U	10.	U				
10061-01-5	cis-1,3-Dichloropropene	10.	U	10.	U				
79-01-6	Trichloroethene	10.	U	5.	J				
124-48-1	Dibromochloromethane	10.	U	10.	U				
79-00-5	1,1,2-Trichloroethane	10.	U	10.	U				
71-43-2	Benzene	10.	U	10.	U				
10061-02-6	trans-1,3-Dichloropropene	10.	U	10.	U				
75-25-2	Bromoform	10.	U	10.	U				
108-10-1	4-Methyl-2-Pentanone (MIBK)	10.	U	10.	U				
591-78-6	2-Hexanone	10.	U	10.	U				
127-18-4	Tetrachloroethene	10.	U	10.	U				
79-34-5	1,1,2,2-Tetrachloroethane	10.	U	10.	U				
108-88-3	Toluene	10.	U	10.	U				
108-90-7	Chlorobenzene	10.	U	10.	U				
100-41-4	Ethylbenzene	10.	U	10.	U				
100-42-5	Styrene	10.	U	10.	U				
1330-20-7	Xylene (Total)	21.		10.	U				

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, ASSEMBLY F, RFI
VOCs in Loess Groundwater (DPT Phase)

SW846-VOA															
	SAMPLE ID ------->	039-G-0013-14		039-G-0014-14		039-G-0015-14		039-G-0016-12		039-G-0017-12		039-G-0018-12	
	ORIGINAL ID ----->	039G001314		039G001414		039G001514		039G001612		039G001712		039G001812	
	LAB SAMPLE ID --->	S883014*1		S883014*2		S883014*3		S883014*4		S883014*5		S883014*6	
	ID FROM REPORT -->	039G001314		039G001414		039G001514		039G001612		039G001712		039G001812	
	SAMPLE DATE ----->	05/22/98		05/22/98		05/22/98		05/22/98		05/22/98		05/22/98	
	DATE ANALYZED --->	05/29/98		05/29/98		05/29/98		06/02/98		06/02/98		06/02/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	MEM51	VAL	MEM51	VAL	MEM51	VAL	MEM51	VAL	MEM51	VAL	MEM51	VAL
74-87-3	Chloromethane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
74-83-9	Bromomethane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-01-4	Vinyl chloride	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-00-3	Chloroethane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-35-4	1,1-Dichloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-09-2	Methylene chloride	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-34-3	1,1-Dichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
67-66-3	Chloroform	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
71-55-6	1,1,1-Trichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
56-23-5	Carbon tetrachloride	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
71-43-2	Benzene	5.	U	2.	J	5.	U	5.	U	5.	U	5.	U
107-06-2	1,2-Dichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
79-01-6	Trichloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
78-87-5	1,2-Dichloropropane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-27-4	Bromodichloromethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-88-3	Toluene	5.	U	11.		5.	U	5.	U	5.	U	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
124-48-1	Dibromochloromethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-90-7	Chlorobenzene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
100-41-4	Ethylbenzene	5.	U	120.		5.	U	5.	U	5.	U	5.	U
100-42-5	Styrene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-25-2	Bromoform	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
67-64-1	Acetone	50.	U	50.	U	50.	U	50.	U	50.	U	50.	U
75-15-0	Carbon disulfide	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
78-93-3	2-Butanone (MEK)	25.	U	25.	U	25.	U	25.	U	25.	U	25.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	25.	U	4.3	J	25.	U	25.	U	25.	U	25.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
591-78-6	2-Hexanone	25.	U	25.	U	25.	UJ	25.	U	25.	U	25.	U
1330-20-7	Xylene (Total)	5.	U	830.	D	5.	U	5.	U	5.	U	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U	26.		5.	U	5.	U	5.	U	5.	U
9999000-44-2	XYLENES	NR		NR		NR		NR		NR		NR	
156-60-5	trans-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	
156-59-2	cis-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, ASSEMBLY F, RFI
VOCs in Loess Groundwater (DPT Phase)

SW846-VOA									
	SAMPLE ID ------->	039-G-0019-12		039-G-0020-14		039-G-0021-12		039-G-0022-14	
	ORIGINAL ID ----->	039G001912		039G002014		039G002112		039G002214	
	LAB SAMPLE ID --->	S882988*1		S883014*7		S882988*6		S883051*3	
	ID FROM REPORT -->	039G001912		039G002014		039G002112		039G002214	
	SAMPLE DATE ----->	05/21/98		05/22/98		05/21/98		05/26/98	
	DATE ANALYZED --->	05/27/98		05/29/98		05/27/98		05/29/98	
	MATRIX ---------->	Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	MEM50	VAL	MEM51	VAL	MEM50	VAL	MEM51	VAL
74-87-3	Chloromethane	10.	U	10.	U	10.	U	10.	U
74-83-9	Bromomethane	10.	U	10.	U	10.	U	10.	U
75-01-4	Vinyl chloride	10.	U	10.	U	10.	U	10.	U
75-00-3	Chloroethane	10.	U	10.	U	10.	U	10.	U
75-35-4	1,1-Dichloroethene	5.	U	5.	U	5.	U	5.	U
75-09-2	Methylene chloride	5.	U	5.	U	5.	U	5.	U
75-34-3	1,1-Dichloroethane	5.	U	5.	U	5.	U	5.	U
67-66-3	Chloroform	5.	U	5.	U	5.	U	5.	U
71-55-6	1,1,1-Trichloroethane	5.	U	5.	U	5.	U	5.	U
56-23-5	Carbon tetrachloride	5.	U	5.	U	5.	U	5.	U
71-43-2	Benzene	5.	U	5.	U	5.	U	5.	U
107-06-2	1,2-Dichloroethane	5.	U	5.	U	5.	U	5.	U
79-01-6	Trichloroethene	5.	U	5.	U	5.	U	5.	U
78-87-5	1,2-Dichloropropane	5.	U	5.	U	5.	U	5.	U
75-27-4	Bromodichloromethane	5.	U	5.	U	5.	U	5.	U
108-88-3	Toluene	5.	U	5.	U	5.	U	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U	5.	U	5.	U	5.	U
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U	5.	U
124-48-1	Dibromochloromethane	5.	U	5.	U	5.	U	5.	U
108-90-7	Chlorobenzene	5.	U	5.	U	5.	U	5.	U
100-41-4	Ethylbenzene	5.	U	5.	U	5.	U	5.	U
100-42-5	Styrene	5.	U	5.	U	5.	U	5.	U
75-25-2	Bromoform	5.	U	5.	U	5.	U	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U	5.	U	5.	U	5.	U
67-64-1	Acetone	50.	U	50.	U	50.	U	50.	U
75-15-0	Carbon disulfide	5.	U	5.	U	5.	U	5.	U
78-93-3	2-Butanone (MEK)	25.	U	25.	U	25.	U	25.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	25.	U	25.	U	25.	U	25.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U	5.	U	5.	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U	5.	U	5.	U	5.	U
591-78-6	2-Hexanone	25.	U	25.	U	25.	U	25.	U
1330-20-7	Xylene (Total)	5.	U	5.	U	5.	U	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U	5.	U	5.	U	5.	U
9999000-44-2	XYLENES	NR		NR		NR		NR	
156-60-5	trans-1,2-Dichloroethene	NR		NR		NR		NR	
156-59-2	cis-1,2-Dichloroethene	NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Loess Groundwater

8260-VOA

SAMPLE ID -------->	039-G-0045-12
ORIGINAL ID ----->	039G004512
LAB SAMPLE ID --->	9901792-02
ID FROM REPORT -->	039G004512
SAMPLE DATE ----->	01/28/99
DATE ANALYZED --->	02/01/99
MATRIX ---------->	Water
UNITS ---------->	UG/L

CAS #	Parameter	9901792	VAL
75-00-3	Chloroethane	1.	U
75-69-4	Trichlorofluoromethane	1.	U
75-35-4	1,1-Dichloroethene	1.	U
75-09-2	Methylene chloride	10.	U
156-60-5	trans-1,2-Dichloroethene	1.	U
75-34-3	1,1-Dichloroethane	1.	U
594-20-7	2,2-Dichloropropane	1.	U
156-59-2	cis-1,2-Dichloroethene	1.	U
67-66-3	Chloroform	1.	U
74-97-5	Chlorobromomethane	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U
563-58-6	1,1-Dichloropropene	1.	U
56-23-5	Carbon tetrachloride	1.	U
107-06-2	1,2-Dichloroethane	1.	U
71-43-2	Benzene	1.	U
79-01-6	Trichloroethene	1.	U
78-87-5	1,2-Dichloropropane	1.	U
75-27-4	Bromodichloromethane	1.	U
74-95-3	Dibromomethane	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U
108-88-3	Toluene	5.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U
142-28-9	1,3-Dichloropropane	1.	U
127-18-4	Tetrachloroethene	5.	U
124-48-1	Dibromochloromethane	1.	U
106-93-4	1,2-Dibromoethane	1.	U
108-90-7	Chlorobenzene	1.	U
100-41-4	Ethylbenzene	1.	U
630-20-6	1,1,1,2-Tetrachloroethane	1.	U
9999900-05-0	m+p Xylene	1.	U
95-47-6	o-Xylene	1.	U
100-42-5	Styrene	1.	U
98-82-8	Benzene, 1-methylethyl-	1.	U
75-25-2	Bromoform	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Loess Groundwater

8260-VOA

SAMPLE ID -------->	039-G-0045-12
ORIGINAL ID ----->	039G004512
LAB SAMPLE ID --->	9901792-02
ID FROM REPORT -->	039G004512
SAMPLE DATE ----->	01/28/99
DATE ANALYZED --->	02/01/99
MATRIX ---------->	Water
UNITS ---------->	UG/L

CAS #	Parameter	9901792	VAL
103-65-1	n-Propylbenzene	1.	U
108-86-1	Bromobenzene	1.	U
108-67-8	Benzene, 1,3,5-trimethyl-	1.	U
95-49-8	2-Chlorotoluene	1.	U
106-43-4	4-Chlorotoluene	1.	U
98-06-6	tert-Butylbenzene	1.	U
95-63-6	Benzene, 1,2,4-trimethyl	1.	U
135-98-8	sec-Butylbenzene	1.	U
99-87-6	p-Isopropyltoluene	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U
104-51-8	n-Butylbenzene	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U
96-12-8	1,2-Dibromo-3-Chloropropane	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U
87-68-3	Hexachlorobutadiene	1.	U
91-20-3	Naphthalene	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U
75-71-8	Dichlorodifluoromethane	1.	U
74-87-3	Chloromethane	1.	U
75-01-4	Vinyl chloride	1.	U
74-83-9	Bromomethane	1.	U
67-64-1	Acetone	20.	U
107-02-8	Acrolein	20.	U
107-13-1	Acrylonitrile	20.	U
78-93-3	2-Butanone (MEK)	20.	U
75-15-0	Carbon disulfide	1.	U
110-75-8	2-Chloroethylvinylether	5.	U
591-78-6	2-Hexanone	5.	U
74-88-4	Methyl iodide	1.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U
108-05-4	Vinyl acetate	10.	U
9999900-00-8	1,3,5-Trimethylbenzene	NR	
9999900-00-3	Isopropylbenzene	NR	
75-05-8	Acetonitrile	50.	U
141-78-6	Ethyl acetate	5.	U
1634-04-4	Methyl tert-butyl ether	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Loess Groundwater

8260-VOA

SAMPLE ID -------->	039-G-0045-12
ORIGINAL ID ----->	039G004512
LAB SAMPLE ID --->	9901792-02
ID FROM REPORT -->	039G004512
SAMPLE DATE ----->	01/28/99
DATE ANALYZED --->	02/01/99
MATRIX ---------->	Water
UNITS ---------->	UG/L

CAS #	Parameter	9901792	VAL
1330-20-7	Xylene (Total)	NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0040-60		039-G-0053-40		039-G-0053-50		039-G-0053-60		039-G-0054-40		039-G-0054-50	
	ORIGINAL ID ----->	039G004060		039G005340		039G005350		039G005360		039G005440		039G005450	
	LAB SAMPLE ID --->	9812355-01		9901406-02		9901406-01		9901406-03		9901406-05		9901406-07	
	ID FROM REPORT -->	039G004060		039G005340		039G005350		039G005360		039G005440		039G005450	
	SAMPLE DATE ----->	12/08/98		01/15/99		01/15/99		01/15/99		01/16/99		01/16/99	
	DATE EXTRACTED -->	12/10/98		01/18/99		01/18/99		01/18/99		01/18/99		01/18/99	
	DATE ANALYZED --->	12/10/98		01/18/99		01/18/99		01/18/99		01/18/99		01/18/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9812355	VAL	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL
67-64-1	Acetone	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
75-05-8	Acetonitrile	NR		50.	U	50.	U	50.	U	50.	U	50.	U
107-02-8	Acrolein	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-13-1	Acrylonitrile	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
71-43-2	Benzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-86-1	Bromobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-97-5	Chlorobromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-25-2	Bromoform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
104-51-8	n-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
135-98-8	sec-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-06-6	tert-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
78-93-3	2-Butanone (MEK)	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
75-15-0	Carbon disulfide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-00-3	Chloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
110-75-8	2-Chloroethylvinylether	20.	U	5.	U	5.	U	5.	U	5.	U	5.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-49-8	2-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-43-4	4-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-12-8	1,2-Dibromo-3-Chloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-93-4	1,2-Dibromoethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-95-3	Dibromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	1.	U	1.	UJ	1.	U	1.	U	1.	U	1.	U
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	4.26	
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-59-2	cis-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
142-28-9	1,3-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0040-60		039-G-0053-40		039-G-0053-50		039-G-0053-60		039-G-0054-40		039-G-0054-50	
	ORIGINAL ID ----->	039G004060		039G005340		039G005350		039G005360		039G005440		039G005450	
	LAB SAMPLE ID --->	9812355-01		9901406-02		9901406-01		9901406-03		9901406-05		9901406-07	
	ID FROM REPORT -->	039G004060		039G005340		039G005350		039G005360		039G005440		039G005450	
	SAMPLE DATE ----->	12/08/98		01/15/99		01/15/99		01/15/99		01/16/99		01/16/99	
	DATE EXTRACTED -->	12/10/98		01/18/99		01/18/99		01/18/99		01/18/99		01/18/99	
	DATE ANALYZED --->	12/10/98		01/18/99		01/18/99		01/18/99		01/18/99		01/18/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9812355	VAL	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL
594-20-7	2,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
563-58-6	1,1-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
141-78-6	Ethyl acetate	NR		5.	U	5.	U	5.	U	5.	U	5.	U
100-41-4	Ethylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-68-3	Hexachlorobutadiene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
74-88-4	Methyl iodide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-82-8	Benzene, 1-methylethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
99-87-6	p-Isopropyltoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-09-2	Methylene chloride	20.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
1634-04-4	Methyl tert-butyl ether	NR		1.	U	1.	U	1.	U	1.	U	1.	U
91-20-3	Naphthalene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
103-65-1	n-Propylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-42-5	Styrene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
630-20-6	1,1,1,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
127-18-4	Tetrachloroethene	1.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-88-3	Toluene	1.	U	5.	U	5.	U	5.	U	5.	U	5.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-01-6	Trichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-63-6	Benzene, 1,2,4-trimethyl	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-67-8	Benzene, 1,3,5-trimethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-05-4	Vinyl acetate	20.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-47-6	o-Xylene	NR		1.	U	1.	U	1.	U	1.	U	1.	U
56-23-5	Carbon tetrachloride	1.	U	NR		NR		NR		NR		NR	
108-90-7	Chlorobenzene	1.	U	NR		NR		NR		NR		NR	
108-38-3	m-Xylene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0040-60		039-G-0053-40		039-G-0053-50		039-G-0053-60		039-G-0054-40		039-G-0054-50	
	ORIGINAL ID ----->	039G004060		039G005340		039G005350		039G005360		039G005440		039G005450	
	LAB SAMPLE ID --->	9812355-01		9901406-02		9901406-01		9901406-03		9901406-05		9901406-07	
	ID FROM REPORT -->	039G004060		039G005340		039G005350		039G005360		039G005440		039G005450	
	SAMPLE DATE ----->	12/08/98		01/15/99		01/15/99		01/15/99		01/16/99		01/16/99	
	DATE EXTRACTED -->	12/10/98		01/18/99		01/18/99		01/18/99		01/18/99		01/18/99	
	DATE ANALYZED --->	12/10/98		01/18/99		01/18/99		01/18/99		01/18/99		01/18/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9812355	VAL	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL
1330-20-7	Xylene (Total)	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
110-57-6	trans-1,4-Dichloro-2-butene	1.	U	NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0054-60		039-G-0055-40		039-G-0055-50		039-G-0055-60		039-G-0056-40		039-G-0056-50	
	ORIGINAL ID ----->	039G005460		039G005540		039G005550		039G005560		039G005640		039G005650	
	LAB SAMPLE ID --->	9901406-06		9901406-04		9901406-08		9901406-09		9901406-10		9901406-11	
	ID FROM REPORT -->	039G005460		039G005540		039G005550		039G005560		039G005640		039G005650	
	SAMPLE DATE ----->	01/16/99		01/16/99		01/16/99		01/16/99		01/17/99		01/17/99	
	DATE EXTRACTED -->	01/18/99		01/18/99		01/18/99		01/18/99		01/19/99		01/19/99	
	DATE ANALYZED --->	01/18/99		01/18/99		01/18/99		01/18/99		01/19/99		01/19/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL
67-64-1	Acetone	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
75-05-8	Acetonitrile	50.	U	50.	U	50.	U	50.	U	50.	U	50.	U
107-02-8	Acrolein	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-13-1	Acrylonitrile	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
71-43-2	Benzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-86-1	Bromobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-97-5	Chlorobromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-25-2	Bromoform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
104-51-8	n-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
135-98-8	sec-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-06-6	tert-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
78-93-3	2-Butanone (MEK)	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
75-15-0	Carbon disulfide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-00-3	Chloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
110-75-8	2-Chloroethylvinylether	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-49-8	2-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-43-4	4-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-12-8	1,2-Dibromo-3-Chloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-93-4	1,2-Dibromoethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-95-3	Dibromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-59-2	cis-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
142-28-9	1,3-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0054-60		039-G-0055-40		039-G-0055-50		039-G-0055-60		039-G-0056-40		039-G-0056-50	
	ORIGINAL ID ----->	039G005460		039G005540		039G005550		039G005560		039G005640		039G005650	
	LAB SAMPLE ID --->	9901406-06		9901406-04		9901406-08		9901406-09		9901406-10		9901406-11	
	ID FROM REPORT -->	039G005460		039G005540		039G005550		039G005560		039G005640		039G005650	
	SAMPLE DATE ----->	01/16/99		01/16/99		01/16/99		01/16/99		01/17/99		01/17/99	
	DATE EXTRACTED -->	01/18/99		01/18/99		01/18/99		01/18/99		01/19/99		01/19/99	
	DATE ANALYZED --->	01/18/99		01/18/99		01/18/99		01/18/99		01/19/99		01/19/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL
594-20-7	2,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
563-58-6	1,1-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
141-78-6	Ethyl acetate	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
100-41-4	Ethylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-68-3	Hexachlorobutadiene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
74-88-4	Methyl iodide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-82-8	Benzene, 1-methylethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
99-87-6	p-Isopropyltoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-09-2	Methylene chloride	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
1634-04-4	Methyl tert-butyl ether	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
91-20-3	Naphthalene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
103-65-1	n-Propylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-42-5	Styrene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
630-20-6	1,1,1,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-88-3	Toluene	5.	U	5.44	U	5.	U	5.	U	5.	U	5.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-01-6	Trichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-63-6	Benzene, 1,2,4-trimethyl	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-67-8	Benzene, 1,3,5-trimethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-05-4	Vinyl acetate	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-47-6	o-Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
56-23-5	Carbon tetrachloride	NR		NR		NR		NR		NR		NR	
108-90-7	Chlorobenzene	NR		NR		NR		NR		NR		NR	
108-38-3	m-Xylene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0054-60		039-G-0055-40		039-G-0055-50		039-G-0055-60		039-G-0056-40		039-G-0056-50	
	ORIGINAL ID ----->	039G005460		039G005540		039G005550		039G005560		039G005640		039G005650	
	LAB SAMPLE ID --->	9901406-06		9901406-04		9901406-08		9901406-09		9901406-10		9901406-11	
	ID FROM REPORT -->	039G005460		039G005540		039G005550		039G005560		039G005640		039G005650	
	SAMPLE DATE ----->	01/16/99		01/16/99		01/16/99		01/16/99		01/17/99		01/17/99	
	DATE EXTRACTED -->	01/18/99		01/18/99		01/18/99		01/18/99		01/19/99		01/19/99	
	DATE ANALYZED --->	01/18/99		01/18/99		01/18/99		01/18/99		01/19/99		01/19/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL
1330-20-7	Xylene (Total)	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA											
	SAMPLE ID ------->	039-H-0056-50		039-G-0056-60		039-G-0057-40		039-G-0057-50		039-G-0057-60	
	ORIGINAL ID ----->	039H005650		039H005660		039G005740		039G005750		039G005760	
	LAB SAMPLE ID --->	9901406-12		9901406-13		9901406-14		9901406-15		9901406-16	
	ID FROM REPORT -->	039H005650		039H005660		039G005740		039G005750		039G005760	
	SAMPLE DATE ----->	01/17/99		01/17/99		01/17/99		01/17/99		01/17/99	
	DATE EXTRACTED -->	01/18/99		01/18/99		01/18/99		01/18/99		01/18/99	
	DATE ANALYZED --->	01/18/99		01/18/99		01/18/99		01/18/99		01/18/99	
	MATRIX ---------->	Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL
67-64-1	Acetone	20.	U	20.	U	20.	U	20.	U	20.	U
75-05-8	Acetonitrile	50.	U	50.	U	50.	U	50.	U	50.	U
107-02-8	Acrolein	20.	U	20.	U	20.	U	20.	U	20.	U
107-13-1	Acrylonitrile	20.	U	20.	U	20.	U	20.	U	20.	U
71-43-2	Benzene	1.	U	1.	U	1.	U	1.	U	1.	U
108-86-1	Bromobenzene	1.	U	1.	U	1.	U	1.	U	1.	U
74-97-5	Chlorobromomethane	1.	U	1.	U	1.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	1.	U	1.	U
75-25-2	Bromoform	1.	U	1.	U	1.	U	1.	U	1.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	1.	U	1.	U
104-51-8	n-Butylbenzene	1.	U	1.	U	2.05		12.1		1.	U
135-98-8	sec-Butylbenzene	1.	U	1.	U	1.	U	7.19	J	1.94	J
98-06-6	tert-Butylbenzene	1.	U	1.	U	1.	U	3.11		1.56	
78-93-3	2-Butanone (MEK)	20.	U	20.	U	20.	U	20.	U	20.	U
75-15-0	Carbon disulfide	1.	U	1.	U	1.	U	1.	U	1.	U
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	1.	U	1.	U
75-00-3	Chloroethane	1.	U	1.	U	1.	U	1.	U	1.	U
110-75-8	2-Chloroethylvinylether	5.	U	5.	U	5.	U	5.	U	5.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	1.	U	1.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	1.	U	1.	U
95-49-8	2-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U
106-43-4	4-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U
96-12-8	1,2-Dibromo-3-Chloropropane	1.	U	1.	U	1.	U	1.	U	1.	U
106-93-4	1,2-Dibromoethane	1.	U	1.	U	1.	U	1.	U	1.	U
74-95-3	Dibromomethane	1.	U	1.	U	1.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	1.	UJ	1.	UJ	1.	UJ	1.	UJ	1.	UJ
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U
156-59-2	cis-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U
142-28-9	1,3-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA											
	SAMPLE ID ------->	039-H-0056-50		039-G-0056-60		039-G-0057-40		039-G-0057-50		039-G-0057-60	
	ORIGINAL ID ----->	039H005650		039H005660		039G005740		039G005750		039G005760	
	LAB SAMPLE ID --->	9901406-12		9901406-13		9901406-14		9901406-15		9901406-16	
	ID FROM REPORT -->	039H005650		039H005660		039G005740		039G005750		039G005760	
	SAMPLE DATE ----->	01/17/99		01/17/99		01/17/99		01/17/99		01/17/99	
	DATE EXTRACTED -->	01/18/99		01/18/99		01/18/99		01/18/99		01/18/99	
	DATE ANALYZED --->	01/18/99		01/18/99		01/18/99		01/18/99		01/18/99	
	MATRIX ---------->	Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL
594-20-7	2,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U
563-58-6	1,1-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U
141-78-6	Ethyl acetate	5.	U	5.	U	5.	U	5.	U	5.	U
100-41-4	Ethylbenzene	1.	U	1.	U	1.	U	7.2	J	2.51	J
87-68-3	Hexachlorobutadiene	1.	U	1.	U	1.	U	1.	U	1.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U
74-88-4	Methyl iodide	1.	U	1.	U	1.	U	1.	U	1.	U
98-82-8	Benzene, 1-methylethyl-	1.	U	1.	U	1.	U	9.67		2.75	
99-87-6	p-Isopropyltoluene	1.	U	1.	U	1.61		9.28		4.96	
75-09-2	Methylene chloride	10.	U	10.	U	10.	U	10.	U	10.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U
1634-04-4	Methyl tert-butyl ether	1.	U	1.	U	1.	U	1.	U	1.	U
91-20-3	Naphthalene	1.	U	1.	U	1.73	U	4.39	U	2.59	U
103-65-1	n-Propylbenzene	1.	U	1.	U	2.48	J	24.8	J	11.6	J
100-42-5	Styrene	1.	U	1.	U	1.	U	1.	U	1.	U
630-20-6	1,1,1,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U	5.	U	5.	U
108-88-3	Toluene	5.	U	5.	U	5.	U	5.	U	5.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U
79-01-6	Trichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U
95-63-6	Benzene, 1,2,4-trimethyl	1.	U	1.	U	31.2		150.		78.	
108-67-8	Benzene, 1,3,5-trimethyl-	1.	U	1.	U	15.9		75.3		40.5	
108-05-4	Vinyl acetate	10.	U	10.	U	10.	U	10.	U	10.	U
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	1.	U	1.	U
95-47-6	o-Xylene	1.	U	1.	U	6.23		18.4		11.8	
56-23-5	Carbon tetrachloride	NR		NR		NR		NR		NR	
108-90-7	Chlorobenzene	NR		NR		NR		NR		NR	
108-38-3	m-Xylene	NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA											
	SAMPLE ID ------->	039-H-0056-50		039-G-0056-60		039-G-0057-40		039-G-0057-50		039-G-0057-60	
	ORIGINAL ID ----->	039H005650		039H005660		039G005740		039G005750		039G005760	
	LAB SAMPLE ID --->	9901406-12		9901406-13		9901406-14		9901406-15		9901406-16	
	ID FROM REPORT -->	039H005650		039H005660		039G005740		039G005750		039G005760	
	SAMPLE DATE ----->	01/17/99		01/17/99		01/17/99		01/17/99		01/17/99	
	DATE EXTRACTED -->	01/18/99		01/18/99		01/18/99		01/18/99		01/18/99	
	DATE ANALYZED --->	01/18/99		01/18/99		01/18/99		01/18/99		01/18/99	
	MATRIX ---------->	Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL	9901406	VAL
1330-20-7	Xylene (Total)	1.	U	1.	U	7.32		38.1		13.4	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SEMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

