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FINAL GRAY AREA INVESTIGATION REPORT MILLINGTON SUPPACT TN
6/16/1995
ENSAFE ALLEN AND HOSHALL

FINAL GRAY AREA INVESTIGATION REPORT
NAVAL AIR STATION MEMPHIS
MILLINGTON, TENNESSEE

CTO-94
Contract No. N62467-89-D-0318

Prepared for:

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

Prepared by:

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5720 Summer Trees Drive, Suite 8
Memphis, Tennessee 38134
(901) 383-9115

June 16, 1995

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1.0 INTRODUCTION

NAS Memphis is scheduled for partial closure and realignment as a result of the Defense Base Closure and Realignment Act of 1990 (BRAC). In preparation for transferring the closing portion of the base to the public, a fence-to-fence environmental baseline survey (EBS) was conducted at NAS Memphis to evaluate the environmental condition of the property. The survey took place between September 1993 and February 1994.

In May 1994, the Draft EBS summary report was submitted to Southern Division (SOUTHDIV), Naval Facilities Engineering Command. During the EBS, each facility at NAS Memphis was surveyed via physical walk-throughs and a records search to determine its potential for a release of hazardous materials, hazardous waste, and/or petroleum products to the environment. In the context of the EBS, *facility* means an individual building, site, solid waste management unit, parcel of land, etc., rather than the entire base. Based on its past and current potential for a release, each facility was then assigned one of seven possible classifications (using a number/color system) indicating its suitability for transfer. Classifications 1 through 4 are considered transferrable and classifications 5 through 7 non-transferrable. The EBS identified several facilities at NAS Memphis as needing "further evaluation," and therefore classified them as "7/gray."

The 7/gray classification was assigned based on at least one of the following factors:

- Insufficient information
- Current uses of the facility
- Past uses of the facility
- Presence of aboveground or underground storage tanks
- Potential for impact from adjacent facilities

Objectives and Scope

The objective of this investigation was to verify whether a contaminant release has occurred due to past disposal practices or operations associated with the subject facility. The facilities addressed in this investigation are on the portion of the base that is scheduled to be turned over or transferred by the Navy as part of the partial closure of NAS Memphis (see Figure 1-1). The results of this investigation have provided the necessary data to determine if the facilities can be reclassified as transferrable or if further investigation or remedial action is needed. Table 1-1 shows the name and a brief description of each area included in this investigation.

The subject facilities are subdivided into either the Installation Restoration Program (IRP) or the Underground Storage Tank (UST) program. This investigation did not address facilities that will be investigated under the Navy's UST program, nor does it address those classified as 7/gray due to potential contaminant migration from adjacent sites. The status of these facilities will be determined when the adjacent site is addressed under the appropriate program.

Table 1-1
BRAC Gray Area Facilities

Facility Number	Program	Description
N-122	IRP	Acetylene General Building
N-4	IRP	Transient Aircraft Operations Facility
761	IRP	Lake House assoc. w/Navy Lake, Lake Louise, and Tanya Lake
OL-006	IRP	Open Land Area assoc. w/Runways including Arresting Gear (1559), Turkey Shoot Area, Runway Take-off/Approach Areas, and Gasoline Pits
N-7	IRP	Hangar assoc. w/Catapult and Landing Gear Operations
OL-003	IRP	Open Land Area assoc. w/the MWR Ponds and MWR Shooting Range

Table 1-1
BRAC Gray Area Facilities

Facility Number	Program	Description
N-1	UST	Office of Naval Air Training Administration
339	UST	Tank Farm (UST 336 and 337)
374	UST	AST at Former Flying Club and Current Aircraft Salvage Training School

Notes:

IRP — Installation Restoration Program
UST — Underground Storage Tank Program

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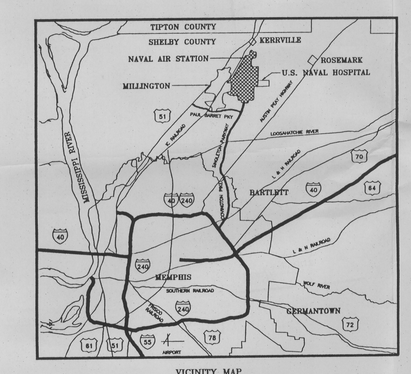

SOURCE: U.S. NAVY

GRAY AREA
INVESTIGATION REPORT
NAS MEMPHIS
MILLINGTON, TN.

FIGURE 1-1
GRAY AREA SITE LOCATION MAP
NAS MEMPHIS

Dr by: C. CASSELL	Tr by: E. ROGERS	
Ck by: R. SMITH	App by: E/AH	Sheet 1
Date: 06/14/95	DWG Name: 94GASLM1	Of 1

LEGEND

52 SWMU NO.

880 CONTOURS (4' INTERVAL)

RIDING TRAILS

600 0 600
SCALE FEET

SOURCE: U.S. NAVY

ASSEMBLY D CSI REPORT
NSA MEMPHIS
MILLINGTON, TN.

ATTACHMENT 3
LAND SURFACE ELEVATION MAP
NORTHSIDE OF NAS MEMPHIS

Dr by: E/AH	Tr by: E/AH	
Ck by: A. CHOATE	App by: E/AH	Sheet 1
Date: 05/08/96	DWG Name: 94LSEMNS	Of 1

2.0 SOIL INVESTIGATION SUMMARY

The investigatory approach was to collect and analyze biased surface soil samples from areas that would indicate a release of hazardous materials to the environment. Sample locations were selected based on facility design/layout, facility use, and visual observations. Typically, sample locations were selected in areas around doorways, low lying areas, confluences of streams, runoff points into lakes, etc. Sampling rationale for each site is described in the appropriate sections.

Data generated during the field investigation have been compared to the risk-based concentrations listed in the Risk-Based Concentration (RBC) Table (USEPA Region III, Third Quarter, 1994). The RBC concentrations are used in this investigation as a guideline to determine if further assessment of a site is warranted. These concentrations are generated by USEPA Region III toxicologists for a single contaminant under standard default exposure assumptions and are not intended to be used as regulations or as a substitute for a site-specific risk assessment. The referenced edition of the RBC tables is included as Appendix A.

Soil was sampled in accordance with the *Comprehensive RFI Work Plan* (E/A&H, 1994). A table summarizing the pertinent data generated during the investigation is provided in each section. The data validation process and the qualifiers presented in each table are explained in Section 3 and Appendix B. A full analytical data summary is provided in Appendix C, while the "hits only" are summarized in Appendix D.

2.1 Facility N-122

2.1.1 Site Description

This 4,000-square-foot building was constructed on Funafuti Street in 1950 on a concrete slab floor with brick and sheet metal walls (see Figure 2-1). According to the Structure Identification on a 1953 NAS Memphis map, Facility N-122 was an "acetylene general building" and has been identified through interviews as a welding shop. Currently, Facility N-122 is used for office space and storage of office supplies and armory equipment by the Naval Air Reserves (NAR).

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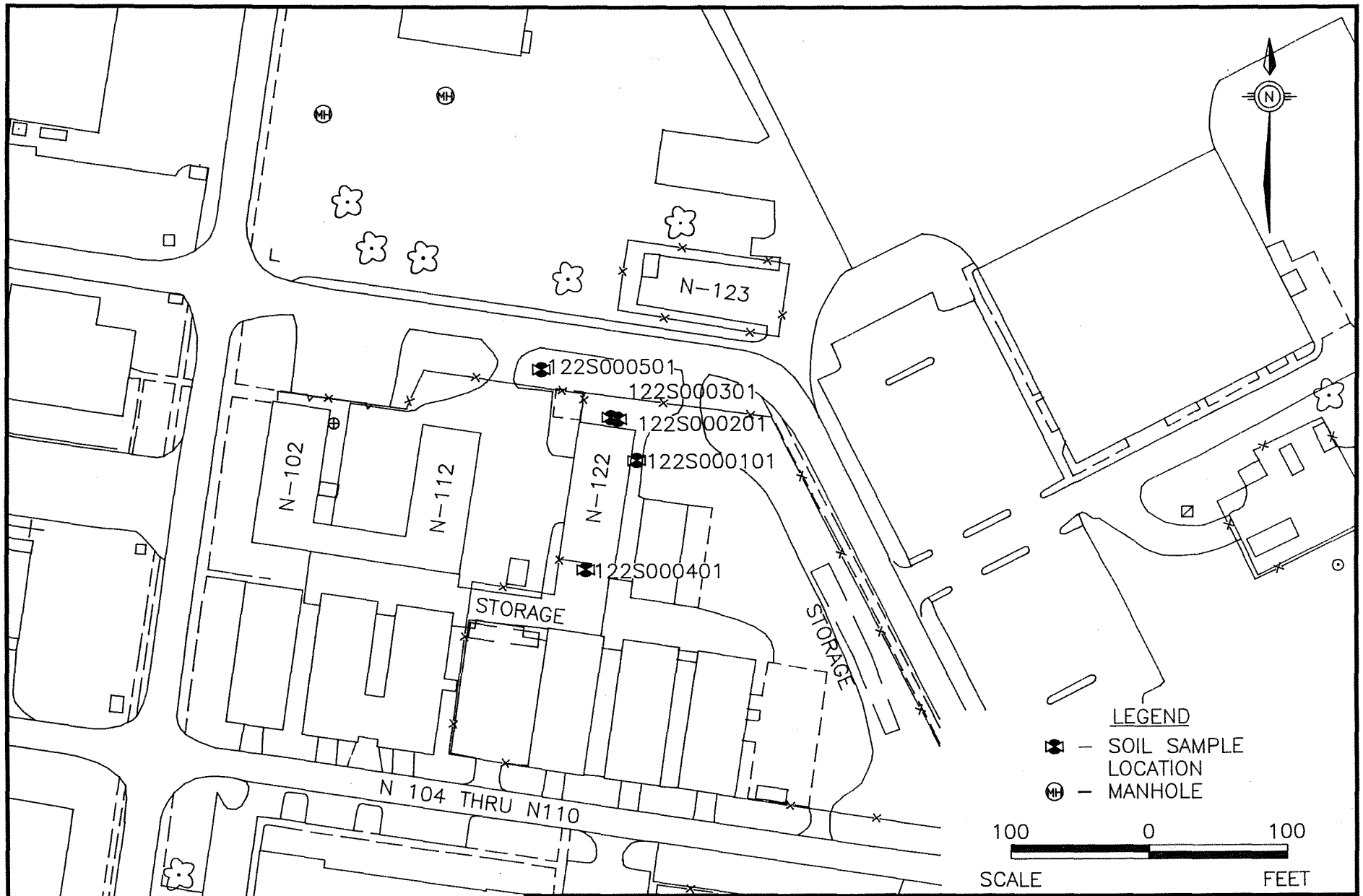

GRAY AREA
INVESTIGATION REPORT
NAS MEMPHIS
MILLINGTON, TN.

FIGURE 2-1
FACILITY N-122
SAMPLE LOCATION MAP

DWG DATE: 06/14/95 | DWG NAME: 94FN1221

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2.1.2 Sampling Rationale

The sampling rationale at Facility N-122 was to determine if materials generated had been improperly disposed of in or around the building. Five sample locations were selected at points where waste material generated during normal daily operations could have been dumped or poured. The areas selected were adjacent to the side door on the east side of the building (MEM/122S000101), around the northernmost doorway (MEM/122S000201 and MEM/122S000301), a low-lying area on the south end of the building (MEM/122S000401), and the drainage ditch north of the facility (MEM/122S000501). Samples were collected from the 0- to 12-inch interval using a stainless-steel hand auger. Analytical parameters for this sampling event included volatile organic compounds (VOCs), semivolatile organic compounds, metals, and total petroleum hydrocarbons (TPH). These parameters were selected to indicate if solvents, paint waste, or welding material (i.e., flux, solder, etc.) had been release in this area. Figure 2-1 shows the site layout and sample locations.

2.1.3 Findings and Conclusions

The analytical data indicate a release in an isolated area around Facility N-122. Elevated concentrations of VOCs, SVOCs, metals, and TPH were found in surficial soil within a low-lying area south of the building (Sample I.D. - MEM/122-S-0004-01). The types of contaminants and the location of the hits indicate a petroleum release and possible dumping of waste solvents/degreasers in this area. Elevated concentrations of other constituents were also found in the sediment sample from the ditch, as well as next to the double doors north of Facility N-122, but at considerably lower concentrations. Table 2-1 summarizes the organic constituents data and Table 2-2 summarizes the inorganics (metals) data.

Table 2-1
Building N-122 Soil Samples
Organic Data Summary

Parameter (µg/kg)	Sample I.D.					RBC Concentrations	
	MEM/122-S-0001-01	MEM/122-S-0002-01	MEM/122-S-0003-01	MEM/122-S-0004-01	MEM/122-S-0005-01	Residential (Soil)	Industrial (Soil)
Acenaphthene	ND	ND	ND	120 J	ND	4,700,000	61,000,000
Dibenzofuran	ND	ND	ND	53 J	ND	2,300,000	31,000,000
Fluorene	ND	ND	ND	130 J	ND	3,100,000	41,000,000
Phenanthrene	51 J	ND	ND	2400	ND	2,300,000	31,000,000
Anthracene	ND	ND	ND	660	ND	23,000,000	310,000,000
Carbazole	ND	ND	ND	470	ND	32,000	140,000
Di-n-butylphthalate	ND	ND	ND	56 BJ	40 BJ	7,800,000	100,000,000
Fluoranthene	170 J	ND	ND	4100 E	110 J	3,100,000	41,000,000
Pyrene	150 J	ND	ND	3200	91 J	2,300,000	310,000,000
Butylbenzylphthalate	ND	ND	ND	68 J	ND	16,000,000	200,000,000
Benzo(a)anthracene	82 J	ND	ND	1900	47 J	880	3900
Chrysene	97 J	ND	ND	2300	59 J	88,000	390,000
bis(2-Ethylhexyl)phthalate (BEHP)	39 J	ND	ND	320	ND	46,000	200,000
Benzo(b)fluoranthene	78 J	ND	ND	2100	50 JY	880	3,900
Benzo(k)fluoranthene	74 JY	ND	ND	1600	43 J	8,800	39,000
Benzo(a)pyrene	79 J	ND	ND	2000	44 J	88	390
Indeno(1,2,3-cd)pyrene	51 J	ND	ND	990	ND	880	3,900
Dibenzo(a,h)anthracene	ND	ND	ND	350 JY	ND	88	390
Benzo(g,h,i)perylene	55 J	ND	ND	960	ND	2,300,000	31,000,000
Total Petroleum Hydrocarbons (TPH) (mg/kg)	ND	ND	ND	140	ND	—	—
Methylene Chloride	ND	ND	1 J	1 J	ND	85,000	380,000
1,1,1-Trichloroethane (TCA)	24	5 J	2 J	6 J	ND	7,000,000	92,000,000
Tetrachloroethene (PCE)	1 J	ND	ND	7 J	ND	12,000	55,000

Notes:

ND - None Detected (Below Practical Quantitation Limit)
\- - No Data Available
Data qualifiers are explained in Appendix B.

Table 2-2
Building N-122 Soil Samples
Inorganic Data Summary

Parameter (mg/kg)	Sample I.D.					RBC Concentrations	
	MEM/122-S-0001-01	MEM/122-S-0002-01	MEM/122-S-0003-01	MEM/122-S-0004-01	MEM/122-S-0005-01	Residential (Soil)	Industrial (Soil)
Antimony	ND	ND	ND	ND	ND	31	410
Arsenic	6.7	7.5	6.6	5.2	8.1	23	310
Barium	79.8	88.3	104	115	90.1	5,500	72,000
Beryllium	0.36 B	0.35 B	0.42 B	ND	0.46 B	0.15	0.67
Cadmium	ND	ND	ND	2.2	1.4	39	510
Chromium	13.2	9.7	14.5	17.6	15.7	—	—
Cobalt	6.6 B	6.9 B	7.6 B	3.9 B	7.4 B	4,700	61,000
Copper	16.4	15.8	16.7	29.6	21.8	2,900	38,000
Lead [1]	71.5	16.2	16.8 S	63.2	22.5 S	400	—
Mercury	ND	ND	ND	0.14	ND	23	310
Nickel	15.6	14.5	15.7	9.4 B	15.2	—	—
Selenium	0.55 BN	BDL	ND	ND	ND	390	5,100
Silver	0.85 B	ND	ND	ND	ND	390	5,100
Thallium	ND	ND	ND	ND	ND	—	—
Vanadium	17.4	17.7	25.4	14.4	27.3	550	7200
Zinc	76.7	63	74.1	244	115	23,000	310,000
Tin	13.5 B	6.5 B	12 B	7.8 B	7.2 B	47,000	610,000

Notes:

ND - None Detected (Below Practical Quantitation Limit)
1 - USEPA Guidance (OSWER Directive 9355.4-12)
\- - No Data Available
Data qualifiers are explained in Appendix B.

2.2 Facility N-4

2.2.1 Site Description

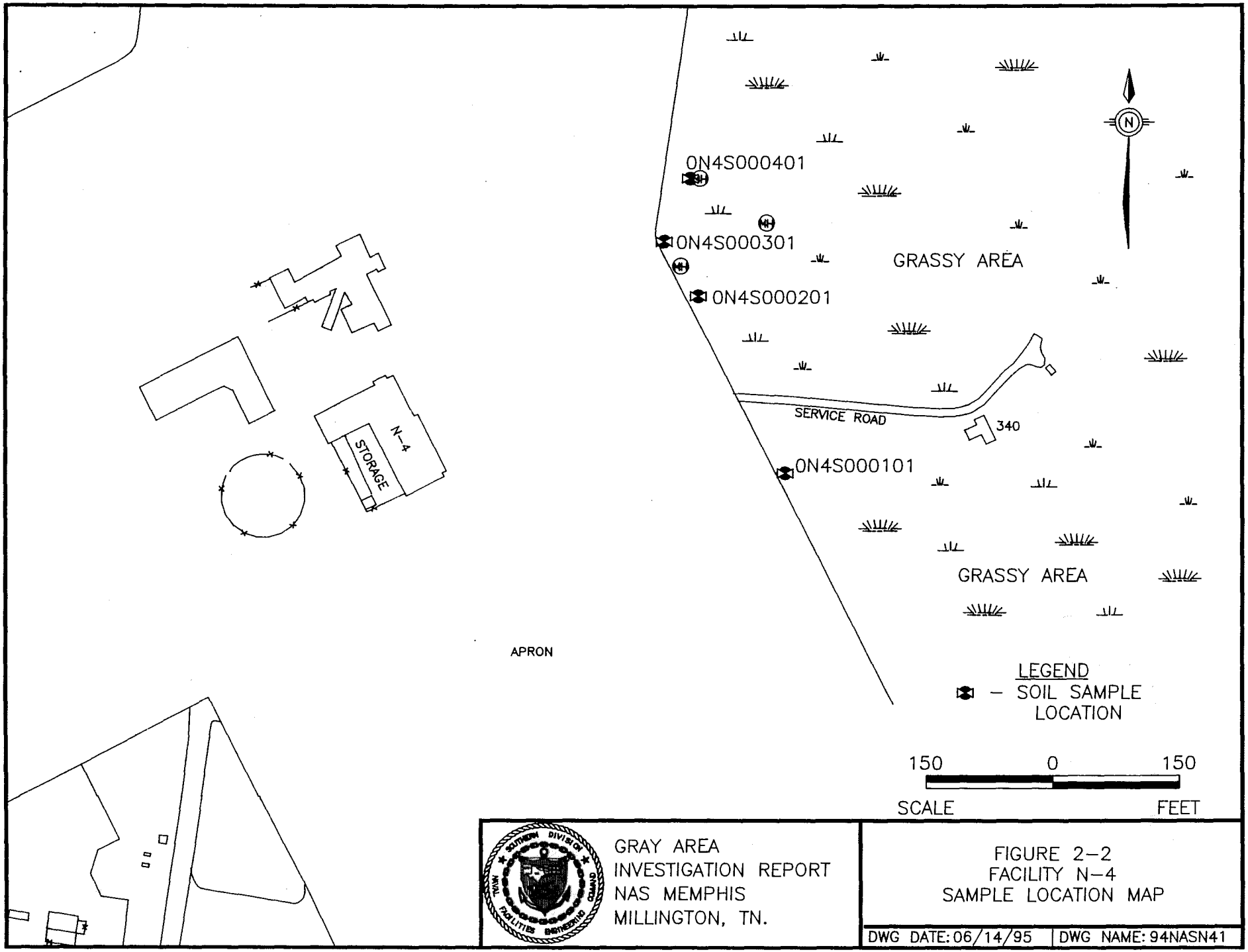
Facility N-4 is the transient aircraft operations facility adjacent to Facility N-2, which contains the air traffic control tower and air operations center (see Figure 2-2). The investigative area associated with Facility N-4 is located approximately 1000 feet east of the facility. Facility N-4 supports maintenance of transient aircraft at NAS Memphis such as refueling and passenger loading and unloading. These operations are the basis for the investigation in this area. The refueling of aircraft has reportedly resulted in fuel spills or releases to the surrounding area. In the past, fuel spilled during these operations was washed down the storm drains, but currently, all spilled fuel is contained using various absorbent materials. Past uses of the property have basically been the same due to its location on the runway apron, though Facility N-4 was used as a squadron administration building prior to being used as transient operations center. The area of investigation encompassed the grassy area adjacent to the runway apron.

2.2.2 Sampling Rationale

Surface soil samples were collected in runoff pathways at this site to determine if petroleum products have been released during refueling operations. Four samples were collected from the 0- to 12-inch interval in low-lying areas adjacent to the apron, and around a nearby stormwater catch basin located in the area (Figure 2-2). The samples were analyzed for TPH as an indicator of any past spills.

2.2.3 Findings and Conclusions

Low concentrations of petroleum constituents were detected in one soil sample (ON4-S-0002-01 @ 89 mg/kg TPH) collected in the Facility N-4 area (see Table 2-3). The sample was collected approximately 35 feet east-northeast of gas pit #21 (see Section 2.4.2). The surface soil sample collected in the vicinity of gas pit #21 during the investigation of the gas pits also exhibited elevated TPH levels (85 ppm) as discussed in Section 2.4.2.1. Gas pits #21 and #23 are located in the immediate vicinity of the Facility N-4 area. Soil samples collected from these pits from


0N4S000401
0N4S000301
0N4S000201
0N4S000101
GRASSY AREA
GRASSY AREA
SERVICE ROAD
340
N-4
STORAGE
APRON
N
LEGEND
– SOIL SAMPLE LOCATION
150 0 150
SCALE FEET
GRAY AREA
INVESTIGATION REPORT
NAS MEMPHIS
MILLINGTON, TN.
FIGURE 2-2
FACILITY N-4
SAMPLE LOCATION MAP
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DWG NAME: 94NASN41

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a depth of 10 feet below ground surface did not exhibit any evidence of petroleum contamination.

Table 2-3
Facility N-4 Data Summary

Parameters	Sample I.D.				Tennessee Total Petroleum Hydrocarbon Cleanup Levels
	MEM/ON4-S-0001-01	MEM/ON4-S-0002-01	MEM/ON4-S-0003-01	MEM/ON4-S-0004-01	10^{-4} to 10^{-6} cm/sec Soil Permeability
Total Petroleum Hydrocarbons (ppm)	ND	89	ND	ND	250-500[1]

Note:

1 Tennessee Soil Cleanup Levels for Drinking Water and Non-Drinking Water (mg/kg)

2.3 Facility 761 (Navy Lake Complex)

Facility 761, the lake house for the Navy Lake Complex, is between Navy Lake, Tanya Lake, and Lake Louise in the northern portion of the base (see Figure 2-3). These lakes were reportedly created during excavation associated with the construction of the NAS Memphis runways. Facility 761 is used as a central recreational and registration facility for the Navy Lake Complex. Currently, camping, fishing and picnicking occur on the grounds. This area was determined to need further assessment due to the potential for pesticide and herbicide accumulation in the sediments of the lakes. Each lake was approached as a separate site or area, to determine the effects, if any, of past weed/pest management practices. The overall sampling approach taken at this area was to sample the sediments at locations that receive runoff from the surrounding area and the points of discharge for any outfalls.