SW846-VOA													
	SAMPLE ID ------->	039-G-0013-40		039-G-0013-50		039-G-0014-40		039-G-0014-50		039-G-0014-55		039-G-0015-40	
	ORIGINAL ID ----->	039G001340		039G001350		039G001440		039G001450		039G001455		039G001540	
	LAB SAMPLE ID --->	S882801*2		S882801*3		S882847*3		S882847*4		S882847*5		S882847*6	
	ID FROM REPORT -->	039G001340		039G001350		039G001440		039G001450		039G001455		039G001540	
	SAMPLE DATE ----->	05/14/98		05/14/98		05/15/98		05/15/98		05/15/98		05/15/98	
	DATE ANALYZED --->	05/27/98		05/27/98		05/21/98		05/21/98		05/22/98		05/22/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	MEM48	VAL	MEM48	VAL	MEM48	VAL	MEM48	VAL	MEM48	VAL	MEM48	VAL
74-87-3	Chloromethane	10.	U	10.	U	10.	U	10.	U	10.	UJ	10.	UJ
74-83-9	Bromomethane	10.	U	10.	U	10.	U	10.	U	10.	UJ	10.	UJ
75-01-4	Vinyl chloride	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-00-3	Chloroethane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-35-4	1,1-Dichloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-09-2	Methylene chloride	5.	U	5.	U	5.	U	5.	U	5.	UJ	5.	UJ
75-34-3	1,1-Dichloroethane	5.	U	5.	U	5.	U	5.	U	5.	UJ	5.	UJ
67-66-3	Chloroform	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
71-55-6	1,1,1-Trichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
56-23-5	Carbon tetrachloride	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
71-43-2	Benzene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
107-06-2	1,2-Dichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
79-01-6	Trichloroethene	5.	U	5.	U	5.	U	5.	U	5.	UJ	5.	UJ
78-87-5	1,2-Dichloropropane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-27-4	Bromodichloromethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-88-3	Toluene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U	5.	U	5.	U	5.	U	5.	UJ	5.	UJ
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U	5.	U	5.	UJ	5.	UJ
124-48-1	Dibromochloromethane	5.	U	5.	U	5.	U	5.	U	5.	UJ	5.	UJ
108-90-7	Chlorobenzene	5.	U	5.	U	5.	U	5.	U	5.	UJ	5.	UJ
100-41-4	Ethylbenzene	5.	U	5.	U	3.1	J	3.	J	5.	U	5.	U
100-42-5	Styrene	5.	U	5.	U	5.	U	5.	U	5.	UJ	5.	UJ
75-25-2	Bromoform	5.	U	5.	U	5.	U	5.	U	5.	UJ	5.	UJ
79-34-5	1,1,2,2-Tetrachloroethane	5.	U	5.	U	5.	U	5.	U	5.	UJ	5.	UJ
67-64-1	Acetone	50.	U	260.	J	50.	U	50.	U	50.	U	460.	
75-15-0	Carbon disulfide	5.	U	5.	U	5.	U	5.	U	5.	UJ	5.	UJ
78-93-3	2-Butanone (MEK)	25.	U	25.	U	25.	U	25.	U	25.	U	25.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	25.	U	25.	U	25.	U	25.	U	25.	U	25.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
591-78-6	2-Hexanone	25.	U	25.	U	25.	U	25.	U	25.	U	25.	U
1330-20-7	Xylene (Total)	5.	U	5.	U	32.		24.		11.	J	5.	UJ
540-59-0	1,2-Dichloroethene (total)	5.	U	5.	U	5.	U	5.	U	5.	UJ	5.	UJ
9999000-44-2	XYLENES	NR		NR		NR		NR		NR		NR	
156-60-5	trans-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	
156-59-2	cis-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SEMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

SW846-VOA													
	SAMPLE ID ------->	039-G-0015-50		039-G-0015-57		039-G-0016-40		039-G-0016-50		039-H-0016-50		039-G-0016-60	
	ORIGINAL ID ----->	039G001550		039G001557		039G001640		039G001650		039H001650		039G001660	
	LAB SAMPLE ID --->	S882847*7		S882847*8		S882899*1		S882899*2		S882899*12		S882899*3	
	ID FROM REPORT -->	039G001550		039G001557		039G001640		039G001650		039H001650		039G001660	
	SAMPLE DATE ----->	05/15/98		05/15/98		05/18/98		05/18/98		05/19/98		05/18/98	
	DATE ANALYZED --->	05/22/98		05/22/98		05/28/98		05/28/98		05/29/98		05/28/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	MEM48	VAL	MEM48	VAL	MEM50	VAL	MEM50	VAL	MEM50	VAL	MEM50	VAL
74-87-3	Chloromethane	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
74-83-9	Bromomethane	10.	UJ	10.	UJ	10.	U	10.	U	10.	U	10.	U
75-01-4	Vinyl chloride	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-00-3	Chloroethane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-35-4	1,1-Dichloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-09-2	Methylene chloride	5.	UJ	5.	UJ	5.	U	5.	U	5.	U	5.	U
75-34-3	1,1-Dichloroethane	5.	UJ	5.	UJ	5.	U	5.	U	5.	U	5.	U
67-66-3	Chloroform	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
71-55-6	1,1,1-Trichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
56-23-5	Carbon tetrachloride	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
71-43-2	Benzene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
107-06-2	1,2-Dichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
79-01-6	Trichloroethene	5.	UJ	5.	UJ	5.	U	5.	U	5.	U	5.	U
78-87-5	1,2-Dichloropropane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-27-4	Bromodichloromethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-88-3	Toluene	5.	U	5.	U	2.6	J	5.	U	5.	U	5.	U
79-00-5	1,1,2-Trichloroethane	5.	UJ	5.	UJ	5.	U	5.	U	5.	U	5.	U
127-18-4	Tetrachloroethene	5.	UJ	5.	UJ	5.	U	5.	U	5.	U	5.	U
124-48-1	Dibromochloromethane	5.	UJ	5.	UJ	5.	U	5.	U	5.	U	5.	U
108-90-7	Chlorobenzene	5.	UJ	5.	UJ	5.	U	5.	U	5.	U	5.	U
100-41-4	Ethylbenzene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
100-42-5	Styrene	5.	UJ	5.	UJ	5.	U	5.	U	5.	U	5.	U
75-25-2	Bromoform	5.	UJ	5.	UJ	5.	U	5.	U	5.	U	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	UJ	5.	UJ	5.	U	5.	U	5.	U	5.	U
67-64-1	Acetone	110.		50.	U	50.	U	50.	U	50.	U	50.	U
75-15-0	Carbon disulfide	5.	UJ	5.	UJ	5.	U	5.	U	5.	U	5.	U
78-93-3	2-Butanone (MEK)	25.	U	25.	U	25.	U	25.	U	25.	U	25.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	25.	U	25.	U	25.	U	25.	U	25.	U	25.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
591-78-6	2-Hexanone	25.	U	25.	U	25.	U	25.	U	25.	U	25.	U
1330-20-7	Xylene (Total)	5.	UJ	5.	UJ	2.5	J	5.	U	5.	U	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	UJ	5.	UJ	5.	U	5.	U	5.	U	5.	U
9999000-44-2	XYLENES	NR		NR		NR		NR		NR		NR	
156-60-5	trans-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	
156-59-2	cis-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SEMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

SW846-VOA													
	SAMPLE ID ------->	039-G-0017-40		039-G-0017-50		039-G-0017-60		039-G-0018-40		039-G-0018-50		039-G-0018-60	
	ORIGINAL ID ----->	039G001740		039G001750		039G001760		039G001840		039G001850		039G001860	
	LAB SAMPLE ID --->	S882899*4		S882899*5		S882899*6		S882899*7		S882899*8		S882899*9	
	ID FROM REPORT -->	039G001740		039G001750		039G001760		039G001840		039G001850		039G001860	
	SAMPLE DATE ----->	05/18/98		05/18/98		05/19/98		05/19/98		05/19/98		05/19/98	
	DATE ANALYZED --->	05/28/98		05/28/98		05/28/98		05/28/98		05/28/98		05/28/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	MEM50	VAL	MEM50	VAL	MEM50	VAL	MEM50	VAL	MEM50	VAL	MEM50	VAL
74-87-3	Chloromethane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
74-83-9	Bromomethane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-01-4	Vinyl chloride	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-00-3	Chloroethane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-35-4	1,1-Dichloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-09-2	Methylene chloride	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-34-3	1,1-Dichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
67-66-3	Chloroform	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
71-55-6	1,1,1-Trichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
56-23-5	Carbon tetrachloride	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
71-43-2	Benzene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
107-06-2	1,2-Dichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
79-01-6	Trichloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
78-87-5	1,2-Dichloropropane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-27-4	Bromodichloromethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-88-3	Toluene	5.	U	5.	U	5.	U	3.4	J	5.	U	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
124-48-1	Dibromochloromethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-90-7	Chlorobenzene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
100-41-4	Ethylbenzene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
100-42-5	Styrene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-25-2	Bromoform	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
67-64-1	Acetone	50.	U	50.	U	50.	U	50.	U	50.	U	50.	U
75-15-0	Carbon disulfide	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
78-93-3	2-Butanone (MEK)	25.	U	25.	U	25.	U	25.	U	25.	U	25.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	25.	U	25.	U	25.	U	25.	U	25.	U	25.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
591-78-6	2-Hexanone	25.	U	25.	U	25.	U	25.	U	25.	U	25.	U
1330-20-7	Xylene (Total)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
9999000-44-2	XYLENES	NR		NR		NR		NR		NR		NR	
156-60-5	trans-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	
156-59-2	cis-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SEMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

SW846-VOA													
	SAMPLE ID ------->	039-G-0019-43		039-G-0019-50		039-G-0019-60		039-H-0019-60		039-G-0020-43		039-G-0020-50	
	ORIGINAL ID ----->	039G001943		039G001950		039G001960		039H001960		039G002043		039G002050	
	LAB SAMPLE ID --->	S882899*10		S882899*11		S882988*2		S882988*10		S882988*3		S882988*4	
	ID FROM REPORT -->	039G001943		039G001950		039G001960		039H001960		039G002043		039G002050	
	SAMPLE DATE ----->	05/19/98		05/19/98		05/20/98		05/20/98		05/20/98		05/20/98	
	DATE ANALYZED --->	05/29/98		05/29/98		05/27/98		05/28/98		05/27/98		05/27/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	MEM50	VAL	MEM50	VAL	MEM50	VAL	MEM50	VAL	MEM50	VAL	MEM50	VAL
74-87-3	Chloromethane	10.	U	10.	U	10.	U	10.	U	6.6	J	10.	U
74-83-9	Bromomethane	10.	U	10.	U	10.	U	10.	UJ	10.	U	10.	U
75-01-4	Vinyl chloride	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-00-3	Chloroethane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-35-4	1,1-Dichloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-09-2	Methylene chloride	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-34-3	1,1-Dichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
67-66-3	Chloroform	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
71-55-6	1,1,1-Trichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
56-23-5	Carbon tetrachloride	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
71-43-2	Benzene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
107-06-2	1,2-Dichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
79-01-6	Trichloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
78-87-5	1,2-Dichloropropane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-27-4	Bromodichloromethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-88-3	Toluene	3.2	J	5.	U	5.	U	5.	U	5.	U	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
124-48-1	Dibromochloromethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-90-7	Chlorobenzene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
100-41-4	Ethylbenzene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
100-42-5	Styrene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-25-2	Bromoform	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
67-64-1	Acetone	50.	U	50.	U	50.	U	50.	UJ	50.	U	50.	U
75-15-0	Carbon disulfide	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
78-93-3	2-Butanone (MEK)	25.	U	25.	U	25.	U	25.	UJ	25.	U	25.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	25.	U	25.	U	25.	U	25.	UJ	25.	U	25.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
591-78-6	2-Hexanone	25.	U	25.	U	25.	U	25.	UJ	25.	U	25.	U
1330-20-7	Xylene (Total)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
9999000-44-2	XYLENES	NR		NR		NR		NR		NR		NR	
156-60-5	trans-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	
156-59-2	cis-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SEMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

SW846-VOA													
	SAMPLE ID ------->	039-G-0020-60		039-G-0021-43		039-G-0021-50		039-G-0021-58		039-G-0022-43		039-G-0022-50	
	ORIGINAL ID ----->	039G002060		039G002143		039G002150		039G002158		039G002243		039G002250	
	LAB SAMPLE ID --->	S882988*5		S882988*7		S882988*8		S882988*9		S883051*4		S883051*5	
	ID FROM REPORT -->	039G002060		039G002143		039G002150		039G002158		039G002243		039G002250	
	SAMPLE DATE ----->	05/20/98		05/21/98		05/21/98		05/21/98		05/26/98		05/26/98	
	DATE ANALYZED --->	05/27/98		05/27/98		05/27/98		05/28/98		05/29/98		06/02/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	MEM50	VAL	MEM50	VAL	MEM50	VAL	MEM50	VAL	MEM51	VAL	MEM51	VAL
74-87-3	Chloromethane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
74-83-9	Bromomethane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-01-4	Vinyl chloride	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-00-3	Chloroethane	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
75-35-4	1,1-Dichloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-09-2	Methylene chloride	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-34-3	1,1-Dichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
67-66-3	Chloroform	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
71-55-6	1,1,1-Trichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
56-23-5	Carbon tetrachloride	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
71-43-2	Benzene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
107-06-2	1,2-Dichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
79-01-6	Trichloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	9.6	U
78-87-5	1,2-Dichloropropane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-27-4	Bromodichloromethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-88-3	Toluene	8.1	U	7.1	U	6.9	U	2.4	U	5.	U	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
124-48-1	Dibromochloromethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-90-7	Chlorobenzene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
100-41-4	Ethylbenzene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
100-42-5	Styrene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
75-25-2	Bromoform	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
67-64-1	Acetone	50.	U	10.	J	50.	U	50.	U	50.	U	50.	U
75-15-0	Carbon disulfide	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
78-93-3	2-Butanone (MEK)	25.	U	25.	U	30.		25.	U	26.		25.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	25.	U	25.	U	25.	U	25.	U	25.	U	25.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
591-78-6	2-Hexanone	25.	U	25.	U	25.	U	25.	U	25.	U	25.	U
1330-20-7	Xylene (Total)	5.	U	5.	U	5.9		5.	U	5.	U	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
9999000-44-2	XYLENES	NR		NR		NR		NR		NR		NR	
156-60-5	trans-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	
156-59-2	cis-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SEMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

SW846-VOA								
	SAMPLE ID ------->	039-G-0022-58		039-H-0022-58				
	ORIGINAL ID ----->	039G002258		039H002258				
	LAB SAMPLE ID --->	S883051*6		S883051*7				
	ID FROM REPORT -->	039G002258		039H002258				
	SAMPLE DATE ----->	05/26/98		05/26/98				
	DATE ANALYZED --->	06/02/98		06/02/98				
	MATRIX ---------->	Water		Water				
	UNITS ---------->	UG/L		UG/L				
CAS #	Parameter	MEM51	VAL	MEM51	VAL			
74-87-3	Chloromethane	10.	U	10.	U			
74-83-9	Bromomethane	10.	U	10.	U			
75-01-4	Vinyl chloride	10.	U	10.	U			
75-00-3	Chloroethane	10.	U	10.	U			
75-35-4	1,1-Dichloroethene	5.	U	5.	U			
75-09-2	Methylene chloride	5.	U	5.	U			
75-34-3	1,1-Dichloroethane	5.	U	5.	U			
67-66-3	Chloroform	5.	U	5.	U			
71-55-6	1,1,1-Trichloroethane	5.	U	5.	U			
56-23-5	Carbon tetrachloride	5.	U	5.	U			
71-43-2	Benzene	5.	U	5.	U			
107-06-2	1,2-Dichloroethane	5.	U	5.	U			
79-01-6	Trichloroethene	5.	U	5.	U			
78-87-5	1,2-Dichloropropane	5.	U	5.	U			
75-27-4	Bromodichloromethane	5.	U	5.	U			
108-88-3	Toluene	5.	U	5.	U			
79-00-5	1,1,2-Trichloroethane	5.	U	5.	U			
127-18-4	Tetrachloroethene	5.	U	5.	U			
124-48-1	Dibromochloromethane	5.	U	5.	U			
108-90-7	Chlorobenzene	5.	U	5.	U			
100-41-4	Ethylbenzene	5.	U	5.	U			
100-42-5	Styrene	5.	U	5.	U			
75-25-2	Bromoform	5.	U	5.	U			
79-34-5	1,1,2,2-Tetrachloroethane	5.	U	5.	U			
67-64-1	Acetone	50.	U	50.	U			
75-15-0	Carbon disulfide	5.	U	5.	U			
78-93-3	2-Butanone (MEK)	25.	U	25.	U			
108-10-1	4-Methyl-2-Pentanone (MIBK)	25.	U	25.	U			
10061-01-5	cis-1,3-Dichloropropene	5.	U	5.	U			
10061-02-6	trans-1,3-Dichloropropene	5.	U	5.	U			
591-78-6	2-Hexanone	25.	U	25.	U			
1330-20-7	Xylene (Total)	5.	U	5.	U			
540-59-0	1,2-Dichloroethene (total)	5.	U	5.	U			
9999000-44-2	XYLENES	NR		NR				
156-60-5	trans-1,2-Dichloroethene	NR		NR				
156-59-2	cis-1,2-Dichloroethene	NR		NR				