Samples were originally to be collected using a Ponar dredge; however, due to the large amount of detritus in the sediments, this methodology was ineffective and the original sample locations were relocated to the nearest point from which sediment samples could be collected from the

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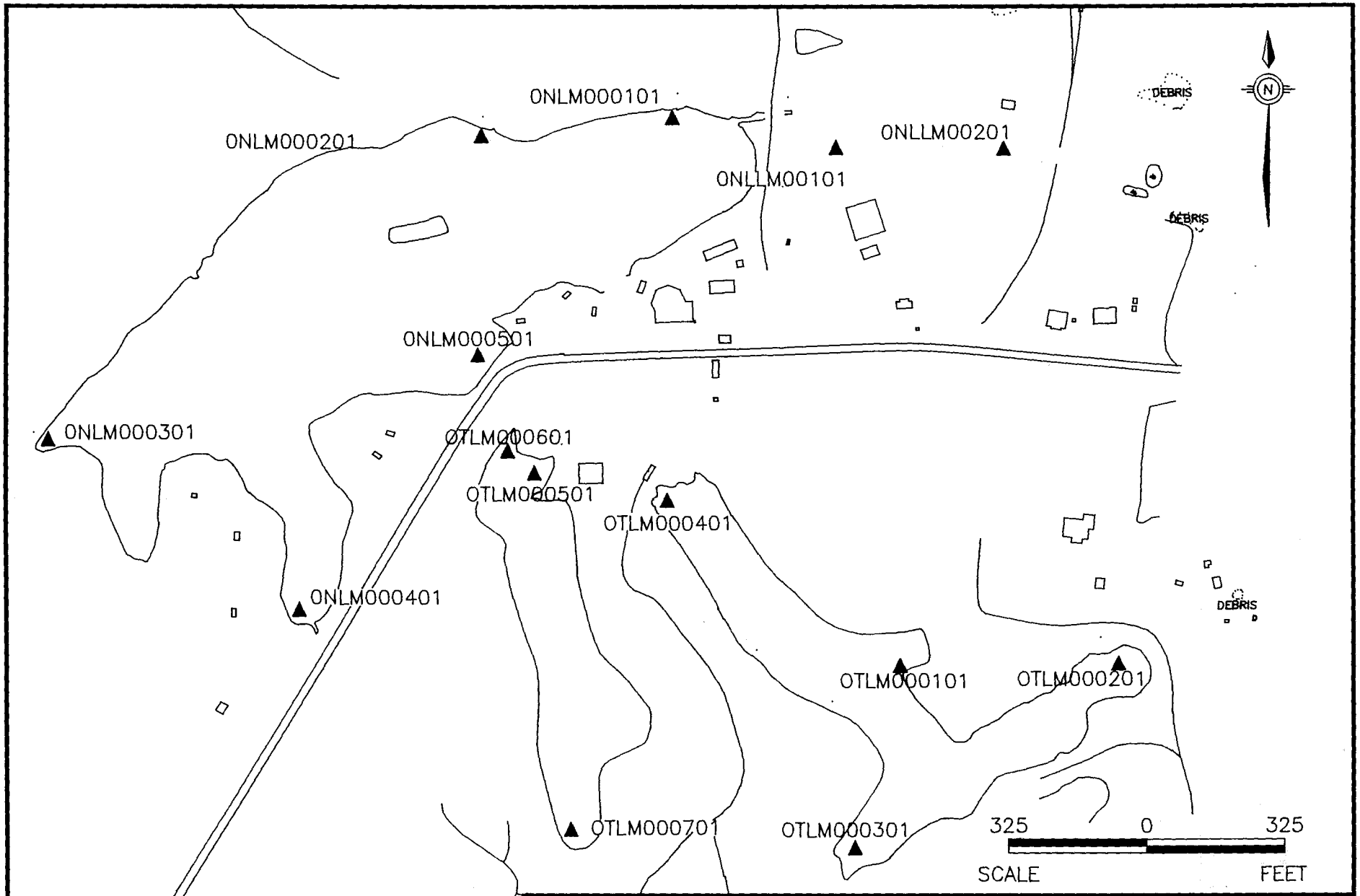

GRAY AREA
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MILLINGTON, TN.

FIGURE 2-3
FACILITY 761 (NAVY LAKE COMPLEX)
SAMPLE LOCATION MAP

DWG DATE: 06/14/95 | DWG NAME: 94NLCMX1

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lake bottom. In all instances, this meant collecting samples from the near-shore sediments, in obvious run-in points, where any overlying detritus could be removed and the underlying sediment made accessible. Samples of the near-shore sediments were collected using a stainless steel spoon.

Samples were analyzed for chlorinated pesticides, organophosphorus pesticides and herbicides to determine if runoff from the surrounding areas has resulting in accumulation of these materials in the lake sediments.

2.3.1 Navy Lake

2.3.1.1 Site Description

Navy Lake is the largest of the three lakes, covering approximately 5 acres, and is used for recreational purposes by Navy personnel. The lake is bordered on the northwest by heavily vegetated open land and sloping, open fields to the north and northeast. Lake Louise and Tanya Lake receive the overflow from this lake. Several outfalls, consisting of 4-inch diameter steel pipe, were noticed during the site survey. The origin of these outfalls was determined to be the open field areas to the north and northeast (Figure 2-3)

2.3.1.2 Sampling Rationale

Samples were collected from the lake to determine if pesticides or herbicides have accumulated in the sediments over the years. Samples were collected from two outfalls located along the northern bank (MEM/0NLM000101 and MEM/0NLM000201), a small inlet in the southwest portion of the lake (MEM/0NLM000301), a point of entry for runoff in the southern portion (MEM/0NLM000401), and the discharge point of a large culvert that drains to and/or from Tanya Lake (MEM/0NLM000501). Figure 2-3 shows the sample locations.

2.3.1.3 Findings and Conclusions

Analytical data generated during this investigation were below practical quantitation limits; therefore, do not indicate an accumulation of pesticides or herbicides in Navy Lake.

2.3.2 Tanya Lake

2.3.2.1 Site Description

Tanya Lake is divided into two separate sections, connected by a small ditch in the center. At the time of the field investigation, the ditch did not contain water (see Figure 2-3). However, vegetation in the ditch indicated aquatic conditions. It is assumed that this ditch contains water during high water conditions. Tanya Lake is used by Navy personnel for fishing and boating. One outfall to/from Navy Lake was noted in the northwest corner of the lake.

2.3.2.2 Sampling Rationale

Sediment samples were collected from the lake to determine if pesticides or herbicides have accumulated over the years. Samples were collected from the eastern portion of the lake along the northern bank (MEM/0TLM000101), a point of entry for runoff at the northernmost point (MEM/0TLM000201), a point of entry for runoff at the southernmost point (MEM/0TLM000301), and the eastern end of the connecting ditch (MEM/0TLM000401). Samples were collected from the western portion of the lake from the discharge point of the culvert connecting Navy Lake and Tanya Lake (MEM/0TLM000501), the western end of the connecting ditch (MEM/0TLM000601), and a point of entry for runoff in the southern portion of the lake (MEM/0TLM000701). Figure 2-3 shows the sample locations.

2.3.2.3 Findings and Conclusions

Analytical data generated during this investigation do not indicate an accumulation of pesticides or herbicides in Tanya Lake. One sample (MEM/OTL-M-0005-01) contained a low concentration of the organophosphorus pesticide, Merphos (cotton defoliant). The presence of

this pesticide is believed to be the result of normal weed/pest management practices. Table 2-4 shows the level detected and the associated RBC concentration.

Table 2-4
Tanya Lake Data Summary (OL-003)

Parameters	Sample I.D.	RBC Concentrations	
	MEM/OTL-M-0005-01	Residential	Industrial
Merphos (μg/kg)	12 J	2300	31000

2.3.3 Lake Louise

2.3.3.1 Site Description

Lake Louise, the smaller of the three lakes, appears to remain dry most of the year. A heavy growth of grasses, underbrush, and established hardwood trees were noted during the field investigation. A culvert in the western portion of the lake appears to drain into or out of Navy Lake. A small ditch was also noted in the eastern portion of the lake (see Figure 2-3).

2.3.3.2 Sampling Rationale

Soil samples were collected from the dry lake bottom to determine if pesticides or herbicides have accumulated over the years. Three samples were collected from the dry lake bed using a stainless-steel hand auger. Two samples were collected from the western portion of the lake bed (MEM/0LLM000101 and MEM/0LLM000201) at apparent runoff entry points and one sample from the small ditch in the eastern portion of the lake (MEM/0LLM000301). Figure 2-3 shows the sample locations.

2.3.3.3 Findings and Conclusions

Analytical results indicate low concentrations of both insecticides (dieldrin) and herbicides (2,4,5-TP) in the soil/sediment at Lake Louise (Table 2-5). The Risk-Based Concentrations from the USEPA RBC Table (Third Qtr. 1994) are presented for comparison. All

concentrations are below the Risk-Based Concentrations and are believed to be the result of normal weed/pest management practices.

Table 2-5
Lake Louise Data Summary (OL-003)

Parameter (µg/kg)	Sample I.D.			RBC Concentrations	
	MEM/OLL-M-0001-01	MEM/OLL-M-0002-01	MEM/OLL-M-0003-01	Residential	Industrial
2,4,5,-TP (Silvex)	ND	ND	2.4	630,000	8,200,000
Dieldrin	5.5 P	4.9 P	18 P	40	180

Note:
ND - None Detected (Below Practical Quantitation Limit)

2.4 OL-006

Facility OL-006 consists of open lands north, west and east of the airfield runways. Currently, approximately 350 acres of OL-006 are leased for agricultural purposes. Due primarily to the past operations associated with an active military airfield, there were four areas that were investigated during the field activities:

- the mechanical/hydraulic arresting gear (1559) on the northern portion of Runway 22
- the "turkey shoot" area in the western portion of OL-006 (this area is not associated with airfield operations)
- any suspect areas that may have been impacted by fuel spills associated with the approach and take off areas of each runway
- the gasoline pits (seven existing, 68 former locations) along the runway apron.

2.4.1 Arresting Gear

2.4.1.1 Site Description

The mechanical/hydraulic arresting gear (Facility 1559) is a device designed to aid aircraft in emergency situations and for training for such events. It is on the southeast side of the main runway (Figure 2-4). The steel structure is surface-mounted along the runway and actuated by a combination of hydraulics and mechanical springs. Gasoline motors are used to provide hydraulic pressure that aids in rewinding the arresting wire after landing. Due to the presence of soil stains around the arresting gear equipment on the east side of the runway, soil was removed by the NAS Memphis Public Works Office (PWO), Environmental Division. A small area was excavated to a depth of approximately 6 inches below grade, containerized, and disposed of by the PWO. Confirmatory samples were collected within the excavated area and analyzed for TCLP benzene, TCLP TPH (extractable range), and TCLP TPH (volatile range). Analytical results were below practical quantitation limit for TCLP benzene and TCLP TPH (volatile range) and 1.01 mg kg (ppm) for TCLP TPH (extractable range). The resulting pit was then backfilled with clean soil.

2.4.1.2 Sampling Rationale

Two soil samples were collected from the 6- to 12-inch interval and submitted to an offsite laboratory for TPH analysis using USEPA Method 418.1. Samples were collected from the floor and the area adjacent to the original excavation area (MEM/0AGS000101 and MEM/0AGS000201) to determine if petroleum contaminants had migrated horizontally or vertically beyond the excavated area (see Figure 2-4).

2.4.1.3 Findings and Conclusions

Analytical data generated during this investigation indicate that the remedial activities performed by the NAS Memphis Public Works Office effectively cleaned up the petroleum contamination associated with the arresting gear (i.e., results were below practical quantitation limits).