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA															
	SAMPLE ID ------->	039-G-0023-40		039-G-0023-50		039-G-0023-60		039-G-0024-40		039-G-0024-50		039-G-0024-60	
	ORIGINAL ID ----->	039G002340		039G002350		039G002360		039G002440		039G002450		039G002460	
	LAB SAMPLE ID --->	11189810		11189811		11189812		11189813		11209803		11199803	
	ID FROM REPORT -->	039G002340		039G002350		039G002360		039G002440		039G002450		039G002460	
	SAMPLE DATE ----->	11/17/98		11/17/98		11/17/98		11/17/98		11/17/98		11/18/98	
	DATE ANALYZED --->	11/19/98		11/19/98		11/19/98		11/19/98		11/20/98		11/19/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL
75-00-3	Chloroethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
75-69-4	Trichlorofluoromethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
75-35-4	1,1-Dichloroethene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
75-09-2	Methylene chloride	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
156-60-5	trans-1,2-Dichloroethene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
75-34-3	1,1-Dichloroethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
594-20-7	2,2-Dichloropropane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
156-59-2	cis-1,2-Dichloroethene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
67-66-3	Chloroform	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
74-97-5	Chlorobromomethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
71-55-6	1,1,1-Trichloroethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
563-58-6	1,1-Dichloropropene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
56-23-5	Carbon tetrachloride	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
107-06-2	1,2-Dichloroethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
71-43-2	Benzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
79-01-6	Trichloroethene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
78-87-5	1,2-Dichloropropane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
75-27-4	Bromodichloromethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
74-95-3	Dibromomethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
10061-01-5	cis-1,3-Dichloropropene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
108-88-3	Toluene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
10061-02-6	trans-1,3-Dichloropropene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
79-00-5	1,1,2-Trichloroethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
142-28-9	1,3-Dichloropropane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
127-18-4	Tetrachloroethene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
124-48-1	Dibromochloromethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
106-93-4	1,2-Dibromoethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
108-90-7	Chlorobenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
100-41-4	Ethylbenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
630-20-6	1,1,1,2-Tetrachloroethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
9999900-05-0	m+p Xylene	4.	U	4.	U	4.	U	4.	U	4.	U	4.	UJ
95-47-6	o-Xylene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
100-42-5	Styrene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
98-82-8	Benzene, 1-methylethyl-	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
75-25-2	Bromoform	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
79-34-5	1,1,2,2-Tetrachloroethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
96-18-4	1,2,3-Trichloropropane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0023-40		039-G-0023-50		039-G-0023-60		039-G-0024-40		039-G-0024-50		039-G-0024-60	
	ORIGINAL ID ----->	039G002340		039G002350		039G002360		039G002440		039G002450		039G002460	
	LAB SAMPLE ID --->	11189810		11189811		11189812		11189813		11209803		11199803	
	ID FROM REPORT -->	039G002340		039G002350		039G002360		039G002440		039G002450		039G002460	
	SAMPLE DATE ----->	11/17/98		11/17/98		11/17/98		11/17/98		11/17/98		11/18/98	
	DATE ANALYZED --->	11/19/98		11/19/98		11/19/98		11/19/98		11/20/98		11/19/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL
103-65-1	n-Propylbenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
108-86-1	Bromobenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
108-67-8	Benzene, 1,3,5-trimethyl-	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
95-49-8	2-Chlorotoluene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
106-43-4	4-Chlorotoluene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
98-06-6	tert-Butylbenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
95-63-6	Benzene, 1,2,4-trimethyl	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
135-98-8	sec-Butylbenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
99-87-6	p-Isopropyltoluene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
541-73-1	1,3-Dichlorobenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
106-46-7	1,4-Dichlorobenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
104-51-8	n-Butylbenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
95-50-1	1,2-Dichlorobenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
96-12-8	1,2-Dibromo-3-Chloropropane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
120-82-1	1,2,4-Trichlorobenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
87-68-3	Hexachlorobutadiene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
91-20-3	Naphthalene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
87-61-6	1,2,3-Trichlorobenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
75-71-8	Dichlorodifluoromethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
74-87-3	Chloromethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
75-01-4	Vinyl chloride	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
74-83-9	Bromomethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
67-64-1	Acetone	NR		NR		NR		NR		NR		NR	
107-02-8	Acrolein	NR		NR		NR		NR		NR		NR	
107-13-1	Acrylonitrile	NR		NR		NR		NR		NR		NR	
78-93-3	2-Butanone (MEK)	NR		NR		NR		NR		NR		NR	
75-15-0	Carbon disulfide	NR		NR		NR		NR		NR		NR	
110-75-8	2-Chloroethylvinylether	NR		NR		NR		NR		NR		NR	
591-78-6	2-Hexanone	NR		NR		NR		NR		NR		NR	
74-88-4	Methyl iodide	NR		NR		NR		NR		NR		NR	
108-10-1	4-Methyl-2-Pentanone (MIBK)	NR		NR		NR		NR		NR		NR	
108-05-4	Vinyl acetate	NR		NR		NR		NR		NR		NR	
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		NR		NR	
9999900-00-3	Isopropylbenzene	NR		NR		NR		NR		NR		NR	
75-05-8	Acetonitrile	NR		NR		NR		NR		NR		NR	
141-78-6	Ethyl acetate	NR		NR		NR		NR		NR		NR	
1634-04-4	Methyl tert-butyl ether	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0023-40		039-G-0023-50		039-G-0023-60		039-G-0024-40		039-G-0024-50		039-G-0024-60	
	ORIGINAL ID ----->	039G002340		039G002350		039G002360		039G002440		039G002450		039G002460	
	LAB SAMPLE ID --->	11189810		11189811		11189812		11189813		11209803		11199803	
	ID FROM REPORT -->	039G002340		039G002350		039G002360		039G002440		039G002450		039G002460	
	SAMPLE DATE ----->	11/17/98		11/17/98		11/17/98		11/17/98		11/17/98		11/18/98	
	DATE ANALYZED --->	11/19/98		11/19/98		11/19/98		11/19/98		11/20/98		11/19/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0025-40		039-G-0025-50		039-G-0025-60		039-G-0026-40		039-G-0026-50		039-G-0026-60	
	ORIGINAL ID ----->	039G002540		039G002550		039G002560		039G002640		039G002650		039G002660	
	LAB SAMPLE ID --->	11199820		11199804		11199805		11199806		11199807		11199821	
	ID FROM REPORT -->	039G002540		039G002550		039G002560		039G002640		039G002650		039G002660	
	SAMPLE DATE ----->	11/18/98		11/18/98		11/18/98		11/18/98		11/18/98		11/19/98	
	DATE ANALYZED --->	11/20/98		11/19/98		11/19/98		11/19/98		11/19/98		11/20/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL
75-00-3	Chloroethane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
75-69-4	Trichlorofluoromethane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
75-35-4	1,1-Dichloroethene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
75-09-2	Methylene chloride	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
156-60-5	trans-1,2-Dichloroethene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
75-34-3	1,1-Dichloroethane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
594-20-7	2,2-Dichloropropane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
156-59-2	cis-1,2-Dichloroethene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
67-66-3	Chloroform	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
74-97-5	Chlorobromomethane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
71-55-6	1,1,1-Trichloroethane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
563-58-6	1,1-Dichloropropene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
56-23-5	Carbon tetrachloride	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
107-06-2	1,2-Dichloroethane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
71-43-2	Benzene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
79-01-6	Trichloroethene	2.	UJ	2.	UJ	2.	UJ	11.	J	2.	UJ	2.	UJ
78-87-5	1,2-Dichloropropane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
75-27-4	Bromodichloromethane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
74-95-3	Dibromomethane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
10061-01-5	cis-1,3-Dichloropropene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
108-88-3	Toluene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
10061-02-6	trans-1,3-Dichloropropene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
79-00-5	1,1,2-Trichloroethane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
142-28-9	1,3-Dichloropropane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
127-18-4	Tetrachloroethene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
124-48-1	Dibromochloromethane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
106-93-4	1,2-Dibromoethane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
108-90-7	Chlorobenzene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
100-41-4	Ethylbenzene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
630-20-6	1,1,1,2-Tetrachloroethane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
9999900-05-0	m+p Xylene	4.	UJ	4.	UJ	4.	UJ	4.	UJ	4.	UJ	4.	UJ
95-47-6	o-Xylene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
100-42-5	Styrene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
98-82-8	Benzene, 1-methylethyl-	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
75-25-2	Bromoform	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
79-34-5	1,1,2,2-Tetrachloroethane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
96-18-4	1,2,3-Trichloropropane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0025-40		039-G-0025-50		039-G-0025-60		039-G-0026-40		039-G-0026-50		039-G-0026-60	
	ORIGINAL ID ----->	039G002540		039G002550		039G002560		039G002640		039G002650		039G002660	
	LAB SAMPLE ID --->	11199820		11199804		11199805		11199806		11199807		11199821	
	ID FROM REPORT -->	039G002540		039G002550		039G002560		039G002640		039G002650		039G002660	
	SAMPLE DATE ----->	11/18/98		11/18/98		11/18/98		11/18/98		11/18/98		11/19/98	
	DATE ANALYZED --->	11/20/98		11/19/98		11/19/98		11/19/98		11/19/98		11/20/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL
103-65-1	n-Propylbenzene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
108-86-1	Bromobenzene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
108-67-8	Benzene, 1,3,5-trimethyl-	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
95-49-8	2-Chlorotoluene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
106-43-4	4-Chlorotoluene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
98-06-6	tert-Butylbenzene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
95-63-6	Benzene, 1,2,4-trimethyl	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
135-98-8	sec-Butylbenzene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
99-87-6	p-Isopropyltoluene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
541-73-1	1,3-Dichlorobenzene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
106-46-7	1,4-Dichlorobenzene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
104-51-8	n-Butylbenzene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
95-50-1	1,2-Dichlorobenzene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
96-12-8	1,2-Dibromo-3-Chloropropane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
120-82-1	1,2,4-Trichlorobenzene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
87-68-3	Hexachlorobutadiene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
91-20-3	Naphthalene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
87-61-6	1,2,3-Trichlorobenzene	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
75-71-8	Dichlorodifluoromethane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
74-87-3	Chloromethane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
75-01-4	Vinyl chloride	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
74-83-9	Bromomethane	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ	2.	UJ
67-64-1	Acetone	NR		NR		NR		NR		NR		NR	
107-02-8	Acrolein	NR		NR		NR		NR		NR		NR	
107-13-1	Acrylonitrile	NR		NR		NR		NR		NR		NR	
78-93-3	2-Butanone (MEK)	NR		NR		NR		NR		NR		NR	
75-15-0	Carbon disulfide	NR		NR		NR		NR		NR		NR	
110-75-8	2-Chloroethylvinylether	NR		NR		NR		NR		NR		NR	
591-78-6	2-Hexanone	NR		NR		NR		NR		NR		NR	
74-88-4	Methyl iodide	NR		NR		NR		NR		NR		NR	
108-10-1	4-Methyl-2-Pentanone (MIBK)	NR		NR		NR		NR		NR		NR	
108-05-4	Vinyl acetate	NR		NR		NR		NR		NR		NR	
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		NR		NR	
9999900-00-3	Isopropylbenzene	NR		NR		NR		NR		NR		NR	
75-05-8	Acetonitrile	NR		NR		NR		NR		NR		NR	
141-78-6	Ethyl acetate	NR		NR		NR		NR		NR		NR	
1634-04-4	Methyl tert-butyl ether	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0025-40		039-G-0025-50		039-G-0025-60		039-G-0026-40		039-G-0026-50		039-G-0026-60	
	ORIGINAL ID ----->	039G002540		039G002550		039G002560		039G002640		039G002650		039G002660	
	LAB SAMPLE ID --->	11199820		11199804		11199805		11199806		11199807		11199821	
	ID FROM REPORT -->	039G002540		039G002550		039G002560		039G002640		039G002650		039G002660	
	SAMPLE DATE ----->	11/18/98		11/18/98		11/18/98		11/18/98		11/18/98		11/19/98	
	DATE ANALYZED --->	11/20/98		11/19/98		11/19/98		11/19/98		11/19/98		11/20/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0027-40		039-H-0027-40		039-G-0027-50		039-G-0027-60		039-G-0028-40		039-G-0028-50	
	ORIGINAL ID ----->	039G002740		039H002740		039G002750		039G002760		039G002840		039G002850	
	LAB SAMPLE ID --->	11199822		11199823		11209805		11209808		11209809		11249816	
	ID FROM REPORT -->	039G002740		039H002740		039G002750		039G002760		039G002840		039G002850	
	SAMPLE DATE ----->	11/19/98		11/19/98		11/19/98		11/19/98		11/19/98		11/20/98	
	DATE ANALYZED --->	11/20/98		11/20/98		11/20/98		11/20/98		11/20/98		11/25/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL
75-00-3	Chloroethane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
75-69-4	Trichlorofluoromethane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
75-35-4	1,1-Dichloroethene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
75-09-2	Methylene chloride	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
156-60-5	trans-1,2-Dichloroethene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
75-34-3	1,1-Dichloroethane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
594-20-7	2,2-Dichloropropane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
156-59-2	cis-1,2-Dichloroethene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
67-66-3	Chloroform	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
74-97-5	Chlorobromomethane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
71-55-6	1,1,1-Trichloroethane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
563-58-6	1,1-Dichloropropene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
56-23-5	Carbon tetrachloride	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
107-06-2	1,2-Dichloroethane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
71-43-2	Benzene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
79-01-6	Trichloroethene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
78-87-5	1,2-Dichloropropane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
75-27-4	Bromodichloromethane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
74-95-3	Dibromomethane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
10061-01-5	cis-1,3-Dichloropropene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
108-88-3	Toluene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
10061-02-6	trans-1,3-Dichloropropene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
79-00-5	1,1,2-Trichloroethane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
142-28-9	1,3-Dichloropropane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
127-18-4	Tetrachloroethene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
124-48-1	Dibromochloromethane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
106-93-4	1,2-Dibromoethane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
108-90-7	Chlorobenzene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
100-41-4	Ethylbenzene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
630-20-6	1,1,1,2-Tetrachloroethane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
9999900-05-0	m+p Xylene	4.	UJ	4.	UJ	4.	U	4.	UJ	4.	UJ	4.	U
95-47-6	o-Xylene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
100-42-5	Styrene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
98-82-8	Benzene, 1-methylethyl-	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
75-25-2	Bromoform	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
79-34-5	1,1,2,2-Tetrachloroethane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
96-18-4	1,2,3-Trichloropropane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0027-40		039-H-0027-40		039-G-0027-50		039-G-0027-60		039-G-0028-40		039-G-0028-50	
	ORIGINAL ID ----->	039G002740		039H002740		039G002750		039G002760		039G002840		039G002850	
	LAB SAMPLE ID --->	11199822		11199823		11209805		11209808		11209809		11249816	
	ID FROM REPORT -->	039G002740		039H002740		039G002750		039G002760		039G002840		039G002850	
	SAMPLE DATE ----->	11/19/98		11/19/98		11/19/98		11/19/98		11/19/98		11/20/98	
	DATE ANALYZED --->	11/20/98		11/20/98		11/20/98		11/20/98		11/20/98		11/25/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL
103-65-1	n-Propylbenzene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
108-86-1	Bromobenzene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
108-67-8	Benzene, 1,3,5-trimethyl-	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
95-49-8	2-Chlorotoluene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
106-43-4	4-Chlorotoluene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
98-06-6	tert-Butylbenzene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
95-63-6	Benzene, 1,2,4-trimethyl	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
135-98-8	sec-Butylbenzene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
99-87-6	p-Isopropyltoluene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
541-73-1	1,3-Dichlorobenzene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
106-46-7	1,4-Dichlorobenzene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
104-51-8	n-Butylbenzene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
95-50-1	1,2-Dichlorobenzene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
120-82-1	1,2,4-Trichlorobenzene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
87-68-3	Hexachlorobutadiene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
91-20-3	Naphthalene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
87-61-6	1,2,3-Trichlorobenzene	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
75-71-8	Dichlorodifluoromethane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
74-87-3	Chloromethane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
75-01-4	Vinyl chloride	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
74-83-9	Bromomethane	2.	UJ	2.	UJ	2.	U	2.	UJ	2.	UJ	2.	U
67-64-1	Acetone	NR		NR		NR		NR		NR		NR	
107-02-8	Acrolein	NR		NR		NR		NR		NR		NR	
107-13-1	Acrylonitrile	NR		NR		NR		NR		NR		NR	
78-93-3	2-Butanone (MEK)	NR		NR		NR		NR		NR		NR	
75-15-0	Carbon disulfide	NR		NR		NR		NR		NR		NR	
110-75-8	2-Chloroethylvinylether	NR		NR		NR		NR		NR		NR	
591-78-6	2-Hexanone	NR		NR		NR		NR		NR		NR	
74-88-4	Methyl iodide	NR		NR		NR		NR		NR		NR	
108-10-1	4-Methyl-2-Pentanone (MIBK)	NR		NR		NR		NR		NR		NR	
108-05-4	Vinyl acetate	NR		NR		NR		NR		NR		NR	
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		NR		NR	
9999900-00-3	Isopropylbenzene	NR		NR		NR		NR		NR		NR	
75-05-8	Acetonitrile	NR		NR		NR		NR		NR		NR	
141-78-6	Ethyl acetate	NR		NR		NR		NR		NR		NR	
1634-04-4	Methyl tert-butyl ether	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0027-40		039-H-0027-40		039-G-0027-50		039-G-0027-60		039-G-0028-40		039-G-0028-50	
	ORIGINAL ID ----->	039G002740		039H002740		039G002750		039G002760		039G002840		039G002850	
	LAB SAMPLE ID --->	11199822		11199823		11209805		11209808		11209809		11249816	
	ID FROM REPORT -->	039G002740		039H002740		039G002750		039G002760		039G002840		039G002850	
	SAMPLE DATE ----->	11/19/98		11/19/98		11/19/98		11/19/98		11/19/98		11/20/98	
	DATE ANALYZED --->	11/20/98		11/20/98		11/20/98		11/20/98		11/20/98		11/25/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA															
	SAMPLE ID ------->	039-G-0028-60		039-G-0029-40		039-G-0029-50		039-G-0030-40		039-G-0030-50		039-G-0030-60	
	ORIGINAL ID ----->	039G002860		039G002940		039G002950		039G003040		039G003050		039G003060	
	LAB SAMPLE ID --->	11249817		11249818		11249819		11219803		11219804		11219805	
	ID FROM REPORT -->	039G002860		039G002940		039G002950		039G003040		039G003050		039G003060	
	SAMPLE DATE ----->	11/20/98		11/20/98		11/20/98		11/20/98		11/20/98		11/21/98	
	DATE ANALYZED --->	11/25/98		11/25/98		11/25/98		11/21/98		11/21/98		11/21/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL
75-00-3	Chloroethane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
75-69-4	Trichlorofluoromethane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
75-35-4	1,1-Dichloroethene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
75-09-2	Methylene chloride	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
156-60-5	trans-1,2-Dichloroethene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
75-34-3	1,1-Dichloroethane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
594-20-7	2,2-Dichloropropane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
156-59-2	cis-1,2-Dichloroethene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
67-66-3	Chloroform	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
74-97-5	Chlorobromomethane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
71-55-6	1,1,1-Trichloroethane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
563-58-6	1,1-Dichloropropene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
56-23-5	Carbon tetrachloride	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
107-06-2	1,2-Dichloroethane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
71-43-2	Benzene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
79-01-6	Trichloroethene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
78-87-5	1,2-Dichloropropane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
75-27-4	Bromodichloromethane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
74-95-3	Dibromomethane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
10061-01-5	cis-1,3-Dichloropropene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
108-88-3	Toluene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
10061-02-6	trans-1,3-Dichloropropene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
79-00-5	1,1,2-Trichloroethane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
142-28-9	1,3-Dichloropropane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
127-18-4	Tetrachloroethene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
124-48-1	Dibromochloromethane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
106-93-4	1,2-Dibromoethane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
108-90-7	Chlorobenzene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
100-41-4	Ethylbenzene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
630-20-6	1,1,1,2-Tetrachloroethane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
9999900-05-0	m+p Xylene	4.	U	4.	U	4.	U	4.	UJ	4.	U	4.	U
95-47-6	o-Xylene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
100-42-5	Styrene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
98-82-8	Benzene, 1-methylethyl-	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
75-25-2	Bromoform	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
79-34-5	1,1,2,2-Tetrachloroethane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
96-18-4	1,2,3-Trichloropropane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0028-60		039-G-0029-40		039-G-0029-50		039-G-0030-40		039-G-0030-50		039-G-0030-60	
	ORIGINAL ID ----->	039G002860		039G002940		039G002950		039G003040		039G003050		039G003060	
	LAB SAMPLE ID --->	11249817		11249818		11249819		11219803		11219804		11219805	
	ID FROM REPORT -->	039G002860		039G002940		039G002950		039G003040		039G003050		039G003060	
	SAMPLE DATE ----->	11/20/98		11/20/98		11/20/98		11/20/98		11/20/98		11/21/98	
	DATE ANALYZED --->	11/25/98		11/25/98		11/25/98		11/21/98		11/21/98		11/21/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL
103-65-1	n-Propylbenzene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
108-86-1	Bromobenzene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
108-67-8	Benzene, 1,3,5-trimethyl-	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
95-49-8	2-Chlorotoluene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
106-43-4	4-Chlorotoluene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
98-06-6	tert-Butylbenzene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
95-63-6	Benzene, 1,2,4-trimethyl	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
135-98-8	sec-Butylbenzene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
99-87-6	p-Isopropyltoluene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
541-73-1	1,3-Dichlorobenzene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
106-46-7	1,4-Dichlorobenzene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
104-51-8	n-Butylbenzene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
95-50-1	1,2-Dichlorobenzene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
120-82-1	1,2,4-Trichlorobenzene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
87-68-3	Hexachlorobutadiene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
91-20-3	Naphthalene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
87-61-6	1,2,3-Trichlorobenzene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
75-71-8	Dichlorodifluoromethane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
74-87-3	Chloromethane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
75-01-4	Vinyl chloride	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
74-83-9	Bromomethane	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	U
67-64-1	Acetone	NR		NR		NR		NR		NR		NR	
107-02-8	Acrolein	NR		NR		NR		NR		NR		NR	
107-13-1	Acrylonitrile	NR		NR		NR		NR		NR		NR	
78-93-3	2-Butanone (MEK)	NR		NR		NR		NR		NR		NR	
75-15-0	Carbon disulfide	NR		NR		NR		NR		NR		NR	
110-75-8	2-Chloroethylvinylether	NR		NR		NR		NR		NR		NR	
591-78-6	2-Hexanone	NR		NR		NR		NR		NR		NR	
74-88-4	Methyl iodide	NR		NR		NR		NR		NR		NR	
108-10-1	4-Methyl-2-Pentanone (MIBK)	NR		NR		NR		NR		NR		NR	
108-05-4	Vinyl acetate	NR		NR		NR		NR		NR		NR	
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		NR		NR	
9999900-00-3	Isopropylbenzene	NR		NR		NR		NR		NR		NR	
75-05-8	Acetonitrile	NR		NR		NR		NR		NR		NR	
141-78-6	Ethyl acetate	NR		NR		NR		NR		NR		NR	
1634-04-4	Methyl tert-butyl ether	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0028-60		039-G-0029-40		039-G-0029-50		039-G-0030-40		039-G-0030-50		039-G-0030-60	
	ORIGINAL ID ----->	039G002860		039G002940		039G002950		039G003040		039G003050		039G003060	
	LAB SAMPLE ID --->	11249817		11249818		11249819		11219803		11219804		11219805	
	ID FROM REPORT -->	039G002860		039G002940		039G002950		039G003040		039G003050		039G003060	
	SAMPLE DATE ----->	11/20/98		11/20/98		11/20/98		11/20/98		11/20/98		11/21/98	
	DATE ANALYZED --->	11/25/98		11/25/98		11/25/98		11/21/98		11/21/98		11/21/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0031-40		039-G-0031-50		039-G-0031-60		039-G-0032-40		039-G-0032-50		039-G-0032-60	
	ORIGINAL ID ----->	039G003140		039G003150		039G003160		039G003240		039G003250		039G003260	
	LAB SAMPLE ID --->	11249820		11249835		11249836		11249837		11229803		11229820	
	ID FROM REPORT -->	039G003140		039G003150		039G003160		039G003240		039G003250		039G003260	
	SAMPLE DATE ----->	11/21/98		11/21/98		11/21/98		11/21/98		11/21/98		11/22/98	
	DATE ANALYZED --->	11/25/98		11/25/98		11/25/98		11/25/98		11/22/98		11/23/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL
75-00-3	Chloroethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
75-69-4	Trichlorofluoromethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
75-35-4	1,1-Dichloroethene	2.	U	2.	U	2.	U	2.	UJ	2.	U	2.	UJ
75-09-2	Methylene chloride	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
156-60-5	trans-1,2-Dichloroethene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
75-34-3	1,1-Dichloroethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
594-20-7	2,2-Dichloropropane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
156-59-2	cis-1,2-Dichloroethene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
67-66-3	Chloroform	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
74-97-5	Chlorobromomethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
71-55-6	1,1,1-Trichloroethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
563-58-6	1,1-Dichloropropene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
56-23-5	Carbon tetrachloride	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
107-06-2	1,2-Dichloroethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
71-43-2	Benzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
79-01-6	Trichloroethene	2.	U	2.	U	2.	U	2.	U	3.	J	2.	UJ
78-87-5	1,2-Dichloropropane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
75-27-4	Bromodichloromethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
74-95-3	Dibromomethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
10061-01-5	cis-1,3-Dichloropropene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
108-88-3	Toluene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
10061-02-6	trans-1,3-Dichloropropene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
79-00-5	1,1,2-Trichloroethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
142-28-9	1,3-Dichloropropane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
127-18-4	Tetrachloroethene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
124-48-1	Dibromochloromethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
106-93-4	1,2-Dibromoethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
108-90-7	Chlorobenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
100-41-4	Ethylbenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
630-20-6	1,1,1,2-Tetrachloroethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
9999900-05-0	m+p Xylene	4.	U	4.	U	4.	U	4.	U	4.	U	4.	UJ
95-47-6	o-Xylene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
100-42-5	Styrene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
98-82-8	Benzene, 1-methylethyl-	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
75-25-2	Bromoform	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
79-34-5	1,1,2,2-Tetrachloroethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
96-18-4	1,2,3-Trichloropropane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0031-40		039-G-0031-50		039-G-0031-60		039-G-0032-40		039-G-0032-50		039-G-0032-60	
	ORIGINAL ID ----->	039G003140		039G003150		039G003160		039G003240		039G003250		039G003260	
	LAB SAMPLE ID --->	11249820		11249835		11249836		11249837		11229803		11229820	
	ID FROM REPORT -->	039G003140		039G003150		039G003160		039G003240		039G003250		039G003260	
	SAMPLE DATE ----->	11/21/98		11/21/98		11/21/98		11/21/98		11/21/98		11/22/98	
	DATE ANALYZED --->	11/25/98		11/25/98		11/25/98		11/25/98		11/22/98		11/23/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL
103-65-1	n-Propylbenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
108-86-1	Bromobenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
108-67-8	Benzene, 1,3,5-trimethyl-	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
95-49-8	2-Chlorotoluene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
106-43-4	4-Chlorotoluene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
98-06-6	tert-Butylbenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
95-63-6	Benzene, 1,2,4-trimethyl	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
135-98-8	sec-Butylbenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
99-87-6	p-Isopropyltoluene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
541-73-1	1,3-Dichlorobenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
106-46-7	1,4-Dichlorobenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
104-51-8	n-Butylbenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
95-50-1	1,2-Dichlorobenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
96-12-8	1,2-Dibromo-3-Chloropropane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
120-82-1	1,2,4-Trichlorobenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
87-68-3	Hexachlorobutadiene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
91-20-3	Naphthalene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
87-61-6	1,2,3-Trichlorobenzene	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
75-71-8	Dichlorodifluoromethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
74-87-3	Chloromethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
75-01-4	Vinyl chloride	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
74-83-9	Bromomethane	2.	U	2.	U	2.	U	2.	U	2.	U	2.	UJ
67-64-1	Acetone	NR		NR		NR		NR		NR		NR	
107-02-8	Acrolein	NR		NR		NR		NR		NR		NR	
107-13-1	Acrylonitrile	NR		NR		NR		NR		NR		NR	
78-93-3	2-Butanone (MEK)	NR		NR		NR		NR		NR		NR	
75-15-0	Carbon disulfide	NR		NR		NR		NR		NR		NR	
110-75-8	2-Chloroethylvinylether	NR		NR		NR		NR		NR		NR	
591-78-6	2-Hexanone	NR		NR		NR		NR		NR		NR	
74-88-4	Methyl iodide	NR		NR		NR		NR		NR		NR	
108-10-1	4-Methyl-2-Pentanone (MIBK)	NR		NR		NR		NR		NR		NR	
108-05-4	Vinyl acetate	NR		NR		NR		NR		NR		NR	
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		NR		NR	
9999900-00-3	Isopropylbenzene	NR		NR		NR		NR		NR		NR	
75-05-8	Acetonitrile	NR		NR		NR		NR		NR		NR	
141-78-6	Ethyl acetate	NR		NR		NR		NR		NR		NR	
1634-04-4	Methyl tert-butyl ether	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0031-40		039-G-0031-50		039-G-0031-60		039-G-0032-40		039-G-0032-50		039-G-0032-60	
	ORIGINAL ID ----->	039G003140		039G003150		039G003160		039G003240		039G003250		039G003260	
	LAB SAMPLE ID --->	11249820		11249835		11249836		11249837		11229803		11229820	
	ID FROM REPORT -->	039G003140		039G003150		039G003160		039G003240		039G003250		039G003260	
	SAMPLE DATE ----->	11/21/98		11/21/98		11/21/98		11/21/98		11/21/98		11/22/98	
	DATE ANALYZED --->	11/25/98		11/25/98		11/25/98		11/25/98		11/22/98		11/23/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA															
	SAMPLE ID ------->	039-G-0033-40		039-G-0033-50		039-G-0034-40		039-G-0034-50		039-H-0034-50		039-G-0035-44	
	ORIGINAL ID ----->	039G003340		039G003350		039G003440		039G003450		039H003450		039G003544	
	LAB SAMPLE ID --->	11229819		11229827		11229828		11229829		11229830		11229839	
	ID FROM REPORT -->	039G003340		039G003350		039G003440		039G003450		039H003450		039G003544	
	SAMPLE DATE ----->	11/22/98		11/22/98		11/22/98		11/23/98		11/23/98		11/23/98	
	DATE ANALYZED --->	11/23/98		11/23/98		11/23/98		11/23/98		11/23/98		11/23/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL
75-00-3	Chloroethane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
75-69-4	Trichlorofluoromethane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
75-35-4	1,1-Dichloroethene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
75-09-2	Methylene chloride	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
156-60-5	trans-1,2-Dichloroethene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
75-34-3	1,1-Dichloroethane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
594-20-7	2,2-Dichloropropane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
156-59-2	cis-1,2-Dichloroethene	6.	J	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
67-66-3	Chloroform	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
74-97-5	Chlorobromomethane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
71-55-6	1,1,1-Trichloroethane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
563-58-6	1,1-Dichloropropene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
56-23-5	Carbon tetrachloride	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
107-06-2	1,2-Dichloroethane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
71-43-2	Benzene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
79-01-6	Trichloroethene	37.	J	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
78-87-5	1,2-Dichloropropane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
75-27-4	Bromodichloromethane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
74-95-3	Dibromomethane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
10061-01-5	cis-1,3-Dichloropropene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
108-88-3	Toluene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
10061-02-6	trans-1,3-Dichloropropene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
79-00-5	1,1,2-Trichloroethane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
142-28-9	1,3-Dichloropropane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
127-18-4	Tetrachloroethene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
124-48-1	Dibromochloromethane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
106-93-4	1,2-Dibromoethane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
108-90-7	Chlorobenzene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
100-41-4	Ethylbenzene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
630-20-6	1,1,1,2-Tetrachloroethane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
9999900-05-0	m+p Xylene	4.	UJ	4.	UJ	4.	U	4.	U	4.	U	4.	UJ
95-47-6	o-Xylene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
100-42-5	Styrene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
98-82-8	Benzene, 1-methylethyl-	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
75-25-2	Bromoform	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
79-34-5	1,1,2,2-Tetrachloroethane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
96-18-4	1,2,3-Trichloropropane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0033-40		039-G-0033-50		039-G-0034-40		039-G-0034-50		039-H-0034-50		039-G-0035-44	
	ORIGINAL ID ----->	039G003340		039G003350		039G003440		039G003450		039H003450		039G003544	
	LAB SAMPLE ID --->	11229819		11229827		11229828		11229829		11229830		11229839	
	ID FROM REPORT -->	039G003340		039G003350		039G003440		039G003450		039H003450		039G003544	
	SAMPLE DATE ----->	11/22/98		11/22/98		11/22/98		11/23/98		11/23/98		11/23/98	
	DATE ANALYZED --->	11/23/98		11/23/98		11/23/98		11/23/98		11/23/98		11/23/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL
103-65-1	n-Propylbenzene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
108-86-1	Bromobenzene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
108-67-8	Benzene, 1,3,5-trimethyl-	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
95-49-8	2-Chlorotoluene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
106-43-4	4-Chlorotoluene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
98-06-6	tert-Butylbenzene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
95-63-6	Benzene, 1,2,4-trimethyl	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
135-98-8	sec-Butylbenzene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
99-87-6	p-Isopropyltoluene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
541-73-1	1,3-Dichlorobenzene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
106-46-7	1,4-Dichlorobenzene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
104-51-8	n-Butylbenzene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
95-50-1	1,2-Dichlorobenzene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
96-12-8	1,2-Dibromo-3-Chloropropane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
120-82-1	1,2,4-Trichlorobenzene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
87-68-3	Hexachlorobutadiene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
91-20-3	Naphthalene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
87-61-6	1,2,3-Trichlorobenzene	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
75-71-8	Dichlorodifluoromethane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
74-87-3	Chloromethane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
75-01-4	Vinyl chloride	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
74-83-9	Bromomethane	2.	UJ	2.	UJ	2.	U	2.	U	2.	U	2.	UJ
67-64-1	Acetone	NR		NR		NR		NR		NR		NR	
107-02-8	Acrolein	NR		NR		NR		NR		NR		NR	
107-13-1	Acrylonitrile	NR		NR		NR		NR		NR		NR	
78-93-3	2-Butanone (MEK)	NR		NR		NR		NR		NR		NR	
75-15-0	Carbon disulfide	NR		NR		NR		NR		NR		NR	
110-75-8	2-Chloroethylvinylether	NR		NR		NR		NR		NR		NR	
591-78-6	2-Hexanone	NR		NR		NR		NR		NR		NR	
74-88-4	Methyl iodide	NR		NR		NR		NR		NR		NR	
108-10-1	4-Methyl-2-Pentanone (MIBK)	NR		NR		NR		NR		NR		NR	
108-05-4	Vinyl acetate	NR		NR		NR		NR		NR		NR	
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		NR		NR	
9999900-00-3	Isopropylbenzene	NR		NR		NR		NR		NR		NR	
75-05-8	Acetonitrile	NR		NR		NR		NR		NR		NR	
141-78-6	Ethyl acetate	NR		NR		NR		NR		NR		NR	
1634-04-4	Methyl tert-butyl ether	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0033-40		039-G-0033-50		039-G-0034-40		039-G-0034-50		039-H-0034-50		039-G-0035-44	
	ORIGINAL ID ----->	039G003340		039G003350		039G003440		039G003450		039H003450		039G003544	
	LAB SAMPLE ID --->	11229819		11229827		11229828		11229829		11229830		11229839	
	ID FROM REPORT -->	039G003340		039G003350		039G003440		039G003450		039H003450		039G003544	
	SAMPLE DATE ----->	11/22/98		11/22/98		11/22/98		11/23/98		11/23/98		11/23/98	
	DATE ANALYZED --->	11/23/98		11/23/98		11/23/98		11/23/98		11/23/98		11/23/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0035-55		039-G-0036-40		039-G-0036-50		039-G-0036-60		039-G-0037-40		039-G-0037-50	
	ORIGINAL ID ----->	039G003555		039G003640		039G003650		039G003660		039G003740		039G003750	
	LAB SAMPLE ID --->	11229840		11249824		11249823		11249825		9812068-04		9812068-02	
	ID FROM REPORT -->	039G003555		039G003640		039G003650		039G003660		039G003740		039G003750	
	SAMPLE DATE ----->	11/23/98		11/24/98		11/24/98		11/24/98		12/01/98		12/01/98	
	DATE ANALYZED --->	11/23/98		11/25/98		11/25/98		11/25/98		12/03/98		12/03/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	9812068	VAL	9812068	VAL
75-00-3	Chloroethane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
75-69-4	Trichlorofluoromethane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
75-35-4	1,1-Dichloroethene	2.	U	2.	U	2.	U	2.	UJ	1.	U	1.	U
75-09-2	Methylene chloride	2.	U	2.	U	2.	U	2.	U	20.	UJ	20.	UJ
156-60-5	trans-1,2-Dichloroethene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
75-34-3	1,1-Dichloroethane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
594-20-7	2,2-Dichloropropane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
156-59-2	cis-1,2-Dichloroethene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
67-66-3	Chloroform	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
74-97-5	Chlorobromomethane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
71-55-6	1,1,1-Trichloroethane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
563-58-6	1,1-Dichloropropene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
56-23-5	Carbon tetrachloride	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
71-43-2	Benzene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
79-01-6	Trichloroethene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
78-87-5	1,2-Dichloropropane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
74-95-3	Dibromomethane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
108-88-3	Toluene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
10061-02-6	trans-1,3-Dichloropropene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
142-28-9	1,3-Dichloropropane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
127-18-4	Tetrachloroethene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
124-48-1	Dibromochloromethane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
106-93-4	1,2-Dibromoethane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
108-90-7	Chlorobenzene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
100-41-4	Ethylbenzene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
630-20-6	1,1,1,2-Tetrachloroethane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
9999900-05-0	m+p Xylene	4.	U	4.	U	4.	U	4.	U	1.	U	1.	U
95-47-6	o-Xylene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
100-42-5	Styrene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
98-82-8	Benzene, 1-methylethyl-	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
75-25-2	Bromoform	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
96-18-4	1,2,3-Trichloropropane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0035-55		039-G-0036-40		039-G-0036-50		039-G-0036-60		039-G-0037-40		039-G-0037-50	
	ORIGINAL ID ----->	039G003555		039G003640		039G003650		039G003660		039G003740		039G003750	
	LAB SAMPLE ID --->	11229840		11249824		11249823		11249825		9812068-04		9812068-02	
	ID FROM REPORT -->	039G003555		039G003640		039G003650		039G003660		039G003740		039G003750	
	SAMPLE DATE ----->	11/23/98		11/24/98		11/24/98		11/24/98		12/01/98		12/01/98	
	DATE ANALYZED --->	11/23/98		11/25/98		11/25/98		11/25/98		12/03/98		12/03/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	9812068	VAL	9812068	VAL
103-65-1	n-Propylbenzene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
108-86-1	Bromobenzene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
108-67-8	Benzene, 1,3,5-trimethyl-	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
95-49-8	2-Chlorotoluene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
106-43-4	4-Chlorotoluene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
98-06-6	tert-Butylbenzene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
95-63-6	Benzene, 1,2,4-trimethyl	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
135-98-8	sec-Butylbenzene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
99-87-6	p-Isopropyltoluene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
104-51-8	n-Butylbenzene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
120-82-1	1,2,4-Trichlorobenzene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
87-68-3	Hexachlorobutadiene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
91-20-3	Naphthalene	2.	U	2.	U	3.	U	2.	U	1.	U	1.	U
87-61-6	1,2,3-Trichlorobenzene	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
74-87-3	Chloromethane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
75-01-4	Vinyl chloride	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
74-83-9	Bromomethane	2.	U	2.	U	2.	U	2.	U	1.	U	1.	U
67-64-1	Acetone	NR		NR		NR		NR		20.	U	20.	U
107-02-8	Acrolein	NR		NR		NR		NR		20.	U	20.	U
107-13-1	Acrylonitrile	NR		NR		NR		NR		20.	U	20.	U
78-93-3	2-Butanone (MEK)	NR		NR		NR		NR		20.	U	20.	U
75-15-0	Carbon disulfide	NR		NR		NR		NR		1.	U	1.	U
110-75-8	2-Chloroethylvinylether	NR		NR		NR		NR		20.	U	20.	U
591-78-6	2-Hexanone	NR		NR		NR		NR		5.	U	5.	U
74-88-4	Methyl iodide	NR		NR		NR		NR		1.	U	1.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	NR		NR		NR		NR		5.	U	5.	U
108-05-4	Vinyl acetate	NR		NR		NR		NR		20.	U	20.	U
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		NR		NR	
9999900-00-3	Isopropylbenzene	NR		NR		NR		NR		NR		NR	
75-05-8	Acetonitrile	NR		NR		NR		NR		NR		NR	
141-78-6	Ethyl acetate	NR		NR		NR		NR		NR		NR	
1634-04-4	Methyl tert-butyl ether	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0035-55		039-G-0036-40		039-G-0036-50		039-G-0036-60		039-G-0037-40		039-G-0037-50	
	ORIGINAL ID ----->	039G003555		039G003640		039G003650		039G003660		039G003740		039G003750	
	LAB SAMPLE ID --->	11229840		11249824		11249823		11249825		9812068-04		9812068-02	
	ID FROM REPORT -->	039G003555		039G003640		039G003650		039G003660		039G003740		039G003750	
	SAMPLE DATE ----->	11/23/98		11/24/98		11/24/98		11/24/98		12/01/98		12/01/98	
	DATE ANALYZED --->	11/23/98		11/25/98		11/25/98		11/25/98		12/03/98		12/03/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	0001B	VAL	0001B	VAL	0001B	VAL	0001B	VAL	9812068	VAL	9812068	VAL
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0037-60		039-G-0038-40		039-G-0038-50		039-G-0038-60		039-G-0039-40		039-G-0039-50	
	ORIGINAL ID ----->	039G003760		039G003840		039G003850		039G003860		039G003940		039G003950	
	LAB SAMPLE ID --->	9812068-03		9812068-01		9812133-01		9812133-02		9812240-02		9812240-01	
	ID FROM REPORT -->	039G003760		039G003840		039G003850		039G003860		039G003940		039G003950	
	SAMPLE DATE ----->	12/01/98		12/01/98		12/02/98		12/02/98		12/03/98		12/03/98	
	DATE ANALYZED --->	12/03/98		12/03/98		12/04/98		12/04/98		12/05/98		12/05/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9812068	VAL	9812068	VAL	9812133	VAL	9812133	VAL	9812240	VAL	9812240	VAL
75-00-3	Chloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-09-2	Methylene chloride	20.	UJ	20.	UJ	20.	U	20.	U	20.	U	20.	U
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
594-20-7	2,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-59-2	cis-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-97-5	Chlorobromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
563-58-6	1,1-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
56-23-5	Carbon tetrachloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-43-2	Benzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-01-6	Trichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-95-3	Dibromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-88-3	Toluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
142-28-9	1,3-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
127-18-4	Tetrachloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-93-4	1,2-Dibromoethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-90-7	Chlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-41-4	Ethylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
630-20-6	1,1,1,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
9999900-05-0	m+p Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-47-6	o-Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-42-5	Styrene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-82-8	Benzene, 1-methylethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-25-2	Bromoform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0037-60		039-G-0038-40		039-G-0038-50		039-G-0038-60		039-G-0039-40		039-G-0039-50	
	ORIGINAL ID ----->	039G003760		039G003840		039G003850		039G003860		039G003940		039G003950	
	LAB SAMPLE ID --->	9812068-03		9812068-01		9812133-01		9812133-02		9812240-02		9812240-01	
	ID FROM REPORT -->	039G003760		039G003840		039G003850		039G003860		039G003940		039G003950	
	SAMPLE DATE ----->	12/01/98		12/01/98		12/02/98		12/02/98		12/03/98		12/03/98	
	DATE ANALYZED --->	12/03/98		12/03/98		12/04/98		12/04/98		12/05/98		12/05/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9812068	VAL	9812068	VAL	9812133	VAL	9812133	VAL	9812240	VAL	9812240	VAL
103-65-1	n-Propylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-86-1	Bromobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-67-8	Benzene, 1,3,5-trimethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-49-8	2-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-43-4	4-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-06-6	tert-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-63-6	Benzene, 1,2,4-trimethyl	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
135-98-8	sec-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
99-87-6	p-Isopropyltoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
104-51-8	n-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-12-8	1,2-Dibromo-3-Chloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-68-3	Hexachlorobutadiene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
91-20-3	Naphthalene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-64-1	Acetone	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-02-8	Acrolein	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-13-1	Acrylonitrile	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
78-93-3	2-Butanone (MEK)	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
75-15-0	Carbon disulfide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
110-75-8	2-Chloroethylvinylether	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
74-88-4	Methyl iodide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-05-4	Vinyl acetate	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		NR		NR	
9999900-00-3	Isopropylbenzene	NR		NR		NR		NR		NR		NR	
75-05-8	Acetonitrile	NR		NR		NR		NR		NR		NR	
141-78-6	Ethyl acetate	NR		NR		NR		NR		NR		NR	
1634-04-4	Methyl tert-butyl ether	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0037-60		039-G-0038-40		039-G-0038-50		039-G-0038-60		039-G-0039-40		039-G-0039-50	
	ORIGINAL ID ----->	039G003760		039G003840		039G003850		039G003860		039G003940		039G003950	
	LAB SAMPLE ID --->	9812068-03		9812068-01		9812133-01		9812133-02		9812240-02		9812240-01	
	ID FROM REPORT -->	039G003760		039G003840		039G003850		039G003860		039G003940		039G003950	
	SAMPLE DATE ----->	12/01/98		12/01/98		12/02/98		12/02/98		12/03/98		12/03/98	
	DATE ANALYZED --->	12/03/98		12/03/98		12/04/98		12/04/98		12/05/98		12/05/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9812068	VAL	9812068	VAL	9812133	VAL	9812133	VAL	9812240	VAL	9812240	VAL
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0039-60		039-G-0040-40		039-G-0040-50		039-H-0040-50		039-G-0041-40		039-G-0041-50	
	ORIGINAL ID ----->	039G003960		039G004040		039G004050		039H004050		039G004140		039G004150	
	LAB SAMPLE ID --->	9812240-03		9812241-01		9812241-02		9812241-03		9812328-01		9812328-02	
	ID FROM REPORT -->	039G003960		039G004040		039G004050		039H004050		039G004140		039G004150	
	SAMPLE DATE ----->	12/03/98		12/04/98		12/04/98		12/04/98		12/07/98		12/07/98	
	DATE ANALYZED --->	12/05/98		12/05/98		12/05/98		12/05/98		12/09/98		12/09/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9812240	VAL	9812241	VAL	9812241	VAL	9812241	VAL	9812328	VAL	9812328	VAL
75-00-3	Chloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-09-2	Methylene chloride	20.	U	20.	U	20.	U	20.	U	20.	UJ	20.	UJ
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
594-20-7	2,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-59-2	cis-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-97-5	Chlorobromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
563-58-6	1,1-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
56-23-5	Carbon tetrachloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-43-2	Benzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-01-6	Trichloroethene	1.	U	1.	U	1.2	J	1.	UJ	1.	U	91.3	
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-95-3	Dibromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-88-3	Toluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
142-28-9	1,3-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
127-18-4	Tetrachloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-93-4	1,2-Dibromoethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-90-7	Chlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-41-4	Ethylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
630-20-6	1,1,1,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
9999900-05-0	m+p Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-47-6	o-Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-42-5	Styrene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-82-8	Benzene, 1-methylethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-25-2	Bromoform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0039-60		039-G-0040-40		039-G-0040-50		039-H-0040-50		039-G-0041-40		039-G-0041-50	
	ORIGINAL ID ----->	039G003960		039G004040		039G004050		039H004050		039G004140		039G004150	
	LAB SAMPLE ID --->	9812240-03		9812241-01		9812241-02		9812241-03		9812328-01		9812328-02	
	ID FROM REPORT -->	039G003960		039G004040		039G004050		039H004050		039G004140		039G004150	
	SAMPLE DATE ----->	12/03/98		12/04/98		12/04/98		12/04/98		12/07/98		12/07/98	
	DATE ANALYZED --->	12/06/98		12/05/98		12/05/98		12/05/98		12/09/98		12/09/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9812240	VAL	9812241	VAL	9812241	VAL	9812241	VAL	9812328	VAL	9812328	VAL
103-65-1	n-Propylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-86-1	Bromobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-67-8	Benzene, 1,3,5-trimethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-49-8	2-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-43-4	4-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-06-6	tert-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-63-6	Benzene, 1,2,4-trimethyl	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
135-98-8	sec-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
99-87-6	p-Isopropyltoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
104-51-8	n-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-12-8	1,2-Dibromo-3-Chloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-68-3	Hexachlorobutadiene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
91-20-3	Naphthalene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-64-1	Acetone	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-02-8	Acrolein	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-13-1	Acrylonitrile	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
78-93-3	2-Butanone (MEK)	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
75-15-0	Carbon disulfide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
110-75-8	2-Chloroethylvinylether	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
74-88-4	Methyl iodide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-05-4	Vinyl acetate	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		NR		NR	
9999900-00-3	Isopropylbenzene	NR		NR		NR		NR		NR		NR	
75-05-8	Acetonitrile	NR		NR		NR		NR		NR		NR	
141-78-6	Ethyl acetate	NR		NR		NR		NR		NR		NR	
1634-04-4	Methyl tert-butyl ether	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0039-60		039-G-0040-40		039-G-0040-50		039-H-0040-50		039-G-0041-40		039-G-0041-50	
	ORIGINAL ID ----->	039G003960		039G004040		039G004050		039H004050		039G004140		039G004150	
	LAB SAMPLE ID --->	9812240-03		9812241-01		9812241-02		9812241-03		9812328-01		9812328-02	
	ID FROM REPORT -->	039G003960		039G004040		039G004050		039H004050		039G004140		039G004150	
	SAMPLE DATE ----->	12/03/98		12/04/98		12/04/98		12/04/98		12/07/98		12/07/98	
	DATE ANALYZED --->	12/05/98		12/05/98		12/05/98		12/05/98		12/09/98		12/09/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9812240	VAL	9812241	VAL	9812241	VAL	9812241	VAL	9812328	VAL	9812328	VAL
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0041-60		039-G-0042-40		039-G-0042-50		039-G-0042-60		039-G-0043-50		039-G-0043-60	
	ORIGINAL ID ----->	039G004160		039G004240		039G004250		039G004260		039G004350		039G004260	
	LAB SAMPLE ID --->	9812328-03		9812405-02		9812405-01		9812405-03		9812405-04		9812405-05	
	ID FROM REPORT -->	039G004160		039G004240		039G004250		039G004260		039G004350		039G004260	
	SAMPLE DATE ----->	12/07/98		12/09/98		12/09/98		12/09/98		12/09/98		12/09/98	
	DATE EXTRACTED -->			12/10/98		12/10/98		12/10/98		12/10/98		12/10/98	
	DATE ANALYZED --->	12/09/98		12/10/98		12/10/98		12/10/98		12/10/98		12/10/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9812328	VAL	9812405	VAL	9812405	VAL	9812405	VAL	9812405	VAL	9812405	VAL
75-00-3	Chloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-09-2	Methylene chloride	20.	UJ	20.	UJ	20.	UJ	20.	UJ	20.	UJ	20.	UJ
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
594-20-7	2,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-59-2	cis-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-97-5	Chlorobromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