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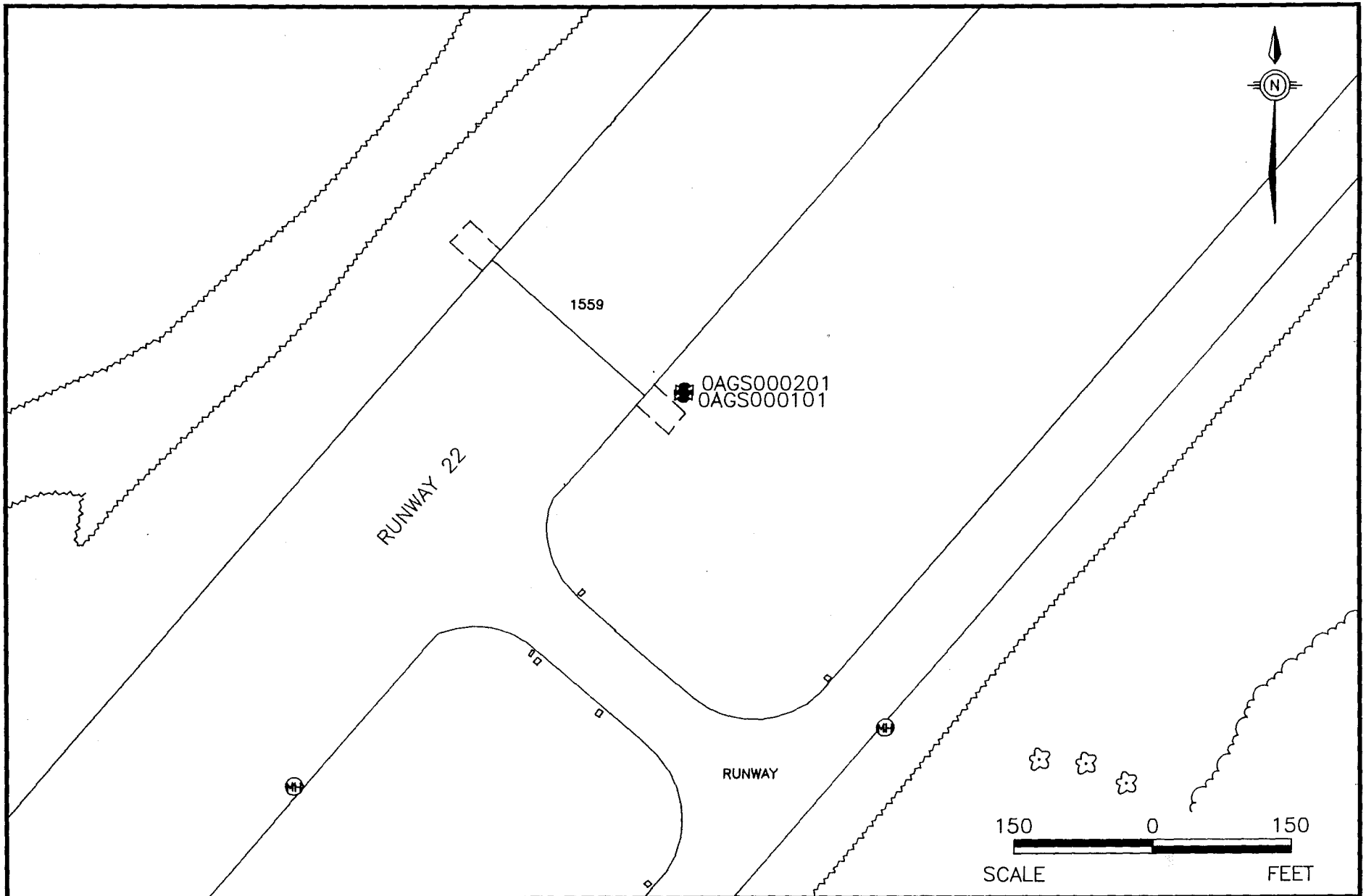

GRAY AREA
INVESTIGATION REPORT
NAS MEMPHIS
MILLINGTON, TN.

FIGURE 2–4
ARRESTING GEAR (OL–006)
SAMPLE LOCATION MAP

DWG DATE: 06/14/95 | DWG NAME: 94MAGR1

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2.4.2 Gasoline Pits

2.4.2.1 Site Description

The gasoline pits were connected to the former N-94 Tank Farm (SWMU 15). The pits and tank farm made up the old "Aqua System" that was used to resupply aircraft with fuel and hydraulic fluid while on the apron during the 1930s. After the use of the Aqua System was discontinued, solvents, paint wastes, waste oil, etc. were improperly disposed of in several N-94 tanks. Construction plans from 1942 indicate that 68 of the 75 pits were removed as part of an apron overlay project. The supply lines were capped and left in place. This has been confirmed by E/A&H using a geophysical survey. The geophysical data indicated that the supply lines are currently in place, however, there was no indication that the tanks still exist. The gasoline pits are in two parallel rows in an area previously occupied by the taxiway for the airfield (see Figure 2-5). The pits are divided into Type A and Type B pits, based on construction details and function. Type A pits contain the necessary distribution equipment to serve a 2-inch gasoline supply line. These pits are generally metal-lined concrete vaults set 3 to 4 feet below the original grade. The Type B pits contain the same gasoline distribution equipment, but also include a 500-gallon steel lubricating oil UST and associated piping and hoses. These tanks are generally buried adjacent to the pits and are 5 to 7 feet below the original grade.

2.4.2.2 Sampling Rationale

Soil samples were collected from two intervals in the area immediately adjacent to the pits to determine if releases occurred: 1) during the filling of the tanks or refueling of the aircraft or 2) due to leakage in the supply lines or the hydraulic oil USTs. Only one of the two parallel rows of pits was accessible for sampling. It is beneath a layer of asphalt along the northern edge of the present apron. The remaining row is beneath the apron. The data generated from this investigation will be used as an indication of whether releases could have occurred from either row of gasoline pits.

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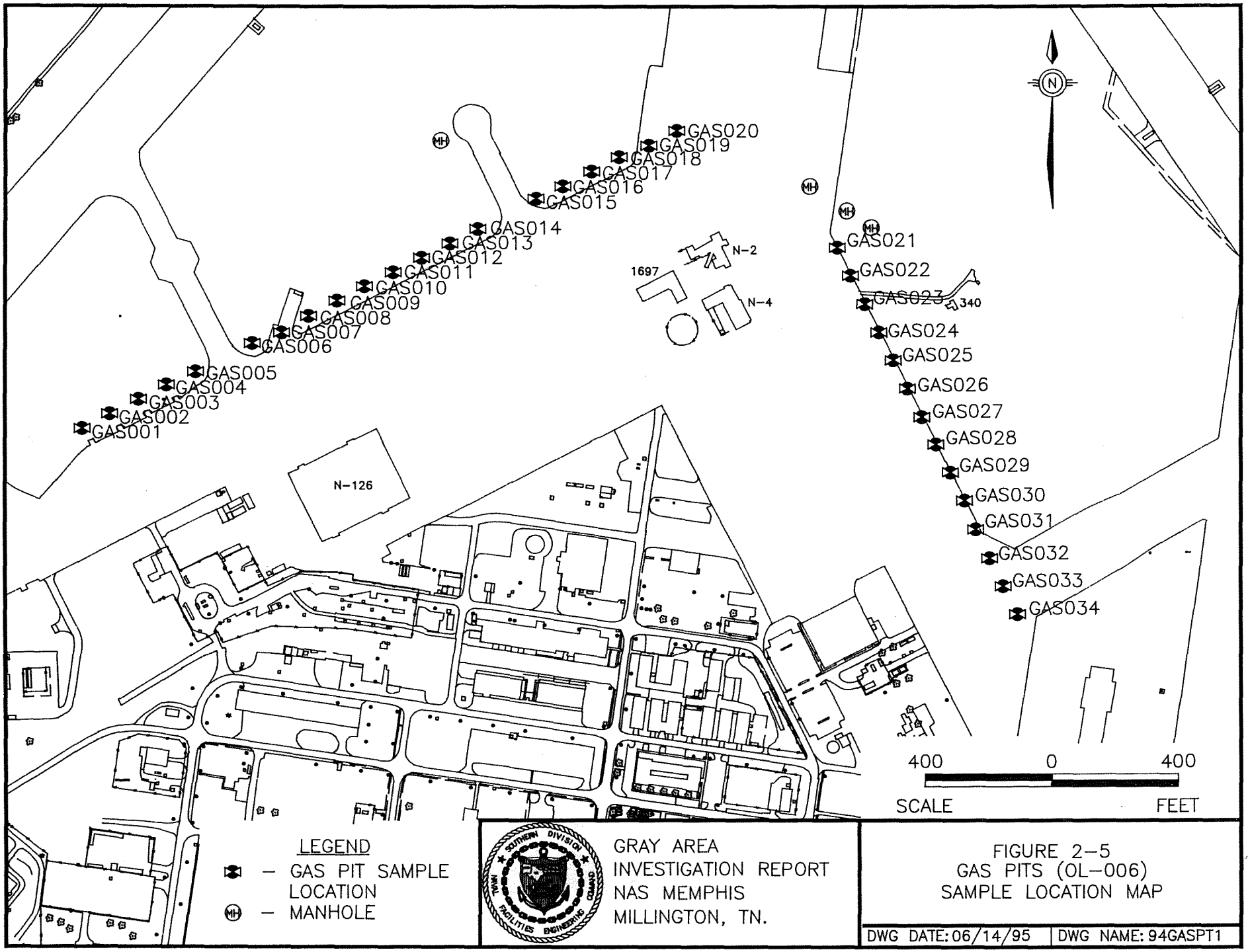
GAS001
GAS002
GAS003
GAS004
GAS005
GAS006
GAS007
GAS008
GAS009
GAS010
GAS011
GAS012
GAS013
GAS014
GAS015
GAS016
GAS017
GAS018
GAS019
GAS020
GAS021
GAS022
GAS023
GAS024
GAS025
GAS026
GAS027
GAS028
GAS029
GAS030
GAS031
GAS032
GAS033
GAS034
MH
N-2
N-4
1697
340
N-126
N
400 0 400
SCALE FEET
LEGEND
– GAS PIT SAMPLE LOCATION
– MANHOLE
SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND
GRAY AREA INVESTIGATION REPORT
NAS MEMPHIS
MILLINGTON, TN.
FIGURE 2–5
GAS PITS (OL–006)
SAMPLE LOCATION MAP
DWG DATE: 06/14/95
DWG NAME: 94GASPT1

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Surficial soil samples were collected from the 0- to 12-inch interval using a stainless-steel hand auger, while subsurficial samples were collected from 9 to 10 feet below land surface (presumed to be below the former locations of the USTs) adjacent to the asphalt using an ATV-mounted GeoProbe® soil sampler. Surficial soil samples were collected from every pit location; however, subsurficial samples were collected only at the pits which formerly contained hydraulic oil USTs (Type B pits). The surficial soil samples were analyzed for TPH, while the subsurficial soil samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) and Total Volatile Organics (TVO) using a heated headspace technique. Sample locations are shown in Figure 2-5.

2.4.2.3 Findings and Conclusions

Analytical data generated during this investigation (Tables 2-6 and 2-7) indicate releases of petroleum products to the surrounding soil during the past years. Petroleum hydrocarbons were detected at all pits, except pits 1, 3, 4, 7, and 29. Although concentrations were below TDEC UST Action Levels (250-500 ppm), they are indicative of a release (see Table 2-6). BTEX and TVO (Table 2-7) were also identified in the subsurficial soil in pits 10, 12, and 29 indicating a subsurface release from either the supply line or the hydraulic oil UST.

It should be noted that the values for benzene, toluene, ethylbenzene, xylenes, and TVO were generated using a heated headspace analytical technique. This method is a screening technique and is intended to be used for screening purposes only. These values are not directly comparable to the TPH values presented or to results for other test methods such as EPA Methods 8020 (BTEX) and 8240 (VOCs).

Table 2-6
Gas Pits Soil TPH Data Summary (OL-006)
(mg/kg)

Sample I.D. No.	TPH
GAS-S-0002-01	1600
GAS-S-0005-01	130
GAS-S-0009-01	81
GAS-S-0010-01	220
GAS-C-0010-01	250
GAS-S-0011-01	100
GAS-S-0012-01	81
GAS-S-0013-01	360
GAS-S-0014-01	170
GAS-S-0015-01	270
GAS-S-0017-01	1700
GAS-S-0018-01	93
GAS-S-0019-01	320
GAS-S-0020-01	310
GAS-S-0021-01	85
GAS-S-0022-01	130
GAS-S-0023-01	82
GAS-S-0024-01	230
GAS-S-0025-01	140
GAS-S-0026-01	200
GAS-S-0027-01	180
GAS-S-0030-01	120
GAS-C-0030-01	140

Notes:

ND - None Detected (Below Practical Quantitation Limit)
NA - Not Analyzed

Table 2-7
Gas Pits Soil Volatile Compounds Data Summary (OL-006)
(µg/kg)

Sample I.D. No.	Benzene	Toluene	Ethylbenzene	Xylenes	TVO
GAS-S-0010-10	12	ND	11	48	290
GAS-S-0012-10	297	223	30	131	1900
GAS-C-0012-10	46	99	18	101	960
GAS-S-0029-10	170	106	18	75	1600

Notes:

ND - None Detected (Below Practical Quantitation Limit)
NA - Not Analyzed

2.4.3 Approach Areas

2.4.3.1 Site Description

The NAS Memphis airfield consists of four runways; one active (Runway 4/22), one secondary (Runway 14/32), and two inactive (Runways 9/27 and 16/32) as shown in Figure 2-6. The approach and takeoff areas of each runway have the potential for petroleum contamination resulting from fuel spills and "blow back" associated with flight operations.

2.4.3.2 Sampling Rationale

Surface soil samples were collected from the end of each runway to determine if a release of petroleum products has resulted due to normal flight operations. Soil samples were collected from the 0- to 6-inch interval using a stainless-steel hand auger and submitted to an offsite laboratory for VOC analysis. Volatile organic analysis was used to indicate if a release of any volatile compounds, which are associated with gasoline, diesel, and jet fuel products, has occurred. Soil sample locations are shown in Figure 2-6.

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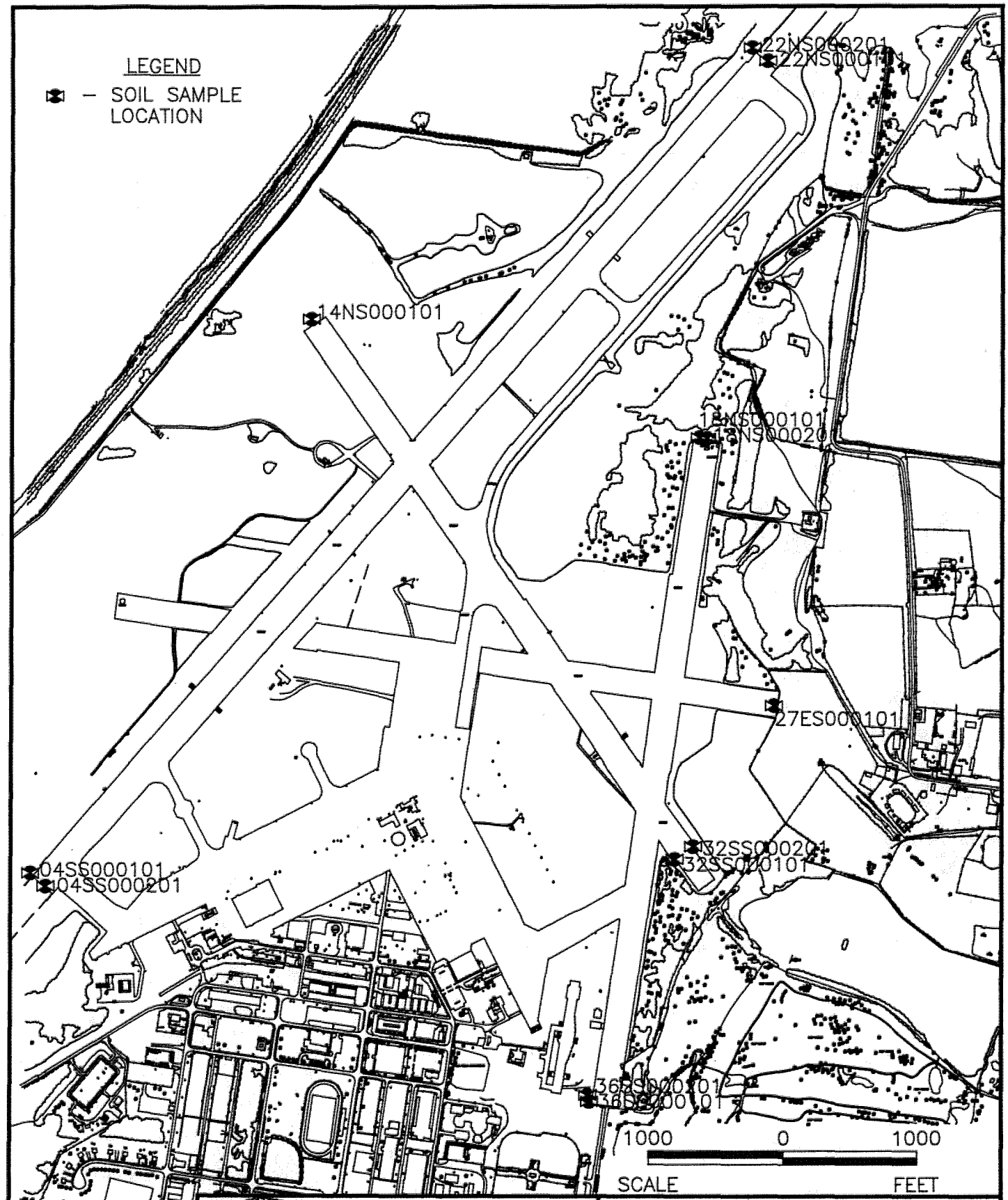

GRAY AREA
INVESTIGATION REPORT
NAS MEMPHIS
MILLINGTON, TN.

FIGURE 2–6
APPROACH/TAKE–OFF AREAS
(OL–006)
SAMPLE LOCATION MAP

DWG DATE: 06/14/95 | DWG NAME: 94RNWAY1

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2.4.3.3 Findings and Conclusions

Analytical data generated from this investigation do not indicate that petroleum releases have occurred in the runway approach and takeoff areas. However, based on interviews with Navy personnel, solvents, primarily 1,1,1-Trichloroethane (TCA), were used to clean the jet turbines as the aircraft sat on the runway. This was done by pouring or spraying the solvent into the intake portion of the engine while the engine was running, presumably resulting in a spray of TCA into the investigatory area. The detection of TCA in the surface soils (see Table 2-8) in this area are consistent with this type operation.

Based on the analytical results of the initial sampling event, the decision was made to collect an additional sample from the Runway 27 Approach Area at the location of the highest TCA hit. During the Assembly C RFI field investigation, samples were collected using direct push technology (DPT) from the loess and fluvial deposits. Soil samples were collected from the shallow soil (1.5 - 3 ft. bls) and the saturated zone in the loess (17.5 - 19.0 ft. bls). A groundwater sample was collected from the fluvial deposits (53 - 54 ft. bls). Both the soil and groundwater samples were submitted to an onsite laboratory for analysis by EPA Method 8021 (VOCs). Analytical results for all samples collected during this phase of the investigation were below practical quantitation limits, indicating that the low level contamination in detected in this area is confined to the surficial soil (0 to 1 ft. bls).

Table 2-8
Approach/Take-off Areas Data Summary (OL-006)
(µg/kg)

Sample I.D.	Methylene Chloride	1,1,1-Trichloroethane	Tetrachloroethane
MEM/04S-S-0001-01	ND	ND	2 J
MEM/04S-S-0002-01	1 J	2 J	ND
MEM/14N-S-0001-01	ND	5 J	ND
MEM/18N-S-0001-01	ND	3 J	ND
MEM/18N-S-0002-01	ND	5 J	ND

Table 2-8
Approach/Take-off Areas Data Summary (OL-006)
(µg/kg)

Sample I.D.		Methylene Chloride	1,1,1-Trichloroethane	Tetrachloroethane
MEM/22N-S-0001-01		ND	2 J	ND
MEM/22N-S-0002-01		ND	ND	ND
MEM/27E-S-0001-01		ND	11 J	ND
MEM/32S-S-0001-01		2 J	3 J	ND
MEM/32S-C-0001-01		2 J	3 J	ND
MEM/32S-S-0002-01		2 J	3 J	ND
MEM/36S-S-0001-01		ND	2 J	ND
MEM/36S-S-0002-01		ND	ND	ND
RISK-BASED CONCENTRATIONS	RESIDENTIAL	85,000	7,000,000	12,000
	INDUSTRIAL	380,000	92,000,000	55,000

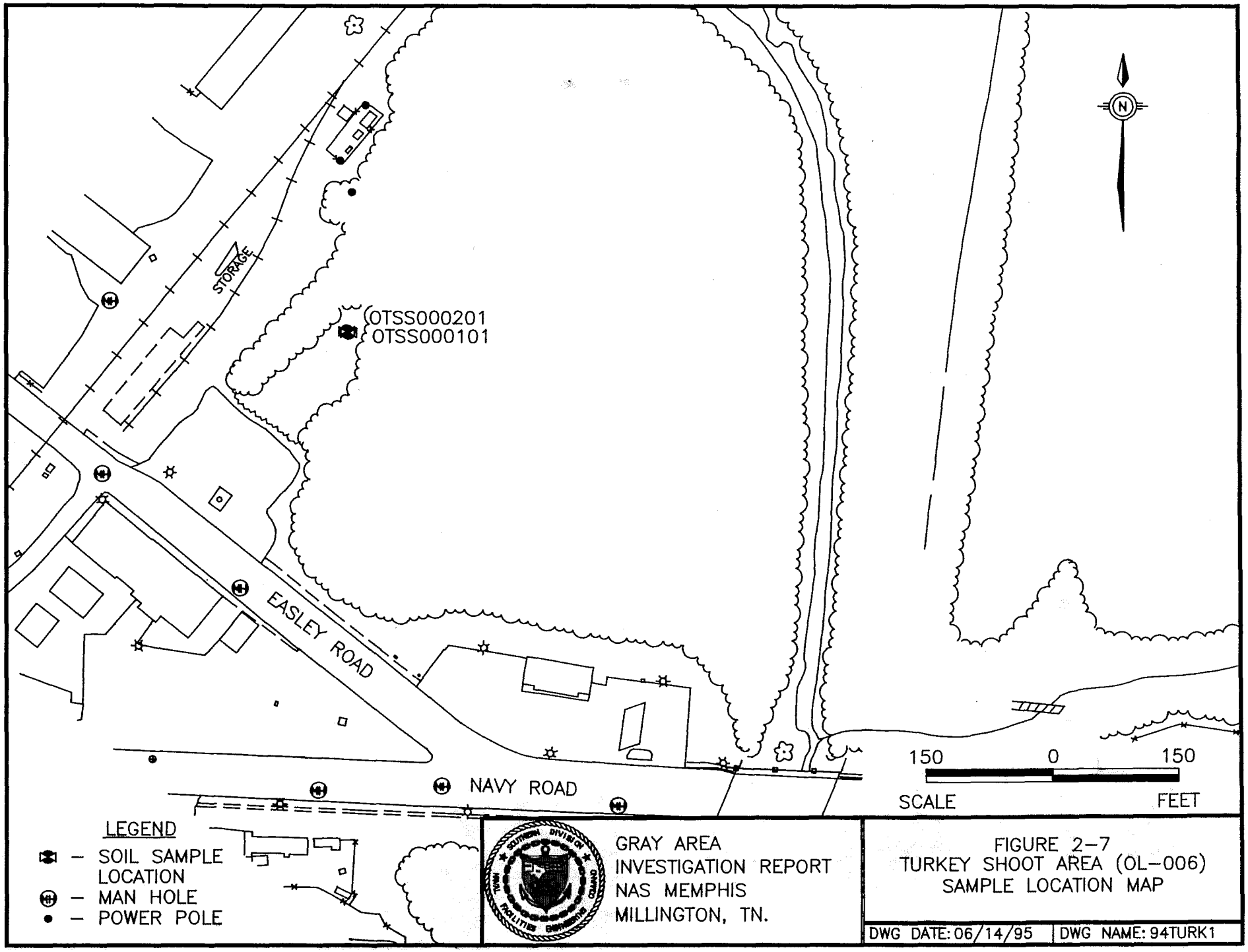
Note:

ND - None Detected (Below Practical Quantitation Limit)

2.4.4 Turkey Shoot Area

2.4.4.1 Site Description

The "turkey shoot" area is in the western portion of OL-006 in an undeveloped area that has been used for annual recreational firearm-related activities by the City of Millington (see Figure 2-7). The event was held for approximately 10 years. A "turkey shoot" was a target shooting activity where the participants shot at a silhouette, presumably of a turkey, from a distance of 25 to 50 yards with a shotgun. The area is presently not in use and is heavily vegetated. This area was investigated due to the potential for lead contamination associated with such activities.