563-58-6	1,1-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
56-23-5	Carbon tetrachloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-43-2	Benzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-01-6	Trichloroethene	1.35		1.	U	1.	U	1.	U	1.	U	1.	U
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-95-3	Dibromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-88-3	Toluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
142-28-9	1,3-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
127-18-4	Tetrachloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-93-4	1,2-Dibromoethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-90-7	Chlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-41-4	Ethylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
630-20-6	1,1,1,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
9999900-05-0	m+p Xylene	1.	U	NR		NR		NR		NR		NR	
95-47-6	o-Xylene	1.	U	NR		NR		NR		NR		NR	
100-42-5	Styrene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-82-8	Benzene, 1-methylethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-25-2	Bromoform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0041-60		039-G-0042-40		039-G-0042-50		039-G-0042-60		039-G-0043-50		039-G-0043-60	
	ORIGINAL ID ----->	039G004160		039G004240		039G004250		039G004260		039G004350		039G004260	
	LAB SAMPLE ID --->	9812328-03		9812405-02		9812405-01		9812405-03		9812405-04		9812405-05	
	ID FROM REPORT -->	039G004160		039G004240		039G004250		039G004260		039G004350		039G004260	
	SAMPLE DATE ----->	12/07/98		12/09/98		12/09/98		12/09/98		12/09/98		12/09/98	
	DATE EXTRACTED -->			12/10/98		12/10/98		12/10/98		12/10/98		12/10/98	
	DATE ANALYZED --->	12/09/98		12/10/98		12/10/98		12/10/98		12/10/98		12/10/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9812328	VAL	9812405	VAL	9812405	VAL	9812405	VAL	9812405	VAL	9812405	VAL
96-18-4	1,2,3-Trichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
103-65-1	n-Propylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-86-1	Bromobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-67-8	Benzene, 1,3,5-trimethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-49-8	2-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-43-4	4-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-06-6	tert-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-63-6	Benzene, 1,2,4-trimethyl	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
135-98-8	sec-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
99-87-6	p-Isopropyltoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
104-51-8	n-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-12-8	1,2-Dibromo-3-Chloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-68-3	Hexachlorobutadiene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
91-20-3	Naphthalene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-64-1	Acetone	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-02-8	Acrolein	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-13-1	Acrylonitrile	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
78-93-3	2-Butanone (MEK)	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
75-15-0	Carbon disulfide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
110-75-8	2-Chloroethylvinylether	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
74-88-4	Methyl iodide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-05-4	Vinyl acetate	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		NR		NR	
9999900-00-3	Isopropylbenzene	NR		NR		NR		NR		NR		NR	
75-05-8	Acetonitrile	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0041-60		039-G-0042-40		039-G-0042-50		039-G-0042-60		039-G-0043-50		039-G-0043-60	
	ORIGINAL ID ----->	039G004160		039G004240		039G004250		039G004260		039G004350		039G004260	
	LAB SAMPLE ID --->	9812328-03		9812405-02		9812405-01		9812405-03		9812405-04		9812405-05	
	ID FROM REPORT -->	039G004160		039G004240		039G004250		039G004260		039G004350		039G004260	
	SAMPLE DATE ----->	12/07/98		12/09/98		12/09/98		12/09/98		12/09/98		12/09/98	
	DATE EXTRACTED -->			12/10/98		12/10/98		12/10/98		12/10/98		12/10/98	
	DATE ANALYZED --->	12/09/98		12/10/98		12/10/98		12/10/98		12/10/98		12/10/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9812328	VAL	9812405	VAL	9812405	VAL	9812405	VAL	9812405	VAL	9812405	VAL
141-78-6	Ethyl acetate	NR		NR		NR		NR		NR		NR	
1634-04-4	Methyl tert-butyl ether	NR		NR		NR		NR		NR		NR	
1330-20-7	Xylene (Total)	NR		1.	U	1.	U	1.	U	1.	U	1.	U
110-57-6	trans-1,4-Dichloro-2-butene	NR		1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0045-40		039-G-0045-50		039-G-0045-60		039-G-0046-40		039-G-0046-50		039-G-0046-60	
	ORIGINAL ID ----->	039G004540		039G004550		039G004560		039G004640		039G004650		039G004660	
	LAB SAMPLE ID --->	9812507-01		9812507-02		9812507-03		9812507-04		9812507-05		9812507-06	
	ID FROM REPORT -->	039G004540		039G004550		039G004560		039G004640		039G004650		039G004660	
	SAMPLE DATE ----->	12/10/98		12/10/98		12/10/98		12/11/98		12/11/98		12/11/98	
	DATE EXTRACTED -->	12/14/98		12/14/98		12/14/98		12/14/98		12/14/98		12/14/98	
	DATE ANALYZED --->	12/14/98		12/14/98		12/14/98		12/14/98		12/14/98		12/14/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9812507	VAL	9812507	VAL	9812507	VAL	9812507	VAL	9812507	VAL	9812507	VAL
75-00-3	Chloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-09-2	Methylene chloride	20.	UJ	20.	UJ	20.	UJ	20.	UJ	20.	UJ	20.	UJ
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
594-20-7	2,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-59-2	cis-1,2-Dichloroethene	1.	U	1.12		1.	U	1.	U	1.	U	1.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-97-5	Chlorobromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
563-58-6	1,1-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
56-23-5	Carbon tetrachloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.71		1.	U
71-43-2	Benzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-01-6	Trichloroethene	1.	U	160.		1.	U	1.	U	1.	U	1.	U
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-95-3	Dibromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-88-3	Toluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
142-28-9	1,3-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
127-18-4	Tetrachloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-93-4	1,2-Dibromoethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-90-7	Chlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-41-4	Ethylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
630-20-6	1,1,1,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
9999900-05-0	m+p Xylene	NR		NR		NR		NR		NR		NR	
95-47-6	o-Xylene	NR		NR		NR		NR		NR		NR	
100-42-5	Styrene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-82-8	Benzene, 1-methylethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-25-2	Bromoform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0045-40		039-G-0045-50		039-G-0045-60		039-G-0046-40		039-G-0046-50		039-G-0046-60	
	ORIGINAL ID ----->	039G004540		039G004550		039G004560		039G004640		039G004650		039G004660	
	LAB SAMPLE ID --->	9812507-01		9812507-02		9812507-03		9812507-04		9812507-05		9812507-06	
	ID FROM REPORT -->	039G004540		039G004550		039G004560		039G004640		039G004650		039G004660	
	SAMPLE DATE ----->	12/10/98		12/10/98		12/10/98		12/11/98		12/11/98		12/11/98	
	DATE EXTRACTED -->	12/14/98		12/14/98		12/14/98		12/14/98		12/14/98		12/14/98	
	DATE ANALYZED --->	12/14/98		12/14/98		12/14/98		12/14/98		12/14/98		12/14/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9812507	VAL	9812507	VAL	9812507	VAL	9812507	VAL	9812507	VAL	9812507	VAL
96-18-4	1,2,3-Trichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
103-65-1	n-Propylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-86-1	Bromobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-67-8	Benzene, 1,3,5-trimethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-49-8	2-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-43-4	4-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-06-6	tert-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-63-6	Benzene, 1,2,4-trimethyl	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
135-98-8	sec-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
99-87-6	p-Isopropyltoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
104-51-8	n-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-12-8	1,2-Dibromo-3-Chloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-68-3	Hexachlorobutadiene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
91-20-3	Naphthalene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-64-1	Acetone	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-02-8	Acrolein	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-13-1	Acrylonitrile	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
78-93-3	2-Butanone (MEK)	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
75-15-0	Carbon disulfide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
110-75-8	2-Chloroethylvinylether	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
74-88-4	Methyl iodide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-05-4	Vinyl acetate	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		NR		NR	
9999900-00-3	Isopropylbenzene	NR		NR		NR		NR		NR		NR	
75-05-8	Acetonitrile	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0045-40		039-G-0045-50		039-G-0045-60		039-G-0046-40		039-G-0046-50		039-G-0046-60	
	ORIGINAL ID ----->	039G004540		039G004550		039G004560		039G004640		039G004650		039G004660	
	LAB SAMPLE ID --->	9812507-01		9812507-02		9812507-03		9812507-04		9812507-05		9812507-06	
	ID FROM REPORT -->	039G004540		039G004550		039G004560		039G004640		039G004650		039G004660	
	SAMPLE DATE ----->	12/10/98		12/10/98		12/10/98		12/11/98		12/11/98		12/11/98	
	DATE EXTRACTED -->	12/14/98		12/14/98		12/14/98		12/14/98		12/14/98		12/14/98	
	DATE ANALYZED --->	12/14/98		12/14/98		12/14/98		12/14/98		12/14/98		12/14/98	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9812507	VAL	9812507	VAL	9812507	VAL	9812507	VAL	9812507	VAL	9812507	VAL
141-78-6	Ethyl acetate	NR		NR		NR		NR		NR		NR	
1634-04-4	Methyl tert-butyl ether	NR		NR		NR		NR		NR		NR	
1330-20-7	Xylene (Total)	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
110-57-6	trans-1,4-Dichloro-2-butene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0047-40		039-G-0047-50		039-G-0047-60		039-G-0048-40		039-G-0048-50		039-G-0048-60	
	ORIGINAL ID ----->	039G004740		039G004750		039G004760		039G004840		039G004850		039G004860	
	LAB SAMPLE ID --->	9901308-01		9901308-02		9901308-03		9901323-03		9901323-05		9901323-02	
	ID FROM REPORT -->	039G004740		039G004750		039G004760		039G004840		039G004850		039G004860	
	SAMPLE DATE ----->	01/12/99		01/12/99		01/12/99		01/13/99		01/13/99		01/13/99	
	DATE ANALYZED --->	01/14/99		01/14/99		01/14/99		01/14/99		01/14/99		01/14/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901308	VAL	9901308	VAL	9901308	VAL	9901323	VAL	9901323	VAL	9901323	VAL
75-00-3	Chloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-09-2	Methylene chloride	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
594-20-7	2,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-59-2	cis-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-97-5	Chlorobromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
563-58-6	1,1-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
56-23-5	Carbon tetrachloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.52		1.	U
71-43-2	Benzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-01-6	Trichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-95-3	Dibromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-88-3	Toluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
142-28-9	1,3-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-93-4	1,2-Dibromoethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-90-7	Chlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-41-4	Ethylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
630-20-6	1,1,1,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
9999900-05-0	m+p Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-47-6	o-Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-42-5	Styrene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-82-8	Benzene, 1-methylethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-25-2	Bromoform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0047-40		039-G-0047-50		039-G-0047-60		039-G-0048-40		039-G-0048-50		039-G-0048-60	
	ORIGINAL ID ----->	039G004740		039G004750		039G004760		039G004840		039G004850		039G004860	
	LAB SAMPLE ID --->	9901308-01		9901308-02		9901308-03		9901323-03		9901323-05		9901323-02	
	ID FROM REPORT -->	039G004740		039G004750		039G004760		039G004840		039G004850		039G004860	
	SAMPLE DATE ----->	01/12/99		01/12/99		01/12/99		01/13/99		01/13/99		01/13/99	
	DATE ANALYZED --->	01/14/99		01/14/99		01/14/99		01/14/99		01/14/99		01/14/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901308	VAL	9901308	VAL	9901308	VAL	9901323	VAL	9901323	VAL	9901323	VAL
103-65-1	n-Propylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-86-1	Bromobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-67-8	Benzene, 1,3,5-trimethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-49-8	2-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-43-4	4-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-06-6	tert-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-63-6	Benzene, 1,2,4-trimethyl	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
135-98-8	sec-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
99-87-6	p-Isopropyltoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
104-51-8	n-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-12-8	1,2-Dibromo-3-Chloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-68-3	Hexachlorobutadiene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
91-20-3	Naphthalene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-64-1	Acetone	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-02-8	Acrolein	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-13-1	Acrylonitrile	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
78-93-3	2-Butanone (MEK)	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
75-15-0	Carbon disulfide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
110-75-8	2-Chloroethylvinylether	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
74-88-4	Methyl iodide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-05-4	Vinyl acetate	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		NR		NR	
9999900-00-3	Isopropylbenzene	NR		NR		NR		NR		NR		NR	
75-05-8	Acetonitrile	50.	U	50.	U	50.	U	50.	U	50.	U	50.	U
141-78-6	Ethyl acetate	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
1634-04-4	Methyl tert-butyl ether	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0047-40		039-G-0047-50		039-G-0047-60		039-G-0048-40		039-G-0048-50		039-G-0048-60	
	ORIGINAL ID ----->	039G004740		039G004750		039G004760		039G004840		039G004850		039G004860	
	LAB SAMPLE ID --->	9901308-01		9901308-02		9901308-03		9901323-03		9901323-05		9901323-02	
	ID FROM REPORT -->	039G004740		039G004750		039G004760		039G004840		039G004850		039G004860	
	SAMPLE DATE ----->	01/12/99		01/12/99		01/12/99		01/13/99		01/13/99		01/13/99	
	DATE ANALYZED --->	01/14/99		01/14/99		01/14/99		01/14/99		01/14/99		01/14/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901308	VAL	9901308	VAL	9901308	VAL	9901323	VAL	9901323	VAL	9901323	VAL
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0049-40		039-G-0049-50		039-G-0049-60		039-G-0050-40		039-G-0050-50		039-G-0050-60	
	ORIGINAL ID ----->	039G004940		039G004950		039G004960		039G005040		039G005050		039G005060	
	LAB SAMPLE ID --->	9901323-01		9901323-06		9901323-04		9901350-01		9901350-03		9901350-02	
	ID FROM REPORT -->	039G004940		039G004950		039G004960		039G005040		039G005050		039G005060	
	SAMPLE DATE ----->	01/13/99		01/13/99		01/13/99		01/14/99		01/14/99		01/14/99	
	DATE ANALYZED --->	01/14/99		01/14/99		01/14/99		01/14/99		01/14/99		01/14/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901323	VAL	9901323	VAL	9901323	VAL	9901350	VAL	9901350	VAL	9901350	VAL
75-00-3	Chloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-09-2	Methylene chloride	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
594-20-7	2,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-59-2	cis-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-97-5	Chlorobromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
563-58-6	1,1-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
56-23-5	Carbon tetrachloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	4.46		1.	U	1.	U	1.	U	1.	U	1.	U
71-43-2	Benzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-01-6	Trichloroethene	1.	U	1.	U	1.	U	8.21		1.	U	1.	U
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-95-3	Dibromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-88-3	Toluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
142-28-9	1,3-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-93-4	1,2-Dibromoethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-90-7	Chlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-41-4	Ethylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
630-20-6	1,1,1,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
9999900-05-0	m+p Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-47-6	o-Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-42-5	Styrene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-82-8	Benzene, 1-methylethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-25-2	Bromoform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0049-40		039-G-0049-50		039-G-0049-60		039-G-0050-40		039-G-0050-50		039-G-0050-60	
	ORIGINAL ID ----->	039G004940		039G004950		039G004960		039G005040		039G005050		039G005060	
	LAB SAMPLE ID --->	9901323-01		9901323-06		9901323-04		9901350-01		9901350-03		9901350-02	
	ID FROM REPORT -->	039G004940		039G004950		039G004960		039G005040		039G005050		039G005060	
	SAMPLE DATE ----->	01/13/99		01/13/99		01/13/99		01/14/99		01/14/99		01/14/99	
	DATE ANALYZED --->	01/14/99		01/14/99		01/14/99		01/14/99		01/14/99		01/14/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901323	VAL	9901323	VAL	9901323	VAL	9901350	VAL	9901350	VAL	9901350	VAL
103-65-1	n-Propylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-86-1	Bromobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-67-8	Benzene, 1,3,5-trimethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-49-8	2-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-43-4	4-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-06-6	tert-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-63-6	Benzene, 1,2,4-trimethyl	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
135-98-8	sec-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
99-87-6	p-Isopropyltoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
104-51-8	n-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-12-8	1,2-Dibromo-3-Chloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-68-3	Hexachlorobutadiene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
91-20-3	Naphthalene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-64-1	Acetone	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-02-8	Acrolein	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-13-1	Acrylonitrile	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
78-93-3	2-Butanone (MEK)	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
75-15-0	Carbon disulfide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
110-75-8	2-Chloroethylvinylether	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
74-88-4	Methyl iodide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-05-4	Vinyl acetate	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		NR		NR	
9999900-00-3	Isopropylbenzene	NR		NR		NR		NR		NR		NR	
75-05-8	Acetonitrile	50.	U	50.	U	50.	U	50.	U	50.	U	50.	U
141-78-6	Ethyl acetate	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
1634-04-4	Methyl tert-butyl ether	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0049-40		039-G-0049-50		039-G-0049-60		039-G-0050-40		039-G-0050-50		039-G-0050-60	
	ORIGINAL ID ----->	039G004940		039G004950		039G004960		039G005040		039G005050		039G005060	
	LAB SAMPLE ID --->	9901323-01		9901323-06		9901323-04		9901350-01		9901350-03		9901350-02	
	ID FROM REPORT -->	039G004940		039G004950		039G004960		039G005040		039G005050		039G005060	
	SAMPLE DATE ----->	01/13/99		01/13/99		01/13/99		01/14/99		01/14/99		01/14/99	
	DATE ANALYZED --->	01/14/99		01/14/99		01/14/99		01/14/99		01/14/99		01/14/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901323	VAL	9901323	VAL	9901323	VAL	9901350	VAL	9901350	VAL	9901350	VAL
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0051-40		039-G-0051-50		039-H-0051-50		039-G-0051-60		039-G-0052-40		039-G-0052-50	
	ORIGINAL ID ----->	039G005140		039G005150		039H005150		039G005160		039G005240		039G005250	
	LAB SAMPLE ID --->	9901350-04		9901398-01		9901398-02		9901398-03		9901398-04		9901398-05	
	ID FROM REPORT -->	039G005140		039G005150		039H005150		039G005160		039G005240		039G005250	
	SAMPLE DATE ----->	01/14/99		01/14/99		01/14/99		01/14/99		01/15/99		01/15/99	
	DATE ANALYZED --->	01/15/99		01/17/99		01/17/99		01/17/99		01/17/99		01/17/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901350	VAL	9901398	VAL	9901398	VAL	9901398	VAL	9901398	VAL	9901398	VAL
75-00-3	Chloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-09-2	Methylene chloride	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
594-20-7	2,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-59-2	cis-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-97-5	Chlorobromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
563-58-6	1,1-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
56-23-5	Carbon tetrachloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-43-2	Benzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-01-6	Trichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-95-3	Dibromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-88-3	Toluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
142-28-9	1,3-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-93-4	1,2-Dibromoethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-90-7	Chlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-41-4	Ethylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
630-20-6	1,1,1,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
9999900-05-0	m+p Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-47-6	o-Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-42-5	Styrene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-82-8	Benzene, 1-methylethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-25-2	Bromoform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0051-40		039-G-0051-50		039-H-0051-50		039-G-0051-60		039-G-0052-40		039-G-0052-50	
	ORIGINAL ID ----->	039G005140		039G005150		039H005150		039G005160		039G005240		039G005250	
	LAB SAMPLE ID --->	9901350-04		9901398-01		9901398-02		9901398-03		9901398-04		9901398-05	
	ID FROM REPORT -->	039G005140		039G005150		039H005150		039G005160		039G005240		039G005250	
	SAMPLE DATE ----->	01/14/99		01/14/99		01/14/99		01/14/99		01/15/99		01/15/99	
	DATE ANALYZED --->	01/15/99		01/17/99		01/17/99		01/17/99		01/17/99		01/17/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901350	VAL	9901398	VAL	9901398	VAL	9901398	VAL	9901398	VAL	9901398	VAL
103-65-1	n-Propylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-86-1	Bromobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-67-8	Benzene, 1,3,5-trimethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-49-8	2-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-43-4	4-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-06-6	tert-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-63-6	Benzene, 1,2,4-trimethyl	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
135-98-8	sec-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
99-87-6	p-Isopropyltoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
104-51-8	n-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-12-8	1,2-Dibromo-3-Chloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-68-3	Hexachlorobutadiene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
91-20-3	Naphthalene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-64-1	Acetone	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-02-8	Acrolein	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-13-1	Acrylonitrile	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
78-93-3	2-Butanone (MEK)	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
75-15-0	Carbon disulfide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
110-75-8	2-Chloroethylvinylether	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
74-88-4	Methyl iodide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-05-4	Vinyl acetate	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		NR		NR	
9999900-00-3	Isopropylbenzene	NR		NR		NR		NR		NR		NR	
75-05-8	Acetonitrile	50.	U	50.	U	50.	U	50.	U	50.	U	50.	U
141-78-6	Ethyl acetate	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
1634-04-4	Methyl tert-butyl ether	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0051-40		039-G-0051-50		039-H-0051-50		039-G-0051-60		039-G-0052-40		039-G-0052-50	
	ORIGINAL ID ----->	039G005140		039G005150		039H005150		039G005160		039G005240		039G005250	
	LAB SAMPLE ID --->	9901350-04		9901398-01		9901398-02		9901398-03		9901398-04		9901398-05	
	ID FROM REPORT -->	039G005140		039G005150		039H005150		039G005160		039G005240		039G005250	
	SAMPLE DATE ----->	01/14/99		01/14/99		01/14/99		01/14/99		01/15/99		01/15/99	
	DATE ANALYZED --->	01/15/99		01/17/99		01/17/99		01/17/99		01/17/99		01/17/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901350	VAL	9901398	VAL	9901398	VAL	9901398	VAL	9901398	VAL	9901398	VAL
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0052-60		039-G-0058-40		039-G-0058-50		039-G-0058-60		039-G-0059-40		039-G-0059-50	
	ORIGINAL ID ----->	039G005260		039G005840		039G005850		039G005860		039G005940		039G005950	
	LAB SAMPLE ID --->	9901398-06		9901423-01		9901423-02		9901423-03		9901448-01		9901448-02	
	ID FROM REPORT -->	039G005260		039G005840		039G005850		039G005860		039G005940		039G005950	
	SAMPLE DATE ----->	01/15/99		01/18/99		01/18/99		01/18/99		01/18/99		01/18/99	
	DATE ANALYZED --->	01/17/99		01/18/99		01/18/99		01/18/99		01/20/99		01/20/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901398	VAL	9901423	VAL	9901423	VAL	9901423	VAL	9901448	VAL	9901448	VAL
75-00-3	Chloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-09-2	Methylene chloride	10.	U	10.	U	10.	U	10.	U	10.	UJ	10.	UJ
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
594-20-7	2,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-59-2	cis-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-97-5	Chlorobromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
563-58-6	1,1-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
56-23-5	Carbon tetrachloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-43-2	Benzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-01-6	Trichloroethene	1.	U	1.	U	1.	U	1.	U	2.01		1.	U
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-95-3	Dibromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-88-3	Toluene	1.	U	5.	U	5.	U	5.	U	5.	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
142-28-9	1,3-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-93-4	1,2-Dibromoethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-90-7	Chlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-41-4	Ethylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
630-20-6	1,1,1,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
9999900-05-0	m+p Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-47-6	o-Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-42-5	Styrene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-82-8	Benzene, 1-methylethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-25-2	Bromoform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0052-60		039-G-0058-40		039-G-0058-50		039-G-0058-60		039-G-0059-40		039-G-0059-50	
	ORIGINAL ID ----->	039G005260		039G005840		039G005850		039G005860		039G005940		039G005950	
	LAB SAMPLE ID --->	9901398-06		9901423-01		9901423-02		9901423-03		9901448-01		9901448-02	
	ID FROM REPORT -->	039G005260		039G005840		039G005850		039G005860		039G005940		039G005950	
	SAMPLE DATE ----->	01/15/99		01/18/99		01/18/99		01/18/99		01/18/99		01/18/99	
	DATE ANALYZED --->	01/17/99		01/18/99		01/18/99		01/18/99		01/20/99		01/20/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901398	VAL	9901423	VAL	9901423	VAL	9901423	VAL	9901448	VAL	9901448	VAL
103-65-1	n-Propylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-86-1	Bromobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-67-8	Benzene, 1,3,5-trimethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-49-8	2-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-43-4	4-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-06-6	tert-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-63-6	Benzene, 1,2,4-trimethyl	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
135-98-8	sec-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
99-87-6	p-Isopropyltoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
104-51-8	n-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-12-8	1,2-Dibromo-3-Chloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-68-3	Hexachlorobutadiene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
91-20-3	Naphthalene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	1.	U	1.	UJ	1.	UJ	1.	UJ	1.	U	1.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-64-1	Acetone	20.	U	89.9		71.2		20.	U	20.	U	20.	U
107-02-8	Acrolein	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-13-1	Acrylonitrile	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
78-93-3	2-Butanone (MEK)	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
75-15-0	Carbon disulfide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
110-75-8	2-Chloroethylvinylether	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
74-88-4	Methyl iodide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-05-4	Vinyl acetate	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		NR		NR	
9999900-00-3	Isopropylbenzene	NR		NR		NR		NR		NR		NR	
75-05-8	Acetonitrile	50.	U	50.	U	50.	U	50.	U	50.	U	50.	U
141-78-6	Ethyl acetate	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
1634-04-4	Methyl tert-butyl ether	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0052-60		039-G-0058-40		039-G-0058-50		039-G-0058-60		039-G-0059-40		039-G-0059-50	
	ORIGINAL ID ----->	039G005260		039G005840		039G005850		039G005860		039G005940		039G005950	
	LAB SAMPLE ID --->	9901398-06		9901423-01		9901423-02		9901423-03		9901448-01		9901448-02	
	ID FROM REPORT -->	039G005260		039G005840		039G005850		039G005860		039G005940		039G005950	
	SAMPLE DATE ----->	01/15/99		01/18/99		01/18/99		01/18/99		01/18/99		01/18/99	
	DATE ANALYZED --->	01/17/99		01/18/99		01/18/99		01/18/99		01/20/99		01/20/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901398	VAL	9901423	VAL	9901423	VAL	9901423	VAL	9901448	VAL	9901448	VAL
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0059-60		039-G-0060-40		039-G-0060-50		039-G-0060-60		039-G-0061-40		039-G-0061-50	
	ORIGINAL ID ----->	039G005960		039G006040		039G006050		039G006060		039G006140		039G006150	
	LAB SAMPLE ID --->	9901448-03		9901448-04		9901448-05		9901448-06		9901478-01		9901478-02	
	ID FROM REPORT -->	039G005960		039G006040		039G006050		039G006060		039G006140		039G006150	
	SAMPLE DATE ----->	01/18/99		01/19/99		01/19/99		01/19/99		01/19/99		01/19/99	
	DATE ANALYZED --->	01/20/99		01/20/99		01/20/99		01/20/99		01/21/99		01/21/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901448	VAL	9901448	VAL	9901448	VAL	9901448	VAL	9901478	VAL	9901478	VAL
75-00-3	Chloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-09-2	Methylene chloride	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
594-20-7	2,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-59-2	cis-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-97-5	Chlorobromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
563-58-6	1,1-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
56-23-5	Carbon tetrachloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-43-2	Benzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-01-6	Trichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-95-3	Dibromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-88-3	Toluene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
142-28-9	1,3-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-93-4	1,2-Dibromoethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-90-7	Chlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-41-4	Ethylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
630-20-6	1,1,1,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
9999900-05-0	m+p Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-47-6	o-Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-42-5	Styrene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-82-8	Benzene, 1-methylethyl-	1.	U	1.	U	1.	U	1.	U	NR		NR	
75-25-2	Bromoform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0059-60		039-G-0060-40		039-G-0060-50		039-G-0060-60		039-G-0061-40		039-G-0061-50	
	ORIGINAL ID ----->	039G005960		039G006040		039G006050		039G006060		039G006140		039G006150	
	LAB SAMPLE ID --->	9901448-03		9901448-04		9901448-05		9901448-06		9901478-01		9901478-02	
	ID FROM REPORT -->	039G005960		039G006040		039G006050		039G006060		039G006140		039G006150	
	SAMPLE DATE ----->	01/18/99		01/19/99		01/19/99		01/19/99		01/19/99		01/19/99	
	DATE ANALYZED --->	01/20/99		01/20/99		01/20/99		01/20/99		01/21/99		01/21/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901448	VAL	9901448	VAL	9901448	VAL	9901448	VAL	9901478	VAL	9901478	VAL
103-65-1	n-Propylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-86-1	Bromobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-67-8	Benzene, 1,3,5-trimethyl-	1.	U	1.	U	1.	U	1.	U	NR		NR	
95-49-8	2-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-43-4	4-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-06-6	tert-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-63-6	Benzene, 1,2,4-trimethyl	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
135-98-8	sec-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
99-87-6	p-Isopropyltoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
104-51-8	n-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-12-8	1,2-Dibromo-3-Chloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-68-3	Hexachlorobutadiene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
91-20-3	Naphthalene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-64-1	Acetone	20.	U	33.2		20.	U	20.	U	25.4		20.	U
107-02-8	Acrolein	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-13-1	Acrylonitrile	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
78-93-3	2-Butanone (MEK)	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
75-15-0	Carbon disulfide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
110-75-8	2-Chloroethylvinylether	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
74-88-4	Methyl iodide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-05-4	Vinyl acetate	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		1.	U	1.	U
9999900-00-3	Isopropylbenzene	NR		NR		NR		NR		1.	U	1.	U
75-05-8	Acetonitrile	50.	U	50.	U	50.	U	50.	U	50.	U	50.	U
141-78-6	Ethyl acetate	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
1634-04-4	Methyl tert-butyl ether	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0059-60		039-G-0060-40		039-G-0060-50		039-G-0060-60		039-G-0061-40		039-G-0061-50	
	ORIGINAL ID ----->	039G005960		039G006040		039G006050		039G006060		039G006140		039G006150	
	LAB SAMPLE ID --->	9901448-03		9901448-04		9901448-05		9901448-06		9901478-01		9901478-02	
	ID FROM REPORT -->	039G005960		039G006040		039G006050		039G006060		039G006140		039G006150	
	SAMPLE DATE ----->	01/18/99		01/19/99		01/19/99		01/19/99		01/19/99		01/19/99	
	DATE ANALYZED --->	01/20/99		01/20/99		01/20/99		01/20/99		01/21/99		01/21/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901448	VAL	9901448	VAL	9901448	VAL	9901448	VAL	9901478	VAL	9901478	VAL
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0061-60		039-G-0062-40		039-G-0062-50		039-G-0062-60		039-G-0063-40		039-G-0063-50	
	ORIGINAL ID ----->	039G006160		039G006240		039G006250		039G006260		039G006340		039G006350	
	LAB SAMPLE ID --->	9901478-03		9901478-04		9901478-05		9901478-06		9901630-01		9901630-02	
	ID FROM REPORT -->	039G006160		039G006240		039G006250		039G006260		039G006340		039G006350	
	SAMPLE DATE ----->	01/19/99		01/19/99		01/19/99		01/19/99		01/20/99		01/20/99	
	DATE ANALYZED --->	01/21/99		01/21/99		01/21/99		01/21/99		01/25/99		01/25/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901478	VAL	9901478	VAL	9901478	VAL	9901478	VAL	9901630	VAL	9901630	VAL
75-00-3	Chloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-09-2	Methylene chloride	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ	10.	UJ
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
594-20-7	2,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-59-2	cis-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-97-5	Chlorobromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
563-58-6	1,1-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
56-23-5	Carbon tetrachloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-43-2	Benzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-01-6	Trichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-95-3	Dibromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-88-3	Toluene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
142-28-9	1,3-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-93-4	1,2-Dibromoethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-90-7	Chlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-41-4	Ethylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
630-20-6	1,1,1,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
9999900-05-0	m+p Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-47-6	o-Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-42-5	Styrene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-82-8	Benzene, 1-methylethyl-	NR		NR		NR		NR		1.	U	1.	U
75-25-2	Bromoform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0061-60		039-G-0062-40		039-G-0062-50		039-G-0062-60		039-G-0063-40		039-G-0063-50	
	ORIGINAL ID ----->	039G006160		039G006240		039G006250		039G006260		039G006340		039G006350	
	LAB SAMPLE ID --->	9901478-03		9901478-04		9901478-05		9901478-06		9901630-01		9901630-02	
	ID FROM REPORT -->	039G006160		039G006240		039G006250		039G006260		039G006340		039G006350	
	SAMPLE DATE ----->	01/19/99		01/19/99		01/19/99		01/19/99		01/20/99		01/20/99	
	DATE ANALYZED --->	01/21/99		01/21/99		01/21/99		01/21/99		01/25/99		01/25/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901478	VAL	9901478	VAL	9901478	VAL	9901478	VAL	9901630	VAL	9901630	VAL
103-65-1	n-Propylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-86-1	Bromobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-67-8	Benzene, 1,3,5-trimethyl-	NR		NR		NR		NR		1.	U	1.	U
95-49-8	2-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-43-4	4-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-06-6	tert-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-63-6	Benzene, 1,2,4-trimethyl	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
135-98-8	sec-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
99-87-6	p-Isopropyltoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
104-51-8	n-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-12-8	1,2-Dibromo-3-Chloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-68-3	Hexachlorobutadiene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
91-20-3	Naphthalene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-64-1	Acetone	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-02-8	Acrolein	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-13-1	Acrylonitrile	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
78-93-3	2-Butanone (MEK)	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
75-15-0	Carbon disulfide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
110-75-8	2-Chloroethylvinylether	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
74-88-4	Methyl iodide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-05-4	Vinyl acetate	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
9999900-00-8	1,3,5-Trimethylbenzene	1.	U	1.	U	1.	U	1.	U	NR		NR	
9999900-00-3	Isopropylbenzene	1.	U	1.	U	1.	U	1.	U	NR		NR	
75-05-8	Acetonitrile	50.	U	50.	U	50.	U	50.	U	50.	U	50.	U
141-78-6	Ethyl acetate	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
1634-04-4	Methyl tert-butyl ether	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0061-60		039-G-0062-40		039-G-0062-50		039-G-0062-60		039-G-0063-40		039-G-0063-50	
	ORIGINAL ID ----->	039G006160		039G006240		039G006250		039G006260		039G006340		039G006350	
	LAB SAMPLE ID --->	9901478-03		9901478-04		9901478-05		9901478-06		9901630-01		9901630-02	
	ID FROM REPORT -->	039G006160		039G006240		039G006250		039G006260		039G006340		039G006350	
	SAMPLE DATE ----->	01/19/99		01/19/99		01/19/99		01/19/99		01/20/99		01/20/99	
	DATE ANALYZED --->	01/21/99		01/21/99		01/21/99		01/21/99		01/25/99		01/25/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901478	VAL	9901478	VAL	9901478	VAL	9901478	VAL	9901630	VAL	9901630	VAL
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0063-60		039-G-0064-40		039-G-0064-50		039-H-0064-50		039-G-0064-60		039-G-0065-40	
	ORIGINAL ID ----->	039G006360		039G006440		039G006450		039H006450		039G006460		039G006540	
	LAB SAMPLE ID --->	9901630-03		9901678-01		9901678-02		9901678-03		9901678-04		9901678-05	
	ID FROM REPORT -->	039G006360		039G006440		039G006450		039H006450		039G006460		039G006540	
	SAMPLE DATE ----->	01/20/99		01/26/99		01/26/99		01/26/99		01/26/99		01/26/99	
	DATE ANALYZED --->	01/25/99		01/27/99		01/27/99		01/27/99		01/27/99		01/27/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901630	VAL	9901678	VAL	9901678	VAL	9901678	VAL	9901678	VAL	9901678	VAL
75-00-3	Chloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-09-2	Methylene chloride	10.	UJ	10.	U	10.	U	10.	U	10.	U	10.	U
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
594-20-7	2,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-59-2	cis-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-97-5	Chlorobromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
563-58-6	1,1-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
56-23-5	Carbon tetrachloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-43-2	Benzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-01-6	Trichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-95-3	Dibromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-88-3	Toluene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
142-28-9	1,3-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-93-4	1,2-Dibromoethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-90-7	Chlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-41-4	Ethylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
630-20-6	1,1,1,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
9999900-05-0	m+p Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-47-6	o-Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-42-5	Styrene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-82-8	Benzene, 1-methylethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-25-2	Bromoform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0063-60		039-G-0064-40		039-G-0064-50		039-H-0064-50		039-G-0064-60		039-G-0065-40	
	ORIGINAL ID ----->	039G006360		039G006440		039G006450		039H006450		039G006460		039G006540	
	LAB SAMPLE ID --->	9901630-03		9901678-01		9901678-02		9901678-03		9901678-04		9901678-05	
	ID FROM REPORT -->	039G006360		039G006440		039G006450		039H006450		039G006460		039G006540	
	SAMPLE DATE ----->	01/20/99		01/26/99		01/26/99		01/26/99		01/26/99		01/26/99	
	DATE ANALYZED --->	01/25/99		01/27/99		01/27/99		01/27/99		01/27/99		01/27/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901630	VAL	9901678	VAL	9901678	VAL	9901678	VAL	9901678	VAL	9901678	VAL
103-65-1	n-Propylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-86-1	Bromobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-67-8	Benzene, 1,3,5-trimethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-49-8	2-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-43-4	4-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-06-6	tert-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-63-6	Benzene, 1,2,4-trimethyl	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
135-98-8	sec-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
99-87-6	p-Isopropyltoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
104-51-8	n-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-12-8	1,2-Dibromo-3-Chloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-68-3	Hexachlorobutadiene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
91-20-3	Naphthalene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-64-1	Acetone	20.	U	30.2		35.9		38.5		20.	U	20.	U
107-02-8	Acrolein	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-13-1	Acrylonitrile	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
78-93-3	2-Butanone (MEK)	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
75-15-0	Carbon disulfide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
110-75-8	2-Chloroethylvinylether	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
74-88-4	Methyl iodide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-05-4	Vinyl acetate	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		NR		NR	
9999900-00-3	Isopropylbenzene	NR		NR		NR		NR		NR		NR	
75-05-8	Acetonitrile	50.	U	50.	U	50.	U	50.	U	50.	U	50.	U
141-78-6	Ethyl acetate	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
1634-04-4	Methyl tert-butyl ether	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0063-60		039-G-0064-40		039-G-0064-50		039-H-0064-50		039-G-0064-60		039-G-0065-40	
	ORIGINAL ID ----->	039G006360		039G006440		039G006450		039H006450		039G006460		039G006540	
	LAB SAMPLE ID --->	9901630-03		9901678-01		9901678-02		9901678-03		9901678-04		9901678-05	
	ID FROM REPORT -->	039G006360		039G006440		039G006450		039H006450		039G006460		039G006540	
	SAMPLE DATE ----->	01/20/99		01/26/99		01/26/99		01/26/99		01/26/99		01/26/99	
	DATE ANALYZED --->	01/25/99		01/27/99		01/27/99		01/27/99		01/27/99		01/27/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901630	VAL	9901678	VAL	9901678	VAL	9901678	VAL	9901678	VAL	9901678	VAL
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0065-50		039-G-0065-60		039-G-0066-40		039-G-0066-50		039-G-0066-60		039-G-0067-40	
	ORIGINAL ID ----->	039G006550		039G006560		039G006640		039G006650		039G006660		039G006740	
	LAB SAMPLE ID --->	9901725-01		9901725-02		9901725-03		9901725-04		9901725-05		9901725-06	
	ID FROM REPORT -->	039G006550		039G006560		039G006640		039G006650		039G006660		039G006740	
	SAMPLE DATE ----->	01/26/99		01/26/99		01/27/99		01/27/99		01/27/99		01/27/99	
	DATE ANALYZED --->	01/28/99		01/28/99		01/28/99		01/28/99		01/28/99		01/28/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901725	VAL	9901725	VAL	9901725	VAL	9901725	VAL	9901725	VAL	9901725	VAL
75-00-3	Chloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-09-2	Methylene chloride	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
594-20-7	2,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-59-2	cis-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-97-5	Chlorobromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
563-58-6	1,1-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
56-23-5	Carbon tetrachloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-43-2	Benzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-01-6	Trichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-95-3	Dibromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-88-3	Toluene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
142-28-9	1,3-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-93-4	1,2-Dibromoethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-90-7	Chlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-41-4	Ethylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
630-20-6	1,1,1,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
9999900-05-0	m+p Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-47-6	o-Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-42-5	Styrene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-82-8	Benzene, 1-methylethyl-	NR		NR		NR		NR		NR		NR	
75-25-2	Bromoform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0065-50		039-G-0065-60		039-G-0066-40		039-G-0066-50		039-G-0066-60		039-G-0067-40	
	ORIGINAL ID ----->	039G006550		039G006560		039G006640		039G006650		039G006660		039G006740	
	LAB SAMPLE ID --->	9901725-01		9901725-02		9901725-03		9901725-04		9901725-05		9901725-06	
	ID FROM REPORT -->	039G006550		039G006560		039G006640		039G006650		039G006660		039G006740	
	SAMPLE DATE ----->	01/26/99		01/26/99		01/27/99		01/27/99		01/27/99		01/27/99	
	DATE ANALYZED --->	01/28/99		01/28/99		01/28/99		01/28/99		01/28/99		01/28/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901725	VAL	9901725	VAL	9901725	VAL	9901725	VAL	9901725	VAL	9901725	VAL
103-65-1	n-Propylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-86-1	Bromobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-67-8	Benzene, 1,3,5-trimethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-49-8	2-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-43-4	4-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-06-6	tert-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-63-6	Benzene, 1,2,4-trimethyl	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
135-98-8	sec-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
99-87-6	p-Isopropyltoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
104-51-8	n-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-12-8	1,2-Dibromo-3-Chloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-68-3	Hexachlorobutadiene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
91-20-3	Naphthalene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-64-1	Acetone	24.4		20.	U	20.	U	20.	U	20.	U	20.	U
107-02-8	Acrolein	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-13-1	Acrylonitrile	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
78-93-3	2-Butanone (MEK)	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
75-15-0	Carbon disulfide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
110-75-8	2-Chloroethylvinylether	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
74-88-4	Methyl iodide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-05-4	Vinyl acetate	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		NR		NR	
9999900-00-3	Isopropylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-05-8	Acetonitrile	50.	U	50.	U	50.	U	50.	U	50.	U	50.	U
141-78-6	Ethyl acetate	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
1634-04-4	Methyl tert-butyl ether	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0065-50		039-G-0065-60		039-G-0066-40		039-G-0066-50		039-G-0066-60		039-G-0067-40	
	ORIGINAL ID ----->	039G006550		039G006560		039G006640		039G006650		039G006660		039G006740	
	LAB SAMPLE ID --->	9901725-01		9901725-02		9901725-03		9901725-04		9901725-05		9901725-06	
	ID FROM REPORT -->	039G006550		039G006560		039G006640		039G006650		039G006660		039G006740	
	SAMPLE DATE ----->	01/26/99		01/26/99		01/27/99		01/27/99		01/27/99		01/27/99	
	DATE ANALYZED --->	01/28/99		01/28/99		01/28/99		01/28/99		01/28/99		01/28/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901725	VAL	9901725	VAL	9901725	VAL	9901725	VAL	9901725	VAL	9901725	VAL
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0067-50		039-G-0067-60		039-G-0068-40		039-G-0068-50		039-G-0068-60		039-G-0068-70	
	ORIGINAL ID ----->	039G006750		039G006760		039G006840		039G006850		039G006860		039G006870	
	LAB SAMPLE ID --->	9901775-01		9901775-02		9901775-03		9901775-04		9901775-06		9901792-01	
	ID FROM REPORT -->	039G006750		039G006760		039G006840		039G006850		039G006860		039G006870	
	SAMPLE DATE ----->	01/27/99		01/27/99		01/28/99		01/28/99		01/28/99		01/28/99	
	DATE ANALYZED --->	01/29/99		01/29/99		01/29/99		01/29/99		01/29/99		02/01/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901775	VAL	9901775	VAL	9901775	VAL	9901775	VAL	9901775	VAL	9901792	VAL
75-00-3	Chloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-69-4	Trichlorofluoromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-35-4	1,1-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-09-2	Methylene chloride	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-34-3	1,1-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
594-20-7	2,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
156-59-2	cis-1,2-Dichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-66-3	Chloroform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-97-5	Chlorobromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
563-58-6	1,1-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
56-23-5	Carbon tetrachloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
107-06-2	1,2-Dichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
71-43-2	Benzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-01-6	Trichloroethene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
78-87-5	1,2-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-27-4	Bromodichloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-95-3	Dibromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-88-3	Toluene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
142-28-9	1,3-Dichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
124-48-1	Dibromochloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-93-4	1,2-Dibromoethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-90-7	Chlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-41-4	Ethylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
630-20-6	1,1,1,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
9999900-05-0	m+p Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-47-6	o-Xylene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
100-42-5	Styrene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-82-8	Benzene, 1-methylethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-25-2	Bromoform	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-18-4	1,2,3-Trichloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0067-50		039-G-0067-60		039-G-0068-40		039-G-0068-50		039-G-0068-60		039-G-0068-70	
	ORIGINAL ID ----->	039G006750		039G006760		039G006840		039G006850		039G006860		039G006870	
	LAB SAMPLE ID --->	9901775-01		9901775-02		9901775-03		9901775-04		9901775-06		9901792-01	
	ID FROM REPORT -->	039G006750		039G006760		039G006840		039G006850		039G006860		039G006870	
	SAMPLE DATE ----->	01/27/99		01/27/99		01/28/99		01/28/99		01/28/99		01/28/99	
	DATE ANALYZED --->	01/29/99		01/29/99		01/29/99		01/29/99		01/29/99		02/01/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901775	VAL	9901775	VAL	9901775	VAL	9901775	VAL	9901775	VAL	9901792	VAL
103-65-1	n-Propylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-86-1	Bromobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-67-8	Benzene, 1,3,5-trimethyl-	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-49-8	2-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-43-4	4-Chlorotoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
98-06-6	tert-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-63-6	Benzene, 1,2,4-trimethyl	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
135-98-8	sec-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
99-87-6	p-Isopropyltoluene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
104-51-8	n-Butylbenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
96-12-8	1,2-Dibromo-3-Chloropropane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
120-82-1	1,2,4-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-68-3	Hexachlorobutadiene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
91-20-3	Naphthalene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
87-61-6	1,2,3-Trichlorobenzene	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-71-8	Dichlorodifluoromethane	1.	UJ	1.	UJ	1.	UJ	1.	UJ	1.	UJ	1.	U
74-87-3	Chloromethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
75-01-4	Vinyl chloride	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
74-83-9	Bromomethane	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
67-64-1	Acetone	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-02-8	Acrolein	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
107-13-1	Acrylonitrile	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
78-93-3	2-Butanone (MEK)	20.	U	20.	U	20.	U	20.	U	20.	U	20.	U
75-15-0	Carbon disulfide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
110-75-8	2-Chloroethylvinylether	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
74-88-4	Methyl iodide	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-05-4	Vinyl acetate	10.	U	10.	U	10.	U	10.	U	10.	U	10.	U
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR		NR		NR		NR		NR	
9999900-00-3	Isopropylbenzene	NR		NR		NR		NR		NR		NR	
75-05-8	Acetonitrile	50.	U	50.	U	50.	U	50.	U	50.	U	50.	U
141-78-6	Ethyl acetate	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
1634-04-4	Methyl tert-butyl ether	1.	U	1.	U	1.	U	1.	U	1.	U	1.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA													
	SAMPLE ID ------->	039-G-0067-50		039-G-0067-60		039-G-0068-40		039-G-0068-50		039-G-0068-60		039-G-0068-70	
	ORIGINAL ID ----->	039G006750		039G006760		039G006840		039G006850		039G006860		039G006870	
	LAB SAMPLE ID --->	9901775-01		9901775-02		9901775-03		9901775-04		9901775-06		9901792-01	
	ID FROM REPORT -->	039G006750		039G006760		039G006840		039G006850		039G006860		039G006870	
	SAMPLE DATE ----->	01/27/99		01/27/99		01/28/99		01/28/99		01/28/99		01/28/99	
	DATE ANALYZED --->	01/29/99		01/29/99		01/29/99		01/29/99		01/29/99		02/01/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	9901775	VAL	9901775	VAL	9901775	VAL	9901775	VAL	9901775	VAL	9901792	VAL
1330-20-7	Xylene (Total)	NR		NR		NR		NR		NR		NR	
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA								
	SAMPLE ID ------->	039-G-0068-80		039-G-034A-40				
	ORIGINAL ID ----->	039G006880		039G034A40				
	LAB SAMPLE ID --->	9901775-05		9812133-03				
	ID FROM REPORT -->	039G006880		039G034A40				
	SAMPLE DATE ----->	01/28/99		12/02/98				
	DATE ANALYZED --->	01/29/99		12/04/98				
	MATRIX ---------->	Water		Water				
	UNITS ---------->	UG/L		UG/L				
CAS #	Parameter	9901775	VAL	9812133	VAL			
75-00-3	Chloroethane	1.	U	1.	U			
75-69-4	Trichlorofluoromethane	1.	U	1.	U			
75-35-4	1,1-Dichloroethene	1.	U	1.	U			
75-09-2	Methylene chloride	10.	U	20.	U			
156-60-5	trans-1,2-Dichloroethene	1.	U	1.	U			
75-34-3	1,1-Dichloroethane	1.	U	1.	U			
594-20-7	2,2-Dichloropropane	1.	U	1.	U			
156-59-2	cis-1,2-Dichloroethene	1.	U	1.	U			
67-66-3	Chloroform	1.	U	1.	U			
74-97-5	Chlorobromomethane	1.	U	1.	U			
71-55-6	1,1,1-Trichloroethane	1.	U	1.	U			
563-58-6	1,1-Dichloropropene	1.	U	1.	U			
56-23-5	Carbon tetrachloride	1.	U	1.	U			
107-06-2	1,2-Dichloroethane	1.	U	1.	U			
71-43-2	Benzene	1.	U	1.	U			
79-01-6	Trichloroethene	1.	U	1.	U			
78-87-5	1,2-Dichloropropane	1.	U	1.	U			
75-27-4	Bromodichloromethane	1.	U	1.	U			
74-95-3	Dibromomethane	1.	U	1.	U			
10061-01-5	cis-1,3-Dichloropropene	1.	U	1.	U			
108-88-3	Toluene	5.	U	1.	U			
10061-02-6	trans-1,3-Dichloropropene	1.	U	1.	U			
79-00-5	1,1,2-Trichloroethane	1.	U	1.	U			
142-28-9	1,3-Dichloropropane	1.	U	1.	U			
127-18-4	Tetrachloroethene	5.	U	1.	U			
124-48-1	Dibromochloromethane	1.	U	1.	U			
106-93-4	1,2-Dibromoethane	1.	U	1.	U			
108-90-7	Chlorobenzene	1.	U	1.	U			
100-41-4	Ethylbenzene	1.	U	1.	U			
630-20-6	1,1,1,2-Tetrachloroethane	1.	U	1.	U			
9999900-05-0	m+p Xylene	1.	U	1.	U			
95-47-6	o-Xylene	1.	U	1.	U			
100-42-5	Styrene	1.	U	1.	U			
98-82-8	Benzene, 1-methylethyl-	1.	U	1.	U			
75-25-2	Bromoform	1.	U	1.	U			
79-34-5	1,1,2,2-Tetrachloroethane	1.	U	1.	U			
96-18-4	1,2,3-Trichloropropane	1.	U	1.	U			

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA								
	SAMPLE ID ------->	039-G-0068-80		039-G-034A-40				
	ORIGINAL ID ----->	039G006880		039G034A40				
	LAB SAMPLE ID --->	9901775-05		9812133-03				
	ID FROM REPORT -->	039G006880		039G034A40				
	SAMPLE DATE ----->	01/28/99		12/02/98				
	DATE ANALYZED --->	01/29/99		12/04/98				
	MATRIX ---------->	Water		Water				
	UNITS ---------->	UG/L		UG/L				
CAS #	Parameter	9901775	VAL	9812133	VAL			
103-65-1	n-Propylbenzene	1.	U	1.	U			
108-86-1	Bromobenzene	1.	U	1.	U			
108-67-8	Benzene, 1,3,5-trimethyl-	1.	U	1.	U			
95-49-8	2-Chlorotoluene	1.	U	1.	U			
106-43-4	4-Chlorotoluene	1.	U	1.	U			
98-06-6	tert-Butylbenzene	1.	U	1.	U			
95-63-6	Benzene, 1,2,4-trimethyl	1.	U	1.	U			
135-98-8	sec-Butylbenzene	1.	U	1.	U			
99-87-6	p-Isopropyltoluene	1.	U	1.	U			
541-73-1	1,3-Dichlorobenzene	1.	U	1.	U			
106-46-7	1,4-Dichlorobenzene	1.	U	1.	U			
104-51-8	n-Butylbenzene	1.	U	1.	U			
95-50-1	1,2-Dichlorobenzene	1.	U	1.	U			
96-12-8	1,2-Dibromo-3-Chloropropane	1.	U	1.	U			
120-82-1	1,2,4-Trichlorobenzene	1.	U	1.	U			
87-68-3	Hexachlorobutadiene	1.	U	1.	U			
91-20-3	Naphthalene	1.	U	1.	U			
87-61-6	1,2,3-Trichlorobenzene	1.	U	1.	U			
75-71-8	Dichlorodifluoromethane	1.	UJ	1.	U			
74-87-3	Chloromethane	1.	U	1.	U			
75-01-4	Vinyl chloride	1.	U	1.	U			
74-83-9	Bromomethane	1.	U	1.	U			
67-64-1	Acetone	20.	U	20.	U			
107-02-8	Acrolein	20.	U	20.	U			
107-13-1	Acrylonitrile	20.	U	20.	U			
78-93-3	2-Butanone (MEK)	20.	U	20.	U			
75-15-0	Carbon disulfide	1.	U	1.	U			
110-75-8	2-Chloroethylvinylether	5.	U	20.	U			
591-78-6	2-Hexanone	5.	U	5.	U			
74-88-4	Methyl iodide	1.	U	1.	U			
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U			
108-05-4	Vinyl acetate	10.	U	20.	U			
9999900-00-8	1,3,5-Trimethylbenzene	NR		NR				
9999900-00-3	Isopropylbenzene	NR		NR				
75-05-8	Acetonitrile	50.	U	NR				
141-78-6	Ethyl acetate	5.	U	NR				
1634-04-4	Methyl tert-butyl ether	1.	U	NR				