STORAGE
OTSS000201
OTSS000101
EASLEY ROAD
NAVY ROAD
N
150
0
150
SCALE
FEET
LEGEND
– SOIL SAMPLE LOCATION
– MAN HOLE
– POWER POLE
GRAY AREA
INVESTIGATION REPORT
NAS MEMPHIS
MILLINGTON, TN.
FIGURE 2–7
TURKEY SHOOT AREA (OL–006)
SAMPLE LOCATION MAP
DWG DATE: 06/14/95
DWG NAME: 94TURK1

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2.4.4.2 Sampling Rationale

Surficial soil samples were collected from the suspected target area (Figure 2-7). This area was chosen due to the shape of the area and the tree line. Two soil samples were collected from the same location from the 0- to 6-inch interval with a stainless-steel hand auger. One sample (MEM/OTSS000101) was submitted to an offsite laboratory for total lead analysis. The second sample, collected from the same location and interval, was submitted for TCLP lead analysis. This parameter was selected to determine if lead pellets in the soil were of sufficient quantity to cause lead to leach into the surrounding soil and groundwater.

2.4.4.3 Findings and Conclusions

Surficial soil samples were collected and analyzed for both Total Lead and TCLP lead. The results presented in Table 2-9 indicate lead contamination from past site activities.

Table 2-9
Turkey Shoot Area Data Summary

Parameter	Sample I.D.		OSWER Directive 9355.4-12 Soil Screening Levels (mg/kg)	TCLP Limits (mg/L)
	MEM/OTS-S-0001-01	MEM/OTS-S-0002-01		
Total Lead (mg/kg)	1260	NA	400	—
TCLP Lead (mg/l)	NA	3.6	—	5

2.5 Facility N-7

2.5.1 Site Description

Facility N-7 is a 23,162-square-foot hangar built in 1943 that is currently used to train Navy personnel in catapult and landing gear operations (see Figure 2-8). Past operations included aircraft maintenance; however, no maintenance activities are conducted at this time. The facility formerly had an aboveground storage tank (AST) located on the south side of the building. The AST pad is still present.

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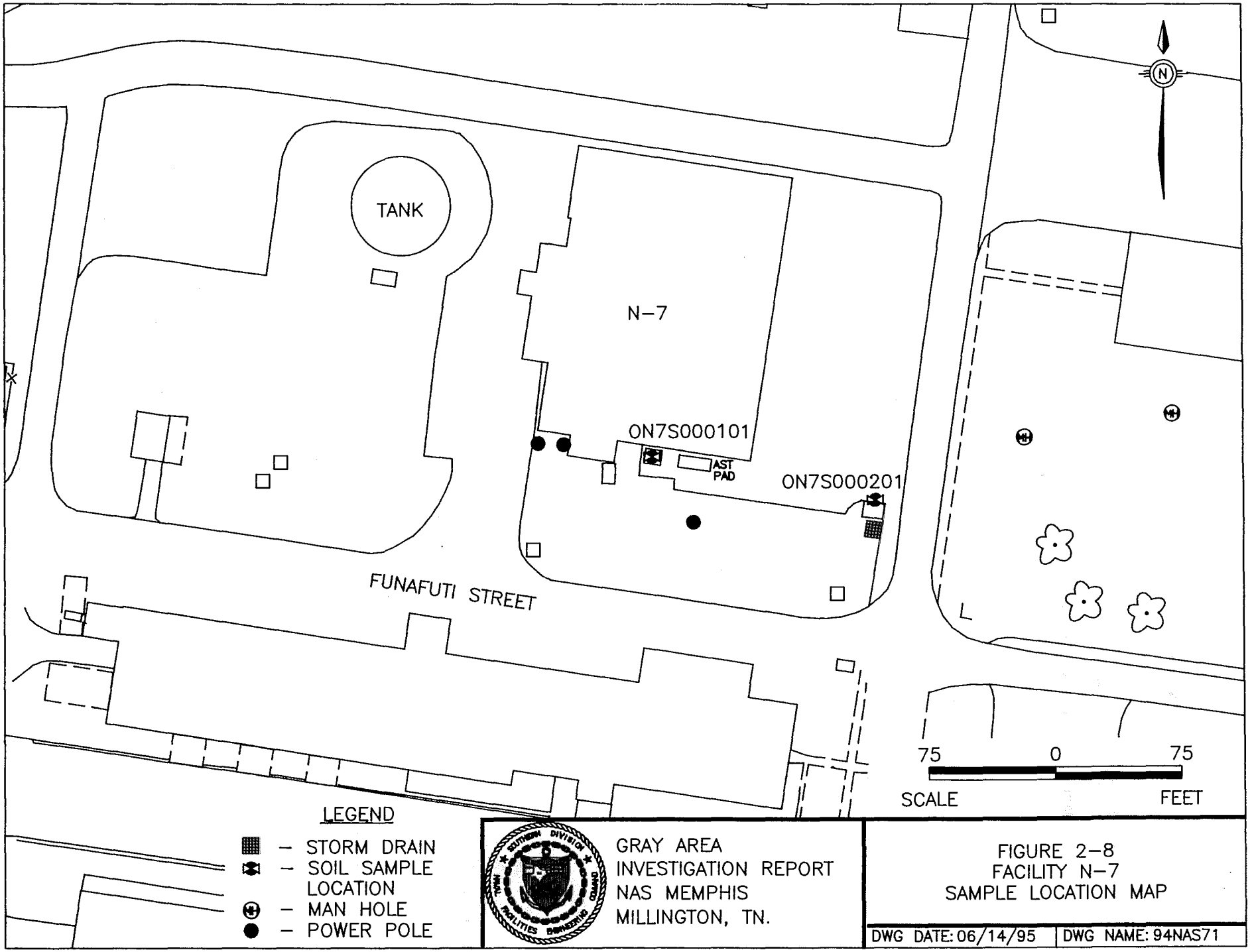
TANK
N-7
ON7S000101
AST PAD
ON7S000201
FUNAFUTI STREET
N
75 0 75
SCALE FEET
LEGEND
– STORM DRAIN
– SOIL SAMPLE LOCATION
– MAN HOLE
– POWER POLE
GRAY AREA
INVESTIGATION REPORT
NAS MEMPHIS
MILLINGTON, TN.
FIGURE 2-8
FACILITY N-7
SAMPLE LOCATION MAP
DWG DATE: 06/14/95
DWG NAME: 94NAS71

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2.5.2 Sampling Rationale

Surficial soil samples were collected at this site to determine if a release had occurred in association with the AST or any previous operations. Two soil samples were collected from the 0- to 12-inch interval using a stainless steel hand auger (Figure 2-8). One sample (MEM/0N7S000101) was collected from within the AST pad, which contains soil and vegetative growth. The *Verification Sampling Work Plan for Potential New Sites (Gray Area Work Plan)* specified that "one sediment sample will be collected from within the storm drain" to characterize any material that may have flowed into or been dumped into the storm drain. However, the storm drain grate was not removable. Therefore, a soil sample was collected from an area adjacent to the storm drain (MEM/0N7S000201).

2.5.3 Findings and Conclusions

The analytical data generated during the field investigation indicate elevated levels of polynuclear aromatic hydrocarbons (PAHs), semivolatile organic compounds, and volatile organic compounds in the Facility N-7 area. Table 2-10 summarizes the data collected and presents the Risk-Based Concentration for each compound. The source of these compounds is suspected to be fuel from the AST, and runoff from the street.

Table 2-10
Facility N-7 Data Summary
(µg/kg)

Parameter	Sample I.D.		RBC Concentration	
	MEM/0N7-S-0001-01	MEM/0N7-S-0002-01	Residential	Industrial
Naphthalene	ND	40 J	3,100,000	41,000,000
4-Chloro-3-methylphenol	ND	41 J	—	—
Acenaphthene	77 J	430	4,700,000	61,000,000
Dibenzofuran	ND	180 J	2,300,000[1]	31,000,000[1]
Fluorene	55 J	420	3,100,000	41,000,000
Phenanthrene	550	3800 E	2,300,000[1]	31,000,000[1]

Table 2-10
Facility N-7 Data Summary
(µg/kg)

Parameter	Sample I.D.		RBC Concentration	
	MEM/ON7-S-0001-01	MEM/ON7-S-0002-01	Residential	Industrial
Anthracene	110 J	1000	23,000,000	310,000,000
Carbazole	110 J	ND	32,000	140,000
Fluoranthene	720	5300 E	3,100,000	41,000,000
Pyrene	630	4500 E	2,300,000	31,000,000
Benzo(a)anthracene	360 J	2700	880	3900
Chrysene	380 J	2900	88,000	390,000
bis-(2-ethylhexyl)phthalate (BEHP)	ND	96 J	46,000	200,000
Benzo(b)fluoranthene	300 J	2500	880	3,900
Benzo(k)fluoranthene	260 JY	1700 Y	8,800	39,000
Benzo(a)pyrene	270 J	2300	88	390
Indeno(1,2,3-cd)pyrene	170 J	1500	880	3,900
Dibenzo(a,h,)anthracene	61 JY	590 Y	88	390
Benzo(g,h,i)perylene	170 J	1700	2,300,000[1]	31,000,000[1]
Acetone	5 J	ND	78,000,000	100,000,000

Notes:

(-) Data not available for these compounds
1 Data presented is the RBC for pyrene as a surrogate

2.6 OL-003

Facility OL-003 is a section of land (146 acres) directly associated with Facility 1460 (Riding Academy) and Facilities 1574 and 1575 (Lazy Anchor Ranch). It is bordered by private property to the north and east. It is primarily open grassland with two large ponds designated as wetland areas (NAS Memphis Base Master Plan - 3/93). A small area on the south portion of OL-003 was formerly the site of a small arms shooting range.

2.6.1 MWR Ponds

2.6.1.1 Site Description

The Morale, Welfare, and Recreation (MWR) ponds are in the pastures to the north and northeast of the Lazy Anchor Ranch, which is maintained by the MWR (see Figure 2-9). The ponds are shallow with water levels varying greatly with rainfall conditions. Pond 1 is approximately 1 acre and is north of the Lazy Anchor Ranch complex. Pond 2 is less than 1 acre and is northeast of the complex and contains little or no water. The primary function of both of these ponds is to provide water for horses. These areas were determined to need further evaluation during the EBS because of the potential for pesticide and/or herbicide accumulation due to past weed/pest management practices.

2.6.1.2 Sampling Rationale

Three samples were collected from each pond from the near shore sediments using a stainless steel spoon. Sample locations were selected based on surrounding topography and accessibility. The samples were submitted to an offsite laboratory for chlorinated pesticides, chlorinated herbicides, and organophosphorus pesticide analyses (Pond 1: MEM/0P1M000101, MEM/0P1M000201, and MEM/0P1M000301; Pond 2: MEM/0P2M000101, MEM/0P2M000201, and MEM/0P2M000301). Sediment sample locations are shown in Figure 2-9.

2.6.1.3 Findings and Conclusions

The data generated during the investigation indicates normal pesticide usage. Low concentrations of two common pesticides were detected in the sediments in MWR Pond 1. However, these concentrations were well below the Risk-Based Concentrations (see Table 2-11).