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 DPT PHASE
VOCs in Fluvial Deposits Groundwater

8260-VOA							
	SAMPLE ID ------->	039-G-0068-80		039-G-034A-40			
	ORIGINAL ID ----->	039G006880		039G034A40			
	LAB SAMPLE ID --->	9901775-05		9812133-03			
	ID FROM REPORT -->	039G006880		039G034A40			
	SAMPLE DATE ----->	01/28/99		12/02/98			
	DATE ANALYZED --->	01/29/99		12/04/98			
	MATRIX ---------->	Water		Water			
	UNITS ---------->	UG/L		UG/L			
CAS #	Parameter	9901775	VAL	9812133	VAL		
1330-20-7	Xylene (Total)	NR		NR			
110-57-6	trans-1,4-Dichloro-2-butene	NR		NR			

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 Well Phase
VOCs in Fluvial Deposits Groundwater

SW846-VOA													
	SAMPLE ID ------->	039-G-01LF-48		039-G-01LF-58		039-G-01LF-69		039-G-02LF-43		039-G-02LF-50		039-G-02LF-71	
	ORIGINAL ID ----->	039G01LF48		039G01LF58		039G01LF69		039G02LF43		039G02LF50		039G02LF71	
	LAB SAMPLE ID --->	9906570-17		9906570-18		9906570-19		9906570-20		9906571-01		9906571-02	
	ID FROM REPORT -->	039G01LF48		039G01LF58		039G01LF69		039G02LF43		039G02LF50		039G02LF71	
	SAMPLE DATE ----->	06/22/99		06/22/99		06/22/99		06/22/99		06/22/99		06/22/99	
	DATE EXTRACTED -->	06/24/99		06/25/99		06/25/99		06/25/99		06/24/99		06/24/99	
	DATE ANALYZED --->	06/24/99		06/25/99		06/25/99		06/25/99		06/24/99		06/24/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	MS025	VAL	MS025	VAL	MS025	VAL	MS025	VAL	MS026	VAL	MS026	VAL
74-87-3	Chloromethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-01-4	Vinyl chloride	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
74-83-9	Bromomethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-00-3	Chloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-35-4	1,1-Dichloroethene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
67-64-1	Acetone	5.	UR	5.	UR	5.	UR	5.	UR	5.	U	3.	J
75-15-0	Carbon disulfide	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-09-2	Methylene chloride	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-34-3	1,1-Dichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
78-93-3	2-Butanone (MEK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
67-66-3	Chloroform	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
71-55-6	1,1,1-Trichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
56-23-5	Carbon tetrachloride	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
71-43-2	Benzene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
107-06-2	1,2-Dichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
79-01-6	Trichloroethene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
78-87-5	1,2-Dichloropropane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-27-4	Bromodichloromethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
10061-01-5	cis-1,3-Dichloropropene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-88-3	Toluene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
10061-02-6	trans-1,3-Dichloropropene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
79-00-5	1,1,2-Trichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
127-18-4	Tetrachloroethene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
1330-20-7	Xylene (Total)	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
124-48-1	Dibromochloromethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
540-59-0	1,2-Dichloroethene (total)	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
108-90-7	Chlorobenzene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
100-41-4	Ethylbenzene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
100-42-5	Styrene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-25-2	Bromoform	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
79-34-5	1,1,2,2-Tetrachloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
156-60-5	trans-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	
156-59-2	cis-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 Well Phase
VOCs in Fluvial Deposits Groundwater

SW846-VOA													
	SAMPLE ID ------->	039-G-02LF-85		039-G-03LF-43		039-G-03LF-73		039-G-03LF-99		039-G-04LF-47		039-G-04LF-57	
	ORIGINAL ID ----->	039G02LF85		039G03LF43		039G03LF73		039G03LF99		039G04LF47		039G04LF57	
	LAB SAMPLE ID --->	9906571-03		9906571-04		9906571-05		9906571-06		9906571-07		9906571-08	
	ID FROM REPORT -->	039G02LF85		039G03LF43		039G03LF73		039G03LF99		039G04LF47		039G04LF57	
	SAMPLE DATE ----->	06/22/99		06/22/99		06/22/99		06/22/99		06/22/99		06/22/99	
	DATE EXTRACTED -->	06/24/99		06/24/99		06/24/99		06/24/99		06/24/99		06/24/99	
	DATE ANALYZED --->	06/24/99		06/24/99		06/24/99		06/24/99		06/24/99		06/24/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	MS026	VAL	MS026	VAL	MS026	VAL	MS026	VAL	MS026	VAL	MS026	VAL
74-87-3	Chloromethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-01-4	Vinyl chloride	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
74-83-9	Bromomethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-00-3	Chloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-35-4	1,1-Dichloroethene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
67-64-1	Acetone	6.	J	4.	J	5.	J	2.	J	1.	J	2.	J
75-15-0	Carbon disulfide	3.	U	1.	J	3.	U	3.	U	3.	U	3.	U
75-09-2	Methylene chloride	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-34-3	1,1-Dichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
78-93-3	2-Butanone (MEK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
67-66-3	Chloroform	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
71-55-6	1,1,1-Trichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
56-23-5	Carbon tetrachloride	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
71-43-2	Benzene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
107-06-2	1,2-Dichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
79-01-6	Trichloroethene	3.	U	67.		57.		66.		50.		73.	
78-87-5	1,2-Dichloropropane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-27-4	Bromodichloromethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
10061-01-5	cis-1,3-Dichloropropene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-88-3	Toluene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
10061-02-6	trans-1,3-Dichloropropene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
79-00-5	1,1,2-Trichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
127-18-4	Tetrachloroethene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
1330-20-7	Xylene (Total)	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
124-48-1	Dibromochloromethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
540-59-0	1,2-Dichloroethene (total)	3.	U	23.		2.	J	2.	J	3.	U	10.	
108-90-7	Chlorobenzene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
100-41-4	Ethylbenzene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
100-42-5	Styrene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-25-2	Bromoform	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
79-34-5	1,1,2,2-Tetrachloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
156-60-5	trans-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	
156-59-2	cis-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 Well Phase
VOCs in Fluvial Deposits Groundwater

SW846-VOA													
	SAMPLE ID ------->	039-G-04LF-61		039-G-04LF-69		039-G-05LF-43		039-G-05LF-50		039-G-05LF-73		039-G-05LF-90	
	ORIGINAL ID ----->	039G04LF61		039G04LF69		039G05LF43		039G05LF50		039G05LF73		039G05LF90	
	LAB SAMPLE ID --->	9906571-09		9906571-10		9906570-01		9906570-02		9906570-03		9906570-04	
	ID FROM REPORT -->	039G04LF61		039G04LF69		039G05LF43		039G05LF50		039G05LF73		039G05LF90	
	SAMPLE DATE ----->	06/22/99		06/22/99		06/22/99		06/22/99		06/22/99		06/22/99	
	DATE EXTRACTED -->	06/24/99		06/24/99		06/24/99		06/24/99		06/24/99		06/24/99	
	DATE ANALYZED --->	06/24/99		06/24/99		06/24/99		06/24/99		06/24/99		06/24/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	MS026	VAL	MS026	VAL	MS025	VAL	MS025	VAL	MS025	VAL	MS025	VAL
74-87-3	Chloromethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-01-4	Vinyl chloride	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
74-83-9	Bromomethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-00-3	Chloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-35-4	1,1-Dichloroethene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
67-64-1	Acetone	3.	J	2.	J	6.	J	5.	UR	5.	UR	5.	UR
75-15-0	Carbon disulfide	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-09-2	Methylene chloride	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-34-3	1,1-Dichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
78-93-3	2-Butanone (MEK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
67-66-3	Chloroform	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
71-55-6	1,1,1-Trichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
56-23-5	Carbon tetrachloride	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
71-43-2	Benzene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
107-06-2	1,2-Dichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
79-01-6	Trichloroethene	73.		83.		3.	U	3.	U	3.	U	3.	U
78-87-5	1,2-Dichloropropane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-27-4	Bromodichloromethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
10061-01-5	cis-1,3-Dichloropropene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-88-3	Toluene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
10061-02-6	trans-1,3-Dichloropropene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
79-00-5	1,1,2-Trichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
127-18-4	Tetrachloroethene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
1330-20-7	Xylene (Total)	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
124-48-1	Dibromochloromethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
540-59-0	1,2-Dichloroethene (total)	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
108-90-7	Chlorobenzene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
100-41-4	Ethylbenzene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
100-42-5	Styrene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-25-2	Bromoform	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
79-34-5	1,1,2,2-Tetrachloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
156-60-5	trans-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	
156-59-2	cis-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 Well Phase
VOCs in Fluvial Deposits Groundwater

SW846-VOA													
	SAMPLE ID ------->	039-H-05LF-90		039-G-06LF-43		039-G-06LF-56		039-G-06LF-67		039-G-07LF-43		039-G-07LF-56	
	ORIGINAL ID ----->	039H05LF90		039G06LF43		039G06LF56		039G06LF67		039G07LF43		039G07LF56	
	LAB SAMPLE ID --->	9906570-05		9906570-06		9906570-07		9906570-08		9906570-09		9906570-10	
	ID FROM REPORT -->	039H05LF90		039G06LF43		039G06LF56		039G06LF67		039G07LF43		039G07LF56	
	SAMPLE DATE ----->	06/22/99		06/22/99		06/22/99		06/22/99		06/22/99		06/22/99	
	DATE EXTRACTED -->	06/24/99		06/24/99		06/24/99		06/24/99		06/24/99		06/24/99	
	DATE ANALYZED --->	06/24/99		06/24/99		06/24/99		06/24/99		06/24/99		06/24/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	MS025	VAL	MS025	VAL	MS025	VAL	MS025	VAL	MS025	VAL	MS025	VAL
74-87-3	Chloromethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-01-4	Vinyl chloride	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
74-83-9	Bromomethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-00-3	Chloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-35-4	1,1-Dichloroethene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
67-64-1	Acetone	5.	UR	5.	UR	5.	UR	5.	UR	5.	UR	5.	UR
75-15-0	Carbon disulfide	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-09-2	Methylene chloride	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-34-3	1,1-Dichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
78-93-3	2-Butanone (MEK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
67-66-3	Chloroform	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
71-55-6	1,1,1-Trichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
56-23-5	Carbon tetrachloride	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
71-43-2	Benzene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
107-06-2	1,2-Dichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
79-01-6	Trichloroethene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
78-87-5	1,2-Dichloropropane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-27-4	Bromodichloromethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
10061-01-5	cis-1,3-Dichloropropene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-88-3	Toluene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
10061-02-6	trans-1,3-Dichloropropene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
79-00-5	1,1,2-Trichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
127-18-4	Tetrachloroethene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
1330-20-7	Xylene (Total)	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
124-48-1	Dibromochloromethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
540-59-0	1,2-Dichloroethene (total)	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
108-90-7	Chlorobenzene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
100-41-4	Ethylbenzene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
100-42-5	Styrene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-25-2	Bromoform	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
79-34-5	1,1,2,2-Tetrachloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
156-60-5	trans-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	
156-59-2	cis-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 Well Phase
VOCs in Fluvial Deposits Groundwater

SW846-VOA															
	SAMPLE ID ------->	039-G-07LF-70		039-G-07LF-87		039-G-08LF-45		039-G-08LF-53		039-G-08LF-73		039-H-08LF-73	
	ORIGINAL ID ----->	039G07LF70		039G07LF87		039G08LF45		039G08LF53		039G08LF73		039H08LF73	
	LAB SAMPLE ID --->	9906570-11		9906570-12		9906570-13		9906570-14		9906570-15		9906570-16	
	ID FROM REPORT -->	039G07LF70		039G07LF87		039G08LF45		039G08LF53		039G08LF73		039H08LF73	
	SAMPLE DATE ----->	06/22/99		06/22/99		06/22/99		06/22/99		06/22/99		06/22/99	
	DATE EXTRACTED -->	06/24/99		06/24/99		06/24/99		06/24/99		06/24/99		06/24/99	
	DATE ANALYZED --->	06/24/99		06/24/99		06/24/99		06/24/99		06/24/99		06/24/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	MS025	VAL	MS025	VAL	MS025	VAL	MS025	VAL	MS025	VAL	MS025	VAL
74-87-3	Chloromethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-01-4	Vinyl chloride	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
74-83-9	Bromomethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-00-3	Chloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-35-4	1,1-Dichloroethene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
67-64-1	Acetone	5.	UR	5.	UR	5.	UR	5.	UR	5.	UR	5.	UR
75-15-0	Carbon disulfide	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-09-2	Methylene chloride	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-34-3	1,1-Dichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
78-93-3	2-Butanone (MEK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
67-66-3	Chloroform	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
71-55-6	1,1,1-Trichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
56-23-5	Carbon tetrachloride	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
71-43-2	Benzene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
107-06-2	1,2-Dichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
79-01-6	Trichloroethene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
78-87-5	1,2-Dichloropropane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-27-4	Bromodichloromethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
10061-01-5	cis-1,3-Dichloropropene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
108-88-3	Toluene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
10061-02-6	trans-1,3-Dichloropropene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
79-00-5	1,1,2-Trichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
127-18-4	Tetrachloroethene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	5.	U
1330-20-7	Xylene (Total)	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
124-48-1	Dibromochloromethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
540-59-0	1,2-Dichloroethene (total)	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
108-90-7	Chlorobenzene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
100-41-4	Ethylbenzene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
100-42-5	Styrene	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
75-25-2	Bromoform	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
79-34-5	1,1,2,2-Tetrachloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	3.	U
156-60-5	trans-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	
156-59-2	cis-1,2-Dichloroethene	NR		NR		NR		NR		NR		NR	

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 Well Phase
VOCs in Fluvial Deposits Groundwater

SW846-VOA															
	SAMPLE ID ------->	039-G-08LF-91		039-G-09LF-48		039-G-09LF-62		039-G-09LF-71		039-G-09LF-91		039-G-A2LF-00	
	ORIGINAL ID ----->	039G08LF91		039G09LF48		039G09LF62		039G09LF71		039G09LF91		039GA2LF00	
	LAB SAMPLE ID --->	9906571-11		9906571-12		9906571-13		9906571-14		9906571-15		S915337*4	
	ID FROM REPORT -->	039G08LF91		039G09LF48		039G09LF62		039G09LF71		039G09LF91		039GA2LF00	
	SAMPLE DATE ----->	06/22/99		06/22/99		06/22/99		06/22/99		06/22/99		08/10/99	
	DATE EXTRACTED -->	06/24/99		06/24/99		06/24/99		06/24/99		06/24/99			
	DATE ANALYZED --->	06/24/99		06/24/99		06/24/99		06/24/99		06/24/99		08/16/99	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	MS026	VAL	MS026	VAL	MS026	VAL	MS026	VAL	MS026	VAL	MEM73	VAL
74-87-3	Chloromethane	3.	U	3.	U	3.	U	3.	U	3.	U	10.	U
75-01-4	Vinyl chloride	3.	U	3.	U	3.	U	3.	U	3.	U	10.	U
74-83-9	Bromomethane	3.	U	3.	U	3.	U	3.	U	3.	U	10.	U
75-00-3	Chloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	10.	U
75-35-4	1,1-Dichloroethene	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
67-64-1	Acetone	7.	J	2.	J	3.	J	2.	J	2.	J	50.	U
75-15-0	Carbon disulfide	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
75-09-2	Methylene chloride	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
75-34-3	1,1-Dichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
78-93-3	2-Butanone (MEK)	5.	U	5.	U	5.	U	5.	U	5.	U	25.	U
67-66-3	Chloroform	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
71-55-6	1,1,1-Trichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
56-23-5	Carbon tetrachloride	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
71-43-2	Benzene	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
107-06-2	1,2-Dichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
79-01-6	Trichloroethene	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
78-87-5	1,2-Dichloropropane	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
75-27-4	Bromodichloromethane	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
10061-01-5	cis-1,3-Dichloropropene	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.	U	5.	U	5.	U	5.	U	5.	U	25.	U
108-88-3	Toluene	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
10061-02-6	trans-1,3-Dichloropropene	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
79-00-5	1,1,2-Trichloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
127-18-4	Tetrachloroethene	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
591-78-6	2-Hexanone	5.	U	5.	U	5.	U	5.	U	5.	U	25.	U
1330-20-7	Xylene (Total)	3.	U	3.	U	3.	U	3.	U	3.	U	10.	U
124-48-1	Dibromochloromethane	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
540-59-0	1,2-Dichloroethene (total)	3.	U	3.	U	3.	U	3.	U	3.	U	NR	
108-90-7	Chlorobenzene	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
100-41-4	Ethylbenzene	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
100-42-5	Styrene	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
75-25-2	Bromoform	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	3.	U	3.	U	3.	U	3.	U	3.	U	5.	U
156-60-5	trans-1,2-Dichloroethene	NR		NR		NR		NR		NR		5.	U
156-59-2	cis-1,2-Dichloroethene	NR		NR		NR		NR		NR		5.	U

*** Validation Complete ***

NSA MID-SOUTH
RFI, ASSEMBLY F, SWMU 39 Well Phase
VOCs in Fluvial Deposits Groundwater

SW846-VOA									
	SAMPLE ID ------->	039-G-A4LF-60		039-G-A4LF-60		039-G-A5LF-50		039-G-A9LF-50	
	ORIGINAL ID ----->	039GA4LF60		039GH4LF60		039GA5LF50		039GA9LF50	
	LAB SAMPLE ID --->	S915337*1		S915337*6		S915337*3		S915337*2	
	ID FROM REPORT -->	039GA4LF60		039GH4LF60		039GA5LF50		039GA9LF50	
	SAMPLE DATE ----->	08/10/99		08/10/99		08/10/99		08/10/99	
	DATE ANALYZED --->	08/17/99		08/16/99		08/16/99		08/16/99	
	MATRIX ---------->	Water		Water		Water		Water	
	UNITS ---------->	UG/L		UG/L		UG/L		UG/L	
CAS #	Parameter	MEM73	VAL	MEM73	VAL	MEM73	VAL	MEM73	VAL
74-87-3	Chloromethane	8.9	J	15.		10.	U	10.	U
75-01-4	Vinyl chloride	10.	U	10.	U	10.	U	10.	U
74-83-9	Bromomethane	10.	U	10.	U	10.	U	10.	U
75-00-3	Chloroethane	10.	U	10.	U	10.	U	10.	U
75-35-4	1,1-Dichloroethene	5.	U	5.	U	5.	U	5.	U
67-64-1	Acetone	50.	U	50.	U	50.	U	50.	U
75-15-0	Carbon disulfide	1.3	J	5.	U	5.	U	5.	U
75-09-2	Methylene chloride	5.	U	5.	U	5.	U	5.	U
75-34-3	1,1-Dichloroethane	5.	U	5.	U	5.	U	5.	U
78-93-3	2-Butanone (MEK)	25.	U	25.	U	25.	U	25.	U
67-66-3	Chloroform	5.	U	5.	U	5.	U	5.	U
71-55-6	1,1,1-Trichloroethane	5.	U	5.	U	5.	U	5.	U
56-23-5	Carbon tetrachloride	5.	U	5.	U	5.	U	5.	U
71-43-2	Benzene	5.	U	5.	U	5.	U	5.	U
107-06-2	1,2-Dichloroethane	5.	U	5.	U	5.	U	5.	U
79-01-6	Trichloroethene	55.		80.		5.	U	5.	U
78-87-5	1,2-Dichloropropane	5.	U	5.	U	5.	U	5.	U
75-27-4	Bromodichloromethane	5.	U	5.	U	5.	U	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U	5.	U	5.	U	5.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	25.	U	25.	U	25.	U	25.	U
108-88-3	Toluene	5.	U	0.65	J	5.	U	0.3	J
10061-02-6	trans-1,3-Dichloropropene	5.	U	5.	U	5.	U	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U	5.	U	5.	U	5.	U
127-18-4	Tetrachloroethene	5.	U	5.	U	5.	U	5.	U
591-78-6	2-Hexanone	25.	U	25.	U	25.	U	25.	U
1330-20-7	Xylene (Total)	10.	U	0.66	J	10.	U	0.37	J
124-48-1	Dibromochloromethane	5.	U	5.	U	5.	U	5.	U
540-59-0	1,2-Dichloroethene (total)	NR		NR		NR		NR	
108-90-7	Chlorobenzene	5.	U	5.	U	5.	U	5.	U
100-41-4	Ethylbenzene	5.	U	5.	U	5.	U	5.	U
100-42-5	Styrene	5.	U	5.	U	5.	U	5.	U
75-25-2	Bromoform	5.	U	5.	U	5.	U	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U	5.	U	5.	U	5.	U
156-60-5	trans-1,2-Dichloroethene	5.	U	5.	U	5.	U	5.	U
156-59-2	cis-1,2-Dichloroethene	1.1	J	5.	U	5.	U	5.	U

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 63 VOCs in Subsurface Soil

SW846-VOA

SAMPLE ID -------->	063-S-GB01-08
ORIGINAL ID ----->	063SGB0108
LAB SAMPLE ID --->	155911
ID FROM REPORT -->	063sgb0108
SAMPLE DATE ----->	
DATE ANALYZED --->	10/23/96
MATRIX ---------->	Soil
UNITS ---------->	ug/Kg

CAS #	Parameter	2056	VAL
74-87-3	Chloromethane	13.	U
74-83-9	Bromomethane	13.	U
75-01-4	Vinyl chloride	13.	U
75-00-3	Chloroethane	13.	U
75-09-2	Methylene chloride	13.	U
67-64-1	Acetone	120.	
75-15-0	Carbon disulfide	13.	U
75-35-4	1,1-Dichloroethene	13.	U
75-34-3	1,1-Dichloroethane	13.	U
540-59-0	1,2-Dichloroethene (total)	13.	U
67-66-3	Chloroform	13.	U
107-06-2	1,2-Dichloroethane	13.	U
78-93-3	2-Butanone (MEK)	13.	U
71-55-6	1,1,1-Trichloroethane	13.	U
56-23-5	Carbon tetrachloride	13.	U
75-27-4	Bromodichloromethane	13.	U
78-87-5	1,2-Dichloropropane	13.	U
10061-01-5	cis-1,3-Dichloropropene	13.	U
79-01-6	Trichloroethene	13.	U
124-48-1	Dibromochloromethane	13.	U
79-00-5	1,1,2-Trichloroethane	13.	U
71-43-2	Benzene	13.	U
10061-02-6	trans-1,3-Dichloropropene	13.	U
75-25-2	Bromoform	13.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	13.	U
591-78-6	2-Hexanone	13.	U
127-18-4	Tetrachloroethene	13.	U
79-34-5	1,1,2,2-Tetrachloroethane	13.	U
108-88-3	Toluene	13.	U
108-90-7	Chlorobenzene	13.	U
100-41-4	Ethylbenzene	13.	U
100-42-5	Styrene	13.	U
1330-20-7	Xylene (Total)	13.	U

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 63 VOCs in Subsurface Soil

SW846-VOA									
	SAMPLE ID ------->	063-S-GB01-08		063-S-GB01-16					
	ORIGINAL ID ----->	063SGB0108		063SGB0116					
	LAB SAMPLE ID --->	063S0108		063S0116					
	ID FROM REPORT -->	063SGB0108		063SGB0116					
	SAMPLE DATE ----->	10/21/96		10/21/96					
	DATE ANALYZED --->	10/21/96		10/21/96					
	MATRIX ---------->	Soil		Soil					
	UNITS ---------->	ug/KG		ug/KG					
CAS #	Parameter	1	VAL	1	VAL				
74-87-3	Chloromethane	10.	UJ	10.	UJ				
74-83-9	Bromomethane	10.	U	10.	U				
75-01-4	Vinyl chloride	10.	U	10.	U				
75-09-2	Methylene chloride	28.	U	27.	U				
67-64-1	Acetone	100.	U	100.	U				
75-15-0	Carbon disulfide	10.	UJ	10.	UJ				
75-35-4	1,1-Dichloroethene	10.	U	10.	U				
75-34-3	1,1-Dichloroethane	10.	U	10.	U				
540-59-0	1,2-Dichloroethene (total)	10.	U	10.	U				
67-66-3	Chloroform	10.	U	10.	U				
107-06-2	1,2-Dichloroethane	10.	UJ	10.	UJ				
78-93-3	2-Butanone (MEK)	50.	U	50.	U				
71-55-6	1,1,1-Trichloroethane	10.	U	10.	U				
56-23-5	Carbon tetrachloride	10.	UJ	10.	UJ				
75-27-4	Bromodichloromethane	10.	U	10.	U				
78-87-5	1,2-Dichloropropane	10.	U	10.	U				
10061-01-5	cis-1,3-Dichloropropene	10.	U	10.	U				
79-01-6	Trichloroethene	10.	U	10.	U				
124-48-1	Dibromochloromethane	10.	U	10.	U				
79-00-5	1,1,2-Trichloroethane	10.	U	10.	U				
71-43-2	Benzene	10.	UJ	10.	UJ				
10061-02-6	trans-1,3-Dichloropropene	10.	U	10.	U				
75-25-2	Bromoform	10.	UJ	10.	UJ				
108-10-1	4-Methyl-2-Pentanone (MIBK)	50.	U	50.	U				
591-78-6	2-Hexanone	50.	U	50.	U				
127-18-4	Tetrachloroethene	10.	U	10.	U				
79-34-5	1,1,2,2-Tetrachloroethane	10.	UJ	10.	UJ				
108-88-3	Toluene	10.	U	10.	U				
108-90-7	Chlorobenzene	10.	U	10.	U				
100-41-4	Ethylbenzene	10.	U	10.	U				
100-42-5	Styrene	10.	U	10.	U				
75-71-8	Dichlorodifluoromethane	10.	U	10.	U				
75-69-4	Trichlorofluoromethane	10.	U	10.	U				
142-28-9	1,3-Dichloropropane	10.	U	10.	U				
108-38-3	m-Xylene	20.	UJ	20.	UJ				
95-47-6	o-Xylene	10.	UJ	10.	UJ				

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 63 VOCs in Surface Soil

SW846-VOA

SAMPLE ID -------->	063-S-GB01-01
ORIGINAL ID ----->	063SGB0101
LAB SAMPLE ID --->	063S0101
ID FROM REPORT -->	063SGB0101
SAMPLE DATE ----->	10/18/96
DATE ANALYZED --->	10/18/96
MATRIX ---------->	Soil
UNITS ---------->	ug/KG

CAS #	Parameter	1	VAL
74-87-3	Chloromethane	10.	UJ
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl chloride	10.	U
75-09-2	Methylene chloride	34.	U
67-64-1	Acetone	100.	U
75-15-0	Carbon disulfide	10.	UJ
75-35-4	1,1-Dichloroethene	10.	U
75-34-3	1,1-Dichloroethane	10.	UJ
540-59-0	1,2-Dichloroethene (total)	10.	U
67-66-3	Chloroform	10.	U
107-06-2	1,2-Dichloroethane	10.	U
78-93-3	2-Butanone (MEK)	50.	UJ
71-55-6	1,1,1-Trichloroethane	10.	U
56-23-5	Carbon tetrachloride	10.	U
75-27-4	Bromodichloromethane	10.	U
78-87-5	1,2-Dichloropropane	10.	U
10061-01-5	cis-1,3-Dichloropropene	10.	U
79-01-6	Trichloroethene	10.	U
124-48-1	Dibromochloromethane	10.	U
79-00-5	1,1,2-Trichloroethane	10.	U
71-43-2	Benzene	10.	U
10061-02-6	trans-1,3-Dichloropropene	10.	U
75-25-2	Bromoform	10.	UJ
108-10-1	4-Methyl-2-Pentanone (MIBK)	50.	U
591-78-6	2-Hexanone	50.	U
127-18-4	Tetrachloroethene	10.	U
79-34-5	1,1,2,2-Tetrachloroethane	10.	UJ
108-88-3	Toluene	10.	U
108-90-7	Chlorobenzene	10.	U
100-41-4	Ethylbenzene	10.	U
100-42-5	Styrene	10.	U
75-71-8	Dichlorodifluoromethane	10.	U
75-69-4	Trichlorofluoromethane	10.	U
142-28-9	1,3-Dichloropropane	10.	U
108-38-3	m-Xylene	20.	UJ
95-47-6	o-Xylene	10.	UJ

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH, CSI, ASSEMBLY F
SWMU 63 VOCs in Groundwater

SW846-VOA

SAMPLE ID -------->	063-G-GB01-47
ORIGINAL ID ----->	063GGB0147
LAB SAMPLE ID --->	063G0147
ID FROM REPORT -->	063GGB0147
SAMPLE DATE ----->	10/21/96
DATE ANALYZED --->	10/21/96
MATRIX ---------->	Water
UNITS ---------->	ug/L

CAS #	Parameter	1	VAL
74-87-3	Chloromethane	10.	UJ
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl chloride	10.	U
75-09-2	Methylene chloride	10.	U
67-64-1	Acetone	100.	U
75-15-0	Carbon disulfide	10.	UJ
75-35-4	1,1-Dichloroethene	10.	U
75-34-3	1,1-Dichloroethane	10.	U
540-59-0	1,2-Dichloroethene (total)	10.	U
67-66-3	Chloroform	10.	U
107-06-2	1,2-Dichloroethane	10.	UJ
78-93-3	2-Butanone (MEK)	50.	U
71-55-6	1,1,1-Trichloroethane	10.	U
56-23-5	Carbon tetrachloride	10.	UJ
75-27-4	Bromodichloromethane	10.	U
78-87-5	1,2-Dichloropropane	10.	U
10061-01-5	cis-1,3-Dichloropropene	10.	U
79-01-6	Trichloroethene	10.	U
124-48-1	Dibromochloromethane	10.	U
79-00-5	1,1,2-Trichloroethane	10.	U
71-43-2	Benzene	10.	UJ
10061-02-6	trans-1,3-Dichloropropene	10.	U
75-25-2	Bromoform	10.	UJ
108-10-1	4-Methyl-2-Pentanone (MIBK)	50.	U
591-78-6	2-Hexanone	50.	U
127-18-4	Tetrachloroethene	10.	U
79-34-5	1,1,2,2-Tetrachloroethane	10.	UJ
108-88-3	Toluene	10.	U
108-90-7	Chlorobenzene	10.	U
100-41-4	Ethylbenzene	10.	U
100-42-5	Styrene	10.	U
75-71-8	Dichlorodifluoromethane	10.	U
75-69-4	Trichlorofluoromethane	10.	U
142-28-9	1,3-Dichloropropane	10.	U
108-38-3	m-Xylene	20.	UJ
95-47-6	o-Xylene	10.	UJ

*** Validation Complete ***

Appendix D
Revision 1 General Human Health Risk Assessment (HHRA) Approach for NSA Memphis

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TECHNICAL MEMORANDUM

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FROM: Brian Mulhearn, E/A&H JBM

DATE: February 4, 1997

RE: Revision 1 General Human Health Risk Assessment (HHRA) Approach for NSA Memphis

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This memorandum discusses the general HHRA approach for NSA Memphis and incorporates USEPA's suggestions received during the January 28, 1997 Base Realignment and Closure (BRAC) Cleanup Team meeting. This text will not be reproduced in subsequent HHRAs with the exception of the final report, where the text will be included as an appendix. Initially, HHRAs will include only site-specific information and will reference this memorandum, reducing the bulk necessary to present site-specific risk information to risk managers. Deviations from these general methods will be justified and discussed in site-specific HHRAs.

1 BASELINE RISK ASSESSMENT

1.1 Introduction

A baseline risk assessment (BRA) establishes a baseline of risk to facilitate risk management decisions. Risk is the estimated potential for toxic effects on actual or hypothetical human or ecological receptors, while baseline risk refers to risk arising from exposures to chemicals assuming site conditions remain unchanged. BRAs are used by risk managers to decide if remedial actions are necessary and to determine the extent of remediation necessary to reduce the risk to acceptable levels. Generally, a BRA is divided into two sections, one assessing human health risk, and a second addressing ecological risk. This section addresses generally applied HHRA methods, while ecological risk assessment methods will be addressed in the site-specific assessments. Data management and analysis methods which will be used to reach the conclusions of site-specific HHRAs are discussed below. The following sections describe the methods, procedures, considerations, toxicological information, and related uncertainties possibly affecting HHRAs at NSA Memphis.

1.2 Background

The site background will be summarized in this section of the site-specific HHRAs.

2 General Guidance

HHRAs will generally be prepared in accordance with the guidelines set forth in the following documents, although some may not apply to every site:

- *Provisional Guidance for Quantitative Risk Assessment of PAHs*, U.S. Environmental Protection Agency, ECAO-CIN-842, EPA/600/BP92/001C, July 1993.

- *Risk Assessment Guidance for Superfund (RAGS), Volume I — Human Health Evaluation Manual, Part A*, U.S. Environmental Protection Agency/Office of Emergency and Remedial Response (OERR), EPA/540/1-89/002, December 1989 (Interim).

- *RAGS, Volume I — Human Health Evaluation Manual, (Part B, Development of Risk-Based Preliminary Remediation Goals)*, USEPA/OERR, EPA/540/R92/003, December 1991 (Interim).

- *RAGS, Volume I — Human Health Evaluation Manual, Supplemental Guidance — Standard Default Exposure Factors — Interim Final,* EPA/OERR, Office of Solid Waste and Emergency Response (OSWER) Directive: 9285.6-03, March 25, 1991. (RAGS Supplement).

- *RAGS, Volume I — Human Health Evaluation Manual, Supplemental Guidance-Dermal Risk Assessment — Interim Guidance,* EPA/OERR, August 18, 1992. (Supplemental Dermal Guidance).

- Supplemental Guidance to RAGS: Region IV Bulletin, *Development of Health-Based Preliminary Remediation Goals, Remedial Goal Options (RGO) and Remediation Levels* (Supplemental RGO Guidance).

- Supplemental Guidance to RAGS: Region IV Bulletin, *Provisional Guidance of Quantitative Risk Assessment of PAHs* (EPA Document EPA/600/R-93-089 July 1993).

- *Supplemental Guidance to RAGS: Calculating the Concentration Term*, May 1992.

- USEPA Region III *Selecting Exposure Routes and Contaminants of Concern by Risk-Based Table*, March 18, 1994, (RBC Screening Tables).

- USEPA Region III *Risk-Based Concentration Table*, January 1995, and subsequent versions (USEPA 1995).

2.1 Objectives

The objectives of the BRA will be to:

- Characterize the source media and determine the chemicals of potential concern (COPCs) for affected environmental media.

- Identify potential receptors and quantify their potential exposures under current and future conditions for all affected environmental media.

- Qualitatively and quantitatively evaluate the adverse effects associated with the site-specific COPCs in each medium.

- Characterize the baseline carcinogenic and noncarcinogenic risks associated with exposure to environmental media at the site(s) under current and future land use conditions.

- Evaluate the uncertainties related to exposure predictions, toxicological data, and resulting carcinogenic risk and noncarcinogenic hazard estimations.

- Establish Remedial Goal Options (RGOs) for chemicals of concern (COC) in each environmental medium based on risk/hazard to facilitate risk management decision-making.

The value of the risk assessment as a basis for making remedial decisions and determining whether detected site concentrations have the potential for toxic effects or increased cancer incidences depends upon adequately characterizing chemical contamination. Variables considered in characterizing the study area and its associated risk will include the amount, type, and location of sources; the pathways of exposure (media type and migration routes); and the

type, sensitivities, exposure duration, and dynamics of the exposed populations (receptors). Sampling activities typically consist of collecting surface (0 to 1-foot interval) and subsurface soil samples, and groundwater samples from monitoring wells installed in various water-bearing zones.

2.2 Organization

A human health risk assessment, as defined by RAGS Part A, includes the following steps:

- *Site characterization*: evaluation of data regarding site geography, geology, hydrogeology, climate, and demographics.

- *Data collection*: analysis of environmental media samples, including background/reference samples.

- *Data evaluation*: statistical analysis of analytical data to identify the nature and extent of contamination and to establish a preliminary list of COPCs based on risk-based and background screening. This list will subsequently be refined to identify COCs.

- *Exposure assessment*: identification of potential receptors under current and predicted conditions and potential exposure pathways, and calculation/quantitation of exposure point concentrations and chemical intakes.

- *Toxicity assessment*: qualitative evaluation of the adverse effects of the COPCs, and quantitative estimate of the relationship between exposure and severity or probability of effect.

- *Risk characterization*: combination of the output of the exposure and the toxicity assessments to quantify the total noncancer and cancer risk to the hypothetical receptors.

- *Uncertainty*: discussion and evaluation of the areas of recognized uncertainty in human health risk assessments in addition to medium - and exposure pathway-specific influences.

- *Risk/hazard summary*: presentation and discussion of the results of the quantification of exposure (risk and hazard) for the potential receptors and their exposure pathways identified under the current and future conditions.

- *RGOs*: computation of exposure concentrations corresponding to risk projections within the USEPA target risk range of 1E-6 to 1E-4 for carcinogenic COCs and hazard quotient goals of 0.1, 1, and 3 for noncarcinogenic COCs.

3 Site Characterization

When performing a HHRA, environmental media data are compiled to determine potential site-related chemicals and exposures as outlined in RAGS Part A. The steps identifying COPCs are discussed below.

3.1 Data Sources

The number of samples collected from each medium will be detailed in this section of the site-specific HHRAs, and tables will show which sample designations will be included and how data are grouped (when applicable). In addition, the analytical methods, the name of the analyzing laboratory, and data quality objectives will be referenced at this point in the HHRA.

3.2 Data Validation

Data validation is an after-the-fact, independent, systematic process of evaluating data and comparing them to established criteria to confirm they are of the technical quality necessary to support the decisions made in the RFI process. Parameters specific to the data are reviewed to determine whether they meet the stipulated DQOs. The quality objectives address five principal parameters: precision, accuracy, completeness, comparability, and representativeness. To

verify that these objectives are met, field measurements, sampling and handling procedures, laboratory analysis and reporting, and nonconformances and discrepancies in the data are examined to determine compliance with appropriate and applicable procedures.

Data for NSA Memphis will be validated in accordance with the methods outlined in the *Comprehensive RFI Work Plan* (E/A&H, 1994b). The data validation report will be referenced in this section of the HHRA.

3.3 Management of Site-Related Data

All environmental sampling data will be evaluated for suitability for use in the quantitative BRA. Data obtained via the following methods will be considered inappropriate:

- Analytical methods that are not specific for a particular chemical, such as total organic carbon, total organic halogen, or TPH (design parameter samples).

- Field screening instruments including total organic vapor monitoring units and organic vapor analyzers.

Additional data excluded will be detailed in the site-specific HHRAs.

Limitations of analytical results will be addressed in HHRAs by including estimated concentration values for reported nondetects. A nondetect indicates that the analyte was not detected above the practical quantitation limit of the sample ("U" qualified results), which is determined by the analytical method, the instrument used, and possible matrix interferences. However, a nondetected analyte could exist at a concentration between zero and the quantitation limit. For this reason, one-half the "U" value could serve as an unbiased estimate of the nondetect. Because the estimated values of "J" qualified hits are frequently much lower than the sample quantitation limits of "U" qualified nondetects for organic compounds, one-half of

each "U" value will be compared to one-half of the lowest hit (normally "J" qualified) at the same site. The lesser of these two values will be used as the best estimate of the concentration potentially present below the sample quantitation limit, and will be inserted into the adjusted dataset. For inorganic chemicals, the rule is simpler: One-half of each "U" value will be used to represent the concentration of the corresponding sample when compiling the adjusted dataset. If two nondetects are reported for any one location (a result of QA/QC samples), one-half the lesser of the "U" values will be compared to the lowest hit at the site (for organics, as above) or applied directly (for inorganics) to estimate a concentration value to be used in the NSA Memphis risk calculations. If a parameter is not detected at a site, neither data management method will be applied, and the parameter will not be considered in screening or formal assessment.

Once the dataset is complete, statistical methods will be used to evaluate the analytical results to (1) identify COPCs and (2) establish exposure point concentrations (EPCs) at potential receptor locations. The statistical methods used in data evaluation are discussed below. The rationale used to develop this methodology and the statistical techniques is based on the following sources:

- RAGS Part A
- *Supplemental Guidance to RAGS: Calculating the Concentration Term*, May 1992
- *Statistical Methods for Environmental Pollution Monitoring* (Gilbert, 1987)

Microsoft Fox Pro and Borland[1] Quattro Pro will typically be used for data management and statistical calculations. For each set of data used to describe the concentration of chemicals in a contaminated area, the following information will be tabulated in accordance with RAGS: frequency of detection, range of quantitation limits, range of detected values, and average of

1 *References to specific software products are not to be construed as an endorsement by the U.S. Navy or E/A&H.*

detected concentrations. For datasets of 10 or more, the upper confidence limit (UCL) on the mean of log-transformed values of the concentration will be presented. In accordance with RAGS, the lesser of either the maximum concentration detected or the UCL will be used to quantify potential exposure, as detailed in Section 4, Exposure Assessment.

3.4 Selection of COPCs

The substances detected (chemicals present in site samples, or CPSSs) will be screened to develop a list or group of COPCs. COPCs are, therefore, chemicals selected by comparison to screening concentrations, intrinsic toxicological properties, persistence, fate and transport characteristics, and cross-media transport potential. The nature and general extent of CPSSs will be referenced in this section of the site-specific HHRAs. To reduce the list of CPSSs and focus the risk assessment on COPCs, the following two comparisons will be performed.

3.4.1 Comparison of Site-Related Data to Risk-Based Screening Concentrations

The maximum concentrations of CPSSs detected during sampling will be compared to risk-based screening values. These values will be obtained from *Risk Based Screening Concentrations*, USEPA Region III, January through June, 1996 (and subsequent versions). As stated in the EPA Region III document, a risk goal of 1E-6 will be used to calculate screening concentrations for carcinogens. RBCs will be adjusted to reflect a target HQ of 0.1 for noncarcinogens, in accordance with USEPA Region IV *Supplemental Guidance to RAGS Bulletin 1* (USEPA, November 1995). Groundwater results will be compared to tap water screening values, and reported soil concentrations will be compared to residential soil screening values. CPSSs with maximum detected concentrations exceeding their corresponding concentrations, goals, levels, and/or standards will be evaluated further and compared to reference background concentrations. In addition, surrogate screening values based on toxicological similarities will be used if no screening value are available in USEPA's table, and surrogate screening values will be noted where applied.