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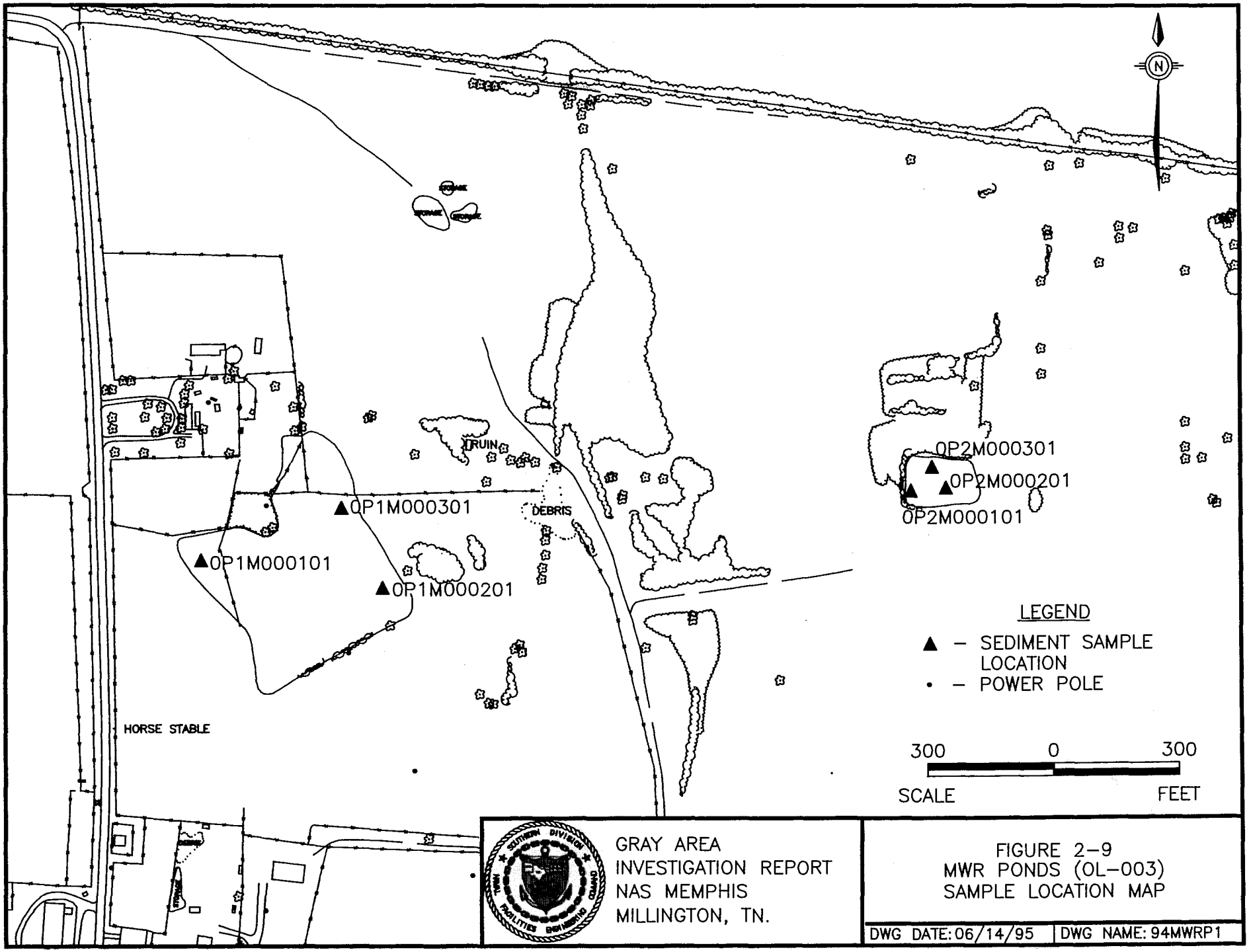
N
RUIN
DEBRIS
0P1M000301
0P1M000101
0P1M000201
0P2M000301
0P2M000201
0P2M000101
HORSE STABLE
LEGEND
▲ – SEDIMENT SAMPLE LOCATION
• – POWER POLE
300 0 300
SCALE FEET
GRAY AREA
INVESTIGATION REPORT
NAS MEMPHIS
MILLINGTON, TN.
FIGURE 2–9
MWR PONDS (OL–003)
SAMPLE LOCATION MAP
DWG DATE: 06/14/95
DWG NAME: 94MWRP1

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Table 2-11
MWR Pond #1 Data Summary

Parameter (µg/kg)	Sample I.D.				Risk-Based Concentrations	
	MEM/OP1-M-0001-01	MEM/OP1-M-0002-01	MEM/OP1-M-0003-01	MEM/OP1-N-0003-01	Residential	Industrial
2,4-D	ND	ND	ND	17	780,000	10,000,000
2,4,5-T	ND	ND	3.7	ND	780,000	10,000,000

Note:

ND - None Detected (Below Practical Quantitation Limit)

2.6.2 MWR Shooting Range

2.6.2.1 Site Description

The MWR shooting range was a small arms shooting range used by Navy personnel (Figure 2-10). The use of the range has been discontinued and all facilities have been removed. The berm associated with this shooting area was reportedly excavated and used for fill during construction of the Naval Hospital. The area is presently maintained as pasture land.

2.6.2.2 Sampling Rationale

The surficial soil in this area was sampled to determine if lead contamination associated with the shooting range had impacted the area. Four soil samples were collected from the 0- to 12-inch interval using a stainless-steel hand auger and submitted to an offsite laboratory for total lead analysis. The samples (MEM/0SRS000101, MEM/0SRS000201, MEM/0SRS000301, and MEM/0SRS000401) were collected from the area determined to be the former location of the berm. Sample locations are shown in Figure 2-10.

2.6.2.3 Findings and Conclusions

Low concentrations of lead were detected in the soil samples collected from the assumed former location of the berm, however, these concentrations are below the EPA recommended soil

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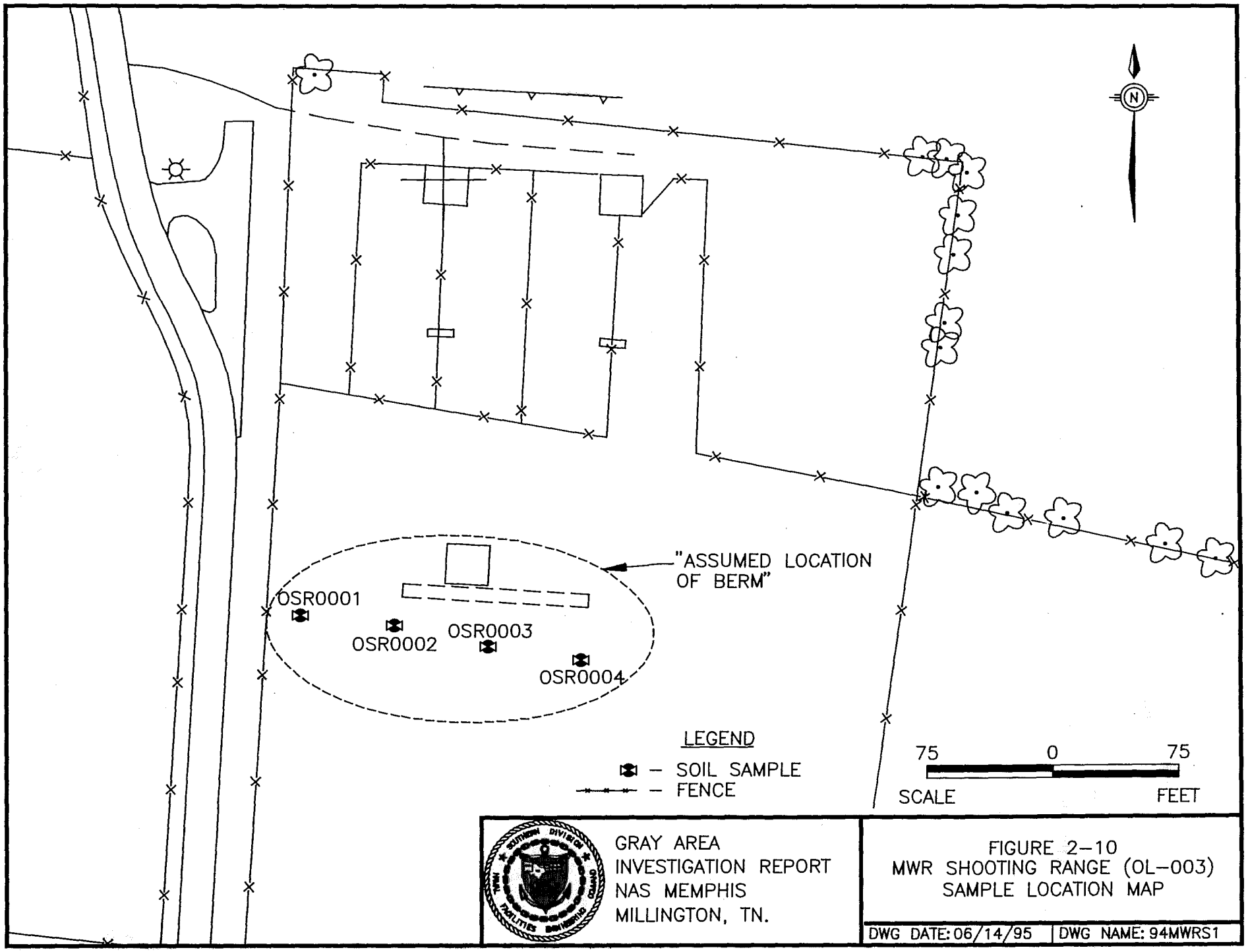
N
"ASSUMED LOCATION OF BERM"
OSR0001
OSR0002
OSR0003
OSR0004
LEGEND
– SOIL SAMPLE
– FENCE
75
0
75
SCALE
FEET
GRAY AREA
INVESTIGATION REPORT
NAS MEMPHIS
MILLINGTON, TN.
FIGURE 2–10
MWR SHOOTING RANGE (OL–003)
SAMPLE LOCATION MAP
DWG DATE: 06/14/95
DWG NAME: 94MWRS1

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screening concentrations for lead (400 ppm) for residential land use (see Table 2-12). This level is listed in the July 14, 1994, Office of Solid Waste and Emergency Response (OSWER) Directive 9355.4-12, *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*. These are screening concentrations and are not intended to be used as cleanup standards. It is possible that any contamination resulting from past activities has been excavated and removed in the past.

Table 2-12
MWR Shooting Range Data Summary

Parameters (mg/kg)	Sample I.D.					
	MEM/OSR-S-0001-01	MEM/OSR-S-0002-01	MEM/OSR-C-0002-01	MEM/OSR-S-0003-01	MEM/OSR-S-0004-01	OSWER Directive 9355.4-12
Lead	14	22.9 S	15.6	18 S	13.2	400

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3.0 DATA VALIDATION

All data collected during the field activities associated with the Gray Area Investigation were subjected to a data validation review. In this review process, the data is reviewed by sample delivery group, which includes all samples submitted to the laboratory at a specific time. Samples which were not associated with this investigation were included in some of the sample delivery groups due to investigations being performed concurrently; therefore, this validation discussion will also include samples collected, and data generated, during the RCRA Facility Investigation (RFI) Interim Measures Study (IMS)at S-142 Hazardous Waste Accumulation Point (SWMU 45).

The majority of the samples were analyzed by National Environmental Testing, Inc. (NET) Laboratory in Cambridge, Massachusetts. The field and laboratory quality control results were validated to assess the useability of the data. With minor exceptions, the data validation process found the data to be acceptable and useable for interpretation. A full discussion on the validation procedures and conclusions regarding data useability may be found in Appendix B. Tables summarizing the validated data may be found in Appendix B, Attachment A.

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4.0 CONCLUSIONS AND RECOMMENDATIONS

The following section outlines the recommended course of action for each facility/site covered in this investigation. The reclassification of the sites is based on the classifications set forth in the NAS Memphis Environmental Baseline Survey. Any additional sampling or remedial activities recommended in this document will be outlined in detail at a later date. Table 4-1 summarizes the recommendations and reclassifications of the facilities

Table 4-1
Recommendations and Reclassifications

Facility		Original Classification	Reclassification	Recommendations
Facility N-122		Gray	Gray	Requires Further Action
Facility N-4		Gray	Lt. Green	NFA
Facility 761 (Navy Lake Complex)	Navy Lake	Gray	Lt. Green	NFA
	Tanya Lake	Gray	Lt. Green	NFA
	Lake Louise	Gray	Lt. Green	NFA
OL-006	Arresting Gear	Gray	Lt. Green	NFA
	Gas Pits	Gray	Gray	Requires Further Action
	Approach Areas	Gray	Gray	Requires Further Action
	Turkey Shoot Area	Gray	Gray	Requires Further Action
Facility N-7		Gray	Gray	Requires Further Action
OL-003	MWR Ponds	Gray	Lt. Green	NFA
	MWR Shooting Range	Gray	Lt. Green	NFA

Note:

NFA - No Further Action

4.1 Facility N-122

Because concentrations exceeded the RBCs within the surficial soil in the low-lying area south of the building, it is recommended that the soil in this area be removed and confirmation samples collected. The area to be excavated and the number of samples to be collected will be outlined at a later time.