The maximum concentration reported for each carcinogenic polycyclic aromatic hydrocarbon (PAH) will be compared to its corresponding screening value. In addition, all carcinogenic PAH concentrations reported at that location will be converted to the benzo(a)pyrene equivalent concentration (BEQ), which will be compared to the screening value for benzo(a)pyrene. PAH conversions will be performed using current Toxic Equivalency Factors (TEFs) for PAHs in accordance with USEPA Region IV *Supplemental Guidance to RAGS Bulletin 2* (USEPA, November 1995).

3.4.2 Comparison of Site-Related Data to Background Concentrations

Background data for NSA Memphis will be referenced in this section, or background reference concentrations from E/A&H's August 27, 1996 *Reference Concentrations* technical memorandum will be used. Following comparison to risk- and hazard-based screening values, CPSSs whose maximum detected concentrations exceeded corresponding background reference concentrations will be formally assessed in the HHRA, unless otherwise noted.

The maximum reported concentration of a CPSS will be compared to its reference background concentration (when applicable). This comparison helps account for naturally occurring elements, such as beryllium, manganese, and arsenic. Thus, risk and/or hazard associated with naturally occurring elements are not addressed where their concentrations are similar to corresponding background.

In the HHRA, if the maximum concentration of a CPSS is determined to be less than either two-times mean background or the risk-based screening values, then the CPSS will not be considered further unless deemed appropriate based on chemical-specific characteristics (e.g., degradation product with greater toxicity).

3.4.3 Elimination of Essential Elements: Calcium, Iron, Magnesium, Potassium, and Sodium

In accordance with RAGS Part A, essential elements that are potentially toxic only at extremely high concentrations may be eliminated as COPCs in a risk assessment. Specifically, an essential nutrient may be screened out if it is present at concentrations that are not associated with adverse health effects. Based on RAGS, the lack of risk-related data, and USEPA Region IV's recommendations, the following essential nutrients will not be included in HHRAs: calcium, iron, magnesium, potassium, and sodium.

Risk information usually obtained from the Integrated Risk Information System (IRIS) or Health Effects Assessment Summary Tables (HEAST) is necessary to calculate risk and hazard estimates (and risk-based screening values). This information is based on toxicological and epidemiological data which are critiqued and approved by the scientific and regulatory community (i.e., listed in IRIS and/or HEAST). Risk information (or surrogate risk information) is not always available for all CPSSs, so their risk and/or hazard will not be calculated. The results of the screening process will be tabulated in the HHRA. No risk-based screening values are available for TPH and chemical-specific analyses were performed on site samples, so exposure will not be quantified for this group of compounds. The most toxic TPH constituents would generally be included in the chemical-specific analyses.

3.4.4 Summary of COPCs

The results of the screening evaluations will be tabulated on a medium-specific basis in the site-specific HHRAs.

3.5 Estimation of Risk and Hazard

COPCs will be identified, and exposure will be estimated for these compounds. Risk/hazard will be subsequently calculated based on exposure estimates, then exposure scenarios (e.g., soil exposure during commercial land use) exceeding USEPA acceptable limits will be identified.

An exposure scenario of concern will be identified as a scenario with incremental excess lifetime cancer risk (ILCR) estimated greater than 1E-4 or a hazard index (HI) estimated greater than 1. In the next step, COPCs exceeding 1E-6 ILCR or a HQ greater than 0.1 in a scenario of concern are retained as COCs. Section 5, Toxicity Assessment, discusses cancer risk thresholds and noncancer toxicity in detail.

4 Exposure Assessment

This section of the HHRAs will determine the magnitude of contact that a potential receptor may have with site-related COPCs. Exposure assessment involves four stages:

- Characterizing the physical setting and land use of the site.
- Identifying COPC release and migration pathway(s).
- Identifying the potential receptors, under various land use or site condition scenarios, and the pathways through which they might be exposed.
- Quantifying the intake rates, or contact rates, of COPCs.

4.1 Exposure Setting and Land Use

The site setting and land use will be detailed or referenced in this section of the site-specific HHRAs. This information is used to develop appropriate exposure estimates for different land use assumptions. If the future use of the area in question is known, this information will be used to define exposure assumptions used when calculating risk (e.g., sites known to be commercially zoned will not be assessed for residential land use). Future land use will be specified with as much accuracy as possible in site-specific HHRAs, particularly for property being transferred from the Navy to the City of Millington.

4.2 Potentially Exposed Populations

This section will describe who may be exposed to contaminants in environmental media. The populations typically addressed will be one or a combination of the following: current site workers, hypothetical current site trespassers, as well as hypothetical future site residents. Because current site workers at most sites within NSA Memphis would be expected to have limited contact with contaminated media at most sites, worker-related exposure may be addressed exclusively for maximally exposed site workers, assuming the future worker scenario would be protective of both current and future site workers. Specifics will be discussed in this section of the site-specific HHRAs.

4.3 Exposure Pathways

This section will summarize how potential human receptors may be exposed to site media. In general, soil matrix-related pathways will include incidental ingestion and dermal contact. Ingestion and inhalation of volatilized contaminants will be typical groundwater exposure pathways. The hypothetical future scenarios will assume continuous, uniform exposure to current surface soil conditions and the use of site groundwater as a potable water source, unless otherwise noted in the site-specific HHRA. A table in the site-specific HHRA will justify and summarize exposure pathways and potential human receptors.

4.4 Exposure Point Concentrations

The EPC is the estimated concentration of a contaminant in an exposure medium that will be contacted by a real or hypothetical receptor. Determining the exposure point concentration depends on factors such as:

- Availability of data
- Amount of data available to perform statistical analysis
- Reference concentrations not attributed to site impacts
- Location of the potential receptor

USEPA Region IV guidance calls for assuming lognormal distributions for environmental data and the calculation of 95% UCL on the mean for use in exposure quantification. Applying the UCL is generally inappropriate with less than 10 samples. Therefore, the maximum concentrations detected will be used for all datasets with less than 10 samples. In general, outliers have been included when calculating the UCL because high values seldom appear as outliers for a lognormal distribution. Including outliers increases the overall uncertainty of the calculated risks and conservatively biases exposure estimates.

For sample sets of 10 and greater, the UCL will be calculated for a lognormal distribution as follows:

$$UCL = e^{\left(\bar{a}+0.5s_a^2 + \frac{H_{0.95}\ x\ s_a}{\sqrt{n-1}}\right)}$$

where:

$\bar{a}$	=	$\Sigma a/n$ = sample arithmetic mean of the log-transformed data, $a = \ln(x)$
s_a	=	sample standard deviation of the log-transformed data
n	=	number of samples in the data set
$H_{0.95}$	=	value for computing the one-sided upper 95% confidence limit on the lognormal mean from standard statistical tables (Gilbert, 1987)

EPCs and UCLs will be summarized and tabulated when applicable in the site-specific HHRA.

4.5 Quantification of Exposure

This section describes the models, equations, and intake model variables used to quantify doses or intakes of the COPCs for the surface soil and groundwater exposure pathways. The models are designed to estimate route- and medium-specific factors, which are multiplied by the EPC

to estimate chronic daily doses. The intake model variables generally reflect 50th or 95th percentile values which, when applied to the EPC, ensure that the estimated intakes represent the reasonable maximum exposure (RME, which is considered 95th percentile). Formulae are derived from RAGS, Part A unless otherwise indicated. Table 1 lists intake model variables used to compute chronic daily intake (CDI) for potential receptors exposed to surface soil and/or groundwater contaminants.

Because NSA Memphis is part of BRAC, future site use cannot be determined with any certainty. Therefore, the conservative assumptions will be used to account for any reasonable future use. Current reuse plans will be referenced and discussed in the site-specific HHRAs. NSA Memphis media analytical results and exposure methods have been formatted to allow exposure estimates to be fine-tuned based on actual conditions as base reuse plans materialize, and this information will be used on a site-specific basis, if known.

In accordance with USEPA's recommendations, the adult and child intake variables will be combined to estimate exposure to carcinogens. This factor is referred to as the lifetime weighted average, or LWA. The LWA considers the difference in daily ingestion rates for soil and drinking water, body weights, and exposure durations for children (ages 1 to 6) and adults (ages 7 to 31). The exposure frequency is assumed to be identical for the adult and child exposure groups, and an example is shown after the equations are presented below.

Before quantifying soil exposure, it will first be necessary to derive the appropriate fraction ingested (or contacted) (FI/FC) from contaminated area factors for each applicable COPC. These factors will be derived by evaluating the spatial distribution of COPCs. The FI/FC will be computed by estimating the maximum area affected and dividing it by the total exposure unit area. These computations will be performed conservatively to account for uncertainty associated with contaminant distributions.

Table 1
Parameters Used to Estimate CDI

Pathway Parameters	Resident Adult	Resident Child	Adult Worker	Trespassing Child (age 7-16)	Units
Surface Soil Ingestion and Dermal Contact					
Ingestion Rate (soil)	100[a]	200[a]	50[a]	100[a]	mg/day
Ingestion Rate (water)	2	1	1	NA	L/day
Exposure Frequency	350[b]	350[b]	250[b]	52[f]	days/year
Exposure Duration	24[c]	6[c]	25[c]	10[g]	years
Dermal Contact Area	4,100[a]	2,900[a]	4,100[a]	4,100[a]	cm^2
Skin Adherence Factor	1	1	1	1	mg/cm^2
Absorption Factor	0.01 (organics) 0.001 (inorganics)	0.01 (organics) 0.001 (inorganics)	0.01 (organics) 0.001 (inorganics)	0.01 (organics) 0.001 (inorganics)	unitless
Oral Absorption Efficiency	0.8 (VOCs) 0.5 (other organic compounds) 0.2 (inorganics)	0.8 (VOCs) 0.5 (other organic compounds) 0.2 (inorganics)	0.8 (VOCs) 0.5 (other organic compounds) 0.2 (inorganics)	0.8 (VOCs) 0.5 (other organic compounds) 0.2 (inorganics)	unitless
Conversion Factor	1E-6	1E-6	1E-6	1E-6	kg/mg
Body Weight	70[a]	15[a]	70[a]	45[a]	kg
Averaging Time, Noncancer	8,760[d]	2,190[d]	9,125[d]	3,650[d]	days
Averaging Time, Cancer	25,550[e]	25,550[e]	25,550[e]	25,550[e]	days

Notes:

a — USEPA (1989a) *Risk Assessment Guidance for Superfund Vol. I, Human Health Evaluation Manual (Part A).*

b — USEPA (1991b) *Risk Assessment Guidance for Superfund Vol. I: Human Health Evaluation Manual Supplemental Guidance, Standard Default Exposure Factors, Interim Final*, OSWER Directive: 9285.6-03.EPA/600/8-89/043.

c — USEPA (1991a), *Risk Assessment Guidance for Superfund: Vol. I — Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals)*, OSWER Directive 9285.7-01B.

d — Calculated as the product of ED (years) x 365 days/year.

e — Calculated as the product of 70 years (assumed lifetime) x 365 days per year.

f — Assuming one day per week exposure.

g — Assuming trespassing occurs during the 10-year adolescent/teenage period.

NA — Not applicable.

The FI/FC factors modify the concentrations to more closely approximate site-wide exposure conditions for a given exposure unit area. When the UCL is used as EPC, no FI/FC adjustments will be made. In addition, CPSSs not eliminated from the HHRAs based on the screening comparisons described in Section 3.4 may be eliminated as a COPC because the UCL concentration does not exceed the corresponding background concentration or RBC. This will be discussed on a site-specific basis.

4.5.1 Surface Soil Pathway Exposure

Ingestion of COPCs in Surface Soil

Except CDI for a site resident's exposure to carcinogens, the following equation is used to estimate the ingestion of COPCs in soil:

$$CDI_s = (EPC_s)(IR)(EF)(ED)(F)(FI)/(BW)(AT)$$

where:

CDI_s	=	ingested dose (mg/kg-day)
EPC_s	=	exposure point concentration of contaminant in soil (mg/kg)
IR	=	ingestion rate (milligrams per day [mg/day])
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
F	=	conversion factor (1E-6 kg/mg)
FI	=	fraction ingested from contaminated source (unitless)
BW	=	body weight (kg)
AT	=	averaging time (days)

The LWA is used to calculate carcinogenic CDI for site residents. An example of the LWA calculation is shown below for the soil ingestion pathway, and LWAs are similarly calculated for subsequent equations.

$$LWA = [(IR_a \times ED_a)/BW_a] + [(IR_c \times ED_c)/BW_c]$$

where:

LWA	=	lifetime weighted average
IR	=	ingestion rate (milligrams per day [mg/day])
ED	=	exposure duration (years)
BW	=	body weight (kg)
$_a$	=	adult
$_c$	=	child

Consequently, CDI for carcinogens would be calculated as follows for site residents:

$$CDI_s = (EPC_s)(EF)(LWA)(F)(FI)/(AT)$$

where:

CDI_s = ingested dose (mg/kg-day)

EPC_s = exposure point concentration of contaminant in soil (mg/kg)

EF = exposure frequency (days/year)

F = conversion factor (1E-6 kg/mg)

FI = fraction ingested from contaminated source (unitless)

AT = averaging time (days)

LWA = lifetime weighted average

Dermal Contact with COPCs in Surface Soil

The following equation is used to estimate intake due to dermal contact with COPCs in soil:

$$CDI_{sd} = (EPC_s)(CF)(EF)(ED)(F)(FC)(ABS)(AF)/(BW)(AT)$$

where:

CDI_{sd} = dermal dose (mg/kg-day)

EPC_s = exposure point concentration of contaminant in soil (mg/kg)

CF = contact factor (cm^2)

EF = exposure frequency (days/year)

ED = exposure duration (years)

F = conversion factor (1E-6 kg/mg)

FC = fraction contacted from contaminated source (unitless)

ABS = absorption factor (unitless value, specific to organic versus inorganic compounds)

AF = adherence factor (milligrams per square centimeter [mg/cm^2])

BW = body weight (kg)

AT = averaging time (days)

4.5.2 Groundwater Pathway Exposure

Ingestion and Inhalation of COPCs in Groundwater

The following equation is used to estimate the ingestion and/or inhalation of COPCs in groundwater:

$$CDI_w = (EPC_w)(IR)(EF)(ED)(FI)/(BW)(AT)$$

where:

CDI_w = ingested/inhaled dose (mg/kg-day)

EPC_w = exposure point concentration of contaminant in water (milligrams per liter [mg/L])

IR = ingestion rate (L/day)

EF = exposure frequency (days/year)

ED = exposure duration (years)

FI = fraction ingested from contaminated source (unitless)

BW = body weight (kg)

AT = averaging time (days)

HHRAs are comprised of many tables, and intake tables serve only as an intermediate check when reviewing the document. The CDI equations above can be solved assuming a concentration of 1, and the result can be used as a universal multiplier. Multipliers were developed for each typical land use scenario and are shown in Table 2. Consequently, a significant number of the tables in HHRAs can be eliminated. An example of the abbreviated CDI method is shown below:

$$CDI = (EPC)(M)$$

where:

CDI = chronic daily intake (mg/kg-day)

EPC = exposure point concentration (mg/kg or mg/L)

M = multiplier specific to the exposure scenario, land use, and potential receptor selected

Table 2

Multipliers[a] Used to Estimate Chronic Daily Intake

		Soil		Groundwater
		Ingestion	*Dermal Contact*	*Ingestion*
Exposure Scenario	**Exposure Type**	**All Chemicals**	**Organics[b]**	**All Chemicals[c]**
Resident	Noncarcinogens (adult)	1.37E-6	5.62E-7	2.74E-2
	Noncarcinogens (child)	1.28E-5	1.85E-6	6.39E-2
	Carcinogens (LWA)	1.57E-6	3.51E-7	1.49E-2
Trespasser	Noncarcinogens	3.17E-7	1.30E-7	NA
(age 7-16)	Carcinogens	4.52E-8	1.85E-8	NA
Site Worker	Noncarcinogens	4.89E-7	4.01E-7	9.78E-3
	Carcinogens	1.75E-7	1.43E-7	3.49E-3

Notes:
NA — Not applicable
LWA — Lifetime weighted average
[a] — The product of the multiplier and the exposure point concentration equals the chronic daily intake for a given chemical assuming a reasonable maximal exposure scenario.
[b] — The multiplier for inorganics is multiplied by a factor of 0.1 to account for the dermal absorption factor of 0.001 for inorganics; the multiplier for organic compounds includes the 0.01 factor.
[c] — The ingestion intake is also used to address inhalation risk in accordance with USEPA's Supplemental Guidance To RAGS Bulletin 3; ingestion risk is approximately equal to risk posed by dermal and inhalation exposure while showering, and this is applied to volatile organic compounds only.

Because multipliers can be reviewed separately, CDI will be incorporated into the risk and hazard equations and *will not be presented* in separate tables.

5 Toxicity Assessment

5.1 Carcinogenicity and Noncancer Effects

USEPA has established a classification system for rating the potential carcinogenicity of environmental contaminants based on the weight of scientific evidence. The cancer classes are described below. Cancer weight-of-evidence class "A" (human carcinogens) means that human toxicological data have shown a proven correlation between exposure and the onset of cancer (in varying forms). The "B1" classification indicates some human exposure studies have implicated the compound as a probable carcinogen. Weight-of-evidence class "B2" indicates a possible human carcinogen based on confirmatory carcinogenic laboratory animal data. Weight-of-evidence class "C" identifies possible human carcinogens, and class "D" indicates a compound not classifiable with respect to its carcinogenic potential. A class "A" compound posing risk higher than USEPA's acceptable risk range has more weight than would a class "C" compound. There is more uncertainty in the lower classifications, so the weight-of-evidence should be used by risk managers when making risk management decisions based on cancer risk.

USEPA has established slope factors (SF) for carcinogenic compounds. The SF is defined as a "plausible upper-bound estimate of the probability of a response (cancer) per unit intake of a chemical over a lifetime" (RAGS, Part A). Upper-bound estimates are more likely to overestimate cancer potential.

In addition to potential carcinogenic effects, most substances also can produce other toxic responses at doses greater than experimentally derived threshold concentrations. USEPA has derived reference dose (RfD) values for these substances. A chronic RfD is defined as, "an estimate (with uncertainty spanning perhaps an order of magnitude or greater) of a daily exposure concentration for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects during a lifetime." These

toxicological values are used in risk formulae to assess the upper-bound level of cancer risk and noncancer hazard associated with exposure to a given chemical concentration.

For carcinogens, the potential risk posed by a chemical is computed by multiplying the CDI (as mg/kg-day) by the SF (in reciprocal mg/kg-day). The HQ (for noncarcinogens) is computed by dividing the CDI by the RfD. USEPA has set standard limits (or points of departure) for carcinogens and noncarcinogens to evaluate whether significant risk is posed by a chemical (or combination of chemicals). For carcinogens, the point-of-departure range is 1E-6, with a generally accepted range of 1E-6 to 1E-4. These risk values correlate with one in 10,000 (1E-4) and one in 1 million (1E-6) excess cancer incidence resulting from exposure to toxic compounds from outside the body.

For noncarcinogens, other toxic effects are generally considered possible if the HQ (or sum of HQs for a pathway-hazard index) exceeds the threshold value of 1. Although both cancer risk and noncancer hazard are generally additive only if the target organ is common to multiple chemicals, a most conservative estimate of each may be obtained by summing the individual risks or hazards, regardless of target organ. Site-specific HHRAs for NSA Memphis will take the universal summation approach for each class of toxicant. Details regarding the risk formulae applied to site data are provided in Section 6, Risk Characterization.

Critical studies used in establishing toxicity classifications by USEPA are shown in the IRIS database, which is the primary source for information necessary to estimate risk. HEAST, Fiscal Year 1995 is the secondary source for this information. In addition, USEPA's National Center for Environmental Assessment (NCEA) will be used as a source when necessary. In accordance with RAGS, a table will summarize toxicological data in the site-specific HHRAs in the form of RfDs and SFs obtained for COPCs identified in site media, as well uncertainty/modifying factors, target organs, and cancer classes (where available).

5.2 Evaluating Dermal Exposure and the Resulting Toxicity

In accordance with USEPA Region IV's *Supplemental Guidance to RAGS Bulletin 2*, dermal RfD values and SFs are derived from the corresponding oral values. As described in the supplemental guidance, the oral RfD is multiplied by an oral absorption efficiency factor (OAF), expressed as a decimal. The resulting dermal RfD is based on the absorbed dose. The RfD based on absorbed dose is the appropriate value with which to compare a dermal dose, because dermal doses are expressed as absorbed rather than administered (intake) doses. For the same reasons, a dermal SF is derived by dividing the oral SF by the OAF. The oral SF is divided rather than multiplied because SFs are expressed as reciprocal doses.

Appendix A of RAGS, Part A states that in the absence of specific data, an assumption of 5% oral absorption would be relatively conservative. *Supplemental Guidance to RAGS: Region IV Bulletin 2* indicates that in the absence of specific data, USEPA Region IV suggests an oral absorption factor of 80% for volatile organics, 50% for semivolatile organics, and 20% for inorganic chemicals. These percentages (or associated fractions) will be used in the site-specific HHRAs

5.3 Toxicity Profiles for COPCs

In accordance with RAGS, toxicological summary paragraphs will be included in the body of the HHRA text for all COPCs. Most information for the profiles will be gleaned from IRIS and HEAST. Another source of information will be NCEA. Any additional references will be noted specifically in the text. The profiles will summarize adverse effects of COPCs and the amount associated with such effects.

6 Risk Characterization

Risk characterization combines the exposure assessment and toxicity assessment results to yield qualitative and quantitative expressions of risk and/or hazard for the exposed receptors. The quantitative component expresses the probability of developing cancer, or a threshold comparison of the estimated dose with a reference dose for noncancer effects. These quantitative estimates

are developed for individual chemicals, exposure pathways, transfer media, and source media, and for each receptor for all media to which one may be exposed. The qualitative component usually involves comparing COC concentrations in media with established criteria or standards for chemicals for which there are no corresponding toxicity values. The risk characterization helps guide risk-management decisions.

Generally, the risk characterization will follow the methodology prescribed by RAGS Part A, as modified by more recent information and supplemental guidance cited in the earlier sections of this memorandum. *The USEPA methods are designed to be health-protective and tend to overestimate risk rather than underestimate it. The risk results, therefore, are generally overly conservative, because risk characterization involves summing the overestimated risk estimates.*

6.1 Risk Characterization Methodology

Potential excess risks to humans following exposure to COPCs will be estimated using methods established by USEPA, when available. As discussed above, these methods are health-protective and are likely to overestimate risk. Risks from hazardous chemicals are calculated for either carcinogenic or noncarcinogenic effects. Some carcinogenic chemicals may also pose a noncarcinogenic hazard. The potential human health effects associated with chemicals that produce carcinogenic and other toxic effects will be characterized separately, as discussed below.

6.1.1 Carcinogenic Effects of Chemicals

The risk attributed to exposure to carcinogens is estimated as the probability of an individual developing cancer over a lifetime as a result of exposure to a potential carcinogen. In the low-dose range, which would be expected for most environmental exposures, cancer risk is estimated from the following linear equation (EPA, 1989a):

$$ILCR = (CDI)(SF)$$

where:

ILCR	=	incremental lifetime excess cancer risk, a unitless expression of the probability of developing cancer, adjusted for reference incidence
CDI	=	chronic daily intake, averaged over 70 years (mg/kg-day)
SF	=	cancer slope factor $(mg/kg\text{-}day)^{-1}$

For a given pathway with simultaneous exposure of a receptor to several carcinogens, the following equation is used to sum cancer risks:

$$Risk_p = ILCR(chem_1) + ILCR(chem_2) + \ldots ILCR(chem_i)$$

where:

$Risk_p$	=	total pathway risk of cancer incidence
$ILCR(chem_i)$	=	incremental lifetime excess cancer risk for a specific chemical

Cancer risk for a given receptor across pathways and across media is summed in the same manner.

6.1.2 Noncarcinogenic Effects of Chemicals

The risks associated with the noncarcinogenic effects of chemicals are evaluated by comparing an exposure level or intake with a reference dose. The HQ, defined as the ratio of intake to RfD, is defined as (RAGS, Part A):

$$HQ = CDI/RfD$$

where:

HQ	=	hazard quotient (unitless)
CDI	=	intake of chemical (mg/kg-day)
RfD	=	reference dose (mg/kg-day)

Chemical noncarcinogenic effects are evaluated on a chronic basis, using chronic RFD values. An HQ of 1 indicates that the estimated intake equals the RfD. If the HQ is greater than unity, there may be a concern for potential adverse health effects.

In the case of simultaneous exposure of a receptor to several chemicals, an HI will be calculated as the sum of the HQs by:

$$HI = HQ_1 + HQ_2 + \ldots HQ_i$$

where:

HI	=	Hazard Index (unitless)
HQ	=	Hazard Quotient (unitless)

Risk and hazard projections will be summarized in tabular format on a medium- and exposure pathway-specific basis in the HHRAs.

6.2 Surface Soil Pathways

Generally, the incidental ingestion and dermal contact pathways will be characterized for surface soil. Surface soil onsite will be evaluated under scenarios and exposure pathways outlined in the site-specific HHRAs.

6.3 Groundwater Pathways

Groundwater pathways will typically consist of ingestion and inhalation of volatilized chemicals in groundwater. The site-specific HHRAs will detail the pathways which will be addressed. Most groundwater pathways are not complete because municipal water supplies are used, and this will be discussed in the HHRAs.

6.4 COCs Identified

COCs will be identified based on cumulative (all pathway) risk and hazard projected for the sites. USEPA has established a generally acceptable risk range of 1E-4 to 1E-6, and an HI threshold of 1.0. Any COPC that is carried through the risk assessment process and found to contribute to a scenario with an ILCR in excess of 1E-4 or HI greater than 1 for any of the exposure scenarios evaluated in this risk assessment, and has an individual exposure pathway risk greater than 1E-6 or exposure pathway HQ greater than 0.1, will be referred to as a COC. A table will present the COCs identified in site-specific HHRAs.

7 Risk Uncertainty

This section will discuss the uncertainty and variability inherent in the risk assessment process in addition to site-, medium-, and exposure pathway-specific influences. Overall, uncertainties associated with the initial stages of the risk assessment process become magnified when they are combined with other uncertainties. It is not possible to eliminate all uncertainties; however, recognizing the uncertainties is fundamental to understanding and subsequently using risk assessment results.

Where chronic RME estimates of risk/hazard indicated a significant threat (e.g., ILCR greater than 1E-4) would be posed to human health, central tendency (CT) analysis may be performed. RME estimates are based on the upper bound (90th or 95th percentile) exposure assumptions, while CT estimates are based on the 50th percentile (mean or median) values. CT exposure scenarios are constructed consistent with standard CT exposure assumptions provided in *Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure-Draft* (USEPA, November 1993). CT exposure assumptions will be presented in the site-specific HHRAs, when applicable.

8 Risk Summary

Risk estimates will be presented and summarized in table form in the site-specific HHRAs.

9 Remedial Goal Options

RGOs are chemical concentrations computed to equate with specific risk and/or hazard goals that may be established for a particular site. As previously discussed, COCs are identified as any COPC that significantly contributes to a scenario of concern. RGOs will be calculated for each land use scenario with cumulative risk estimates greater than 1E-4 or cumulative hazard indices greater than 1.0. Based on this method, COCs may be identified, requiring RGO calculation. Inclusion in the RGO table does not necessarily indicate that remedial action will be required to address a specific chemical. Instead, RGOs are provided to facilitate risk-management decisions.

In accordance with USEPA Supplemental RGO Guidance, RGOs will be calculated at 1E-4, 1E-5, and 1E-6 risk levels for carcinogenic COCs and HI goals of 3, 1, and 0.1 for noncarcinogenic COCs. RGOs will be based on specific scenarios which will be identified in the site-specific HHRAs.