4.2 Facility N-4

The area investigated near Facility N-4 is next to the runway apron, which is the same location as the gasoline pits. Analytical data indicate a release occurred at the gasoline pits area, which may be the source of contamination in the Facility N-4 samples. Because this area will be investigated during the expanded investigation of the gasoline pits, no further action is recommended for Facility N-4.

4.3 Facility 761 (Navy Lake Complex)

4.3.1 Navy Lake

Analytical data from the sediment samples collected at Navy Lake were below the practical quantitation limits for pesticides and herbicides. No further action is recommended at this site.

4.3.2 Tanya Lake

Test results indicate that the concentration of the organophosphorus pesticide Merphos detected in the sediment samples from Tanya Lake was well below the Risk-Based Concentration set by the USEPA. The concentration detected was consistent with normal weed/pest management practices, therefore, no further action is recommended.

4.3.3 Lake Louise

Analytical data indicate concentrations of pesticides in the sediments at Lake Louise well below the Risk-Based Concentration set by the USEPA. The concentrations detected were consistent with normal weed/pest management practices, therefore, no further action is recommended.

4.4 OL-006

4.4.1 Arresting Gear

The NAS Memphis Public Works Office performed remedial activities at this site in response to a fuel spill. The spill area was excavated to a sufficient depth and area to remove all petroleum-contaminated soil. Samples collected did not indicate the presence of residual fuel or fuel constituents; therefore, no further action is recommended.

4.4.2 Gasoline Pits

Analytical data generated during this investigation indicate a release. The elevated concentrations of petroleum-related contaminants detected at both the surface (0 to 12 inches) and at 10 feet below land surface indicate that the area has been impacted by both surficial spills and leaking supply lines and/or USTs.

An expanded investigation is planned that will include the removal of the seven remaining pits/tanks. After removing the tanks, confirmatory samples will be collected at each pit/tank location and analyzed for Full Scan Analyses (VOCs, SVOCs, chlorinated pesticides, herbicides, organophosphorus pesticides, metals, and cyanide). The results of the confirmatory sampling will be used as an indicator for all of the pits in this investigation, that is, the generated data will be assumed to be representative of all pits/tanks in question. If contamination exceeding RBCs is detected, the BRAC Cleanup Team will decide if additional investigation is necessary. Petroleum contaminated surface soil will be removed from the area of Pit 17 and resampling will take place using the confirmatory sampling parameters. The details of the activities to be performed as part of the expanded investigation will be outlined at a later time.

4.4.3 Approach Areas

The approach areas do not exhibit evidence of contamination that would indicate a release of fuel or fuel-related products to the environment. However, due to the presence of TCA in the

surficial soil, further investigation was warranted to determine if solvent contamination has migrated vertically downward, impacting groundwater.

During the implementation of the NAS Memphis RCRA Facility Investigation for Assembly C SWMUs, samples were collected in the approach area of Runway 27. This is the area that exhibited the highest detected amount of 1,1,1-TCA (sample I.D. - MEM\27EG000101). Samples of both soil and groundwater were collected using the Direct Push Technology (DPT) procedures described in Section 4.4.4.3 of the *NAS Memphis Comprehensive RFI Work Plan (E/A&H, 1994)*. The samples were submitted to an onsite field laboratory for VOC analysis (EPA Method 8240). The results of this investigation indicated that the solvent release detected in approach area has remained confined to the surficial soil, and has not migrated vertically downward.

4.4.4 Turkey Shoot Area

Due to the elevated concentrations of total lead found in the soil, further investigation is warranted at this site. Additional samples will be collected from the surficial soil using an unbiased, grid-based approach. The sampling grid will be centered on the previous sample location. The exact location and number of samples to be collected will be outlined at a later time. Samples will be submitted to a laboratory for total lead. Select samples will also be analyzed using the Synthetic Precipitation Leachate Procedure (USEPA Method 13.12) This analytical method is used to simulate the leaching process caused by normal rainfall, as opposed to landfill conditions which the TCLP simulates.

4.5 Facility N-7

Due to the concentrations of SVOCs detected in the soil surrounding the AST pad and the storm drain, it is recommended that the soil in these areas be removed and the area resampled. Excavation and resampling will continue until the data indicate the concentrations in the soil are

below RBCs. The area to be excavated and the number of confirmation samples to be collected will be outlined at a later time.

4.6 OL-003

4.6.1 MWR Ponds

Pesticide/herbicide concentrations detected in the sediments collected from the MWR ponds indicate normal weed/pest management practices and are below RBCs; therefore, no further action is recommended for this area.

4.6.2 MWR Shooting Range

Lead present in the soil at the MWR shooting range is well below the USEPA recommended soil screening level of 400 mg/kg. The USEPA notes in the referenced Office of Solid Waste and Emergency Response (OSWER) Directive that these concentrations are not to be used as clean-up goals, but as guidance. Because the concentrations are so far below the guidance level, no further action is recommended for this site.

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Appendix A

Risk-Based Concentrations Table (Third Qtr. 1994)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region III
841 Chestnut Street
Philadelphia, Pennsylvania 19107

July 11, 1994

SUBJECT: Risk-Based Concentration Table, Third Quarter 1994

FROM: Roy L. Smith, Ph.D., Senior Toxicologist
Technical Support Section (3HW13)

TO: RBC Table mailing list

Attached is the EPA Region III risk-based concentration (RBC) table, which we have distributed quarterly to all interested parties since 1991. If you are not currently on the mailing list, but would like to be, please contact Anna Poulton (phone: 215-597-3179, fax: 215-597-9890) and give her your name, address, and phone and fax numbers.

The table contains reference doses and carcinogenic potency slopes (obtained from IRIS through July 1, 1994, HEAST through November March 1994, the Superfund Health Risk Technical Support Center, and other EPA sources) for nearly 600 chemicals. These toxicity constants have been combined with "standard" exposure scenarios to calculate RBCs - chemical concentrations corresponding to fixed levels of risk (*i.e.*, a hazard quotient of 1, or lifetime cancer risk of 10^{-6}, whichever occurs at a lower concentration) in water, air, fish tissue, and soil.

The Region III toxicologists use the table to screen sites not yet on the NPL, respond rapidly to citizen inquiries, and spot-check formal baseline risk assessments. The background materials provide the complete basis for all the calculations, with the intent of showing users exactly how the RBCs were developed. Simply put, RBCs are risk assessments run in reverse. For a single contaminant in a single medium, under standard default exposure assumptions, the RBC corresponds to the target risk or hazard quotient.

The calculations also have several important limitations. Specifically excluded from consideration are (1) transfers from soil to air and groundwater, and (2) cumulative risk from multiple contaminants or media. Also, the toxicity information in the table has been assembled by hand, and (despite extensive checking and years of use) may contain errors. It's advisable to cross-check before relying on any RfDs or CPSs in the table. If you find any errors, please send me a note.

Lately, many callers have asked whether the risk-based concentrations can be used as valid no-action levels or cleanup levels, especially for soils.. The answer is a bit complex. First, it is important to realize that the RBC table does not constitute regulation or guidance, and should not be viewed as a substitute for a site-specific risk assessment. For sites where:

1. A single medium is contaminated;

2. A single contaminant contributes nearly all of the health risk;

3. Volatilization or leaching of that contaminant from soil is expected not to be significant;

4. The exposure scenarios used in the RBC table are appropriate for the site;

5. The fixed risk levels used in the RBC table are appropriate for the site; and

6. Risk to ecological receptors is expected not to be significant;

the risk-based concentrations would probably be protective as no-action levels or cleanup goals. However, to the extent that a site deviates from this description, as most do, the RBCs would not necessarily be appropriate.

To summarize, the table should generally not be used to (1) set cleanup or no-action levels at CERCLA or RCRA Corrective Action sites, (2) substitute for EPA guidance for preparing baseline risk assessments, or (3) determine if a waste is hazardous under RCRA.

This issue of the RBC table includes new toxicity constants and media concentrations, which are marked on the table in underlined boldface print. On pg. 4, the source of the toxicological constants labeled "ECAO-Cincinnati" has been clarified.

I get many telephone calls about the RBC table, but am often unable to answer the phone. Many of you have the same problem, so we play a lot of "phone tag". Last quarter, I suggested that you fax me (at 215-597-9890) your technical questions and concerns, so I could respond by return fax. This has worked very well for me, and I hope you have been satisfied with my responses. I would like to continue this method. Of course, if you don't have access to a fax machine, I will also continue to respond to voice mail messages.

Attachment

c. Soil ingestion ([mg· y]/[kg· d]):

$$IFSadj = \frac{EDc \cdot IRSc}{BWc} + \frac{(EDtot - EDc) \cdot IRSa}{BWa}$$

2. Residential water use (µg/L). Volatilization terms were calculated only for compounds with "***" in the "VOC" column. Compounds having a Henry's Law constant greater than 10^{-5} were considered volatile. The list may be incomplete, but is unlikely to include false positives. The equations and the volatilization factor (VF, above) were obtained from RAGS IB. Oral potency slopes and reference doses were used for both oral and inhaled exposures for volatile compounds lacking inhalation values. Inhaled potency slopes were substituted for unavailable oral potency slopes only for volatile compounds; inhaled RfDs were substituted for unavailable oral RfDs for both volatile and non-volatile compounds.

a. Carcinogens: Calculations were based on combined childhood and adult exposure.

$$\frac{TR \cdot ATc \cdot 1000 \frac{ug}{mg}}{EFr \cdot ([VF \cdot IFAadj \cdot CPSi] + [IFWadj \cdot CPSo])}$$

b. Non-carcinogens: Calculations were based on adult exposure.

$$\frac{THQ \cdot BWa \cdot ATn \cdot 1000 \frac{ug}{mg}}{EFr \cdot EDtot \cdot \left(\frac{VF \cdot IRAa}{RfDi} + \frac{IRWa}{RfDo}\right)}$$

3. Air (µg/m^3). Oral potency slopes and references were used where inhalation values were not available.

a. Carcinogens: Calculations were based on combined childhood and adult exposure.

$$\frac{TR \cdot ATc \cdot 1000 \frac{ug}{mg}}{EFr \cdot IFAadj \cdot CPSi}$$

b. Non-carcinogens: Calculations were based on adult exposure.

$$\frac{THQ \cdot RfDi \cdot BWa \cdot ATn \cdot 1000 \frac{ug}{mg}}{EFr \cdot EDtot \cdot IRAa}$$

4. Fish (mg/kg):

a. Carcinogens: Calculations were based on adult exposure.

$$\frac{TR \cdot BWa \cdot ATc}{EFr \cdot EDtot \cdot \frac{IRF}{1000\ \frac{g}{kg}} \cdot CPSo}$$

b. Non-carcinogens: Calculations were based on adult exposure.

$$\frac{THQ \cdot RfDo \cdot BWa \cdot ATn}{EFr \cdot EDtot \cdot \frac{IRF}{1000\ \frac{g}{kg}}}$$

5. Soil commercial/industrial (mg/kg): The default exposure assumption that only 50% of incidental soil ingestion occurs at work has been omitted. Calculations were based on adult occupational exposure.

a. Carcinogens:

$$\frac{TR \cdot BWa\ ATc}{EFo \cdot EDo \cdot \frac{IRSa}{10^6\ \frac{mg}{kg}} \cdot CPSo}$$

b. Non-carcinogens:

$$\frac{THQ \cdot RfDo \cdot BWa \cdot ATn}{EFo \cdot EDo \cdot \frac{IRSa}{10^6\ \frac{mg}{kg}}}$$

6. Soil residential (mg/kg):

a. Carcinogens: Calculations were based on combined childhood and adult exposure.

$$\frac{TR \cdot ATc}{EFr \cdot \frac{IFSadj}{10^6\ \frac{mg}{kg}} \cdot CPSo}$$

b. Non-carcinogens: Calculations were based on childhood exposure only.

$$\frac{THQ \cdot RfDo \cdot BWc \cdot ATn}{EFr \cdot EDc \cdot \frac{IRSc}{10^6\ \frac{mg}{kg}}}$$

Risk-Based Concentration Table
Background Information

General: Separate carcinogenic and non-carcinogenic risk-based concentrations were calculated for each compound for each pathway. The concentration in the table is the lower of the two, rounded to two significant figures. The following terms and values were used in the calculations:

Exposure variables	Value	Name
1-General:		
Carcinogenic potency slope oral (risk per mg/kg/d):	*	CPSo
Carcinogenic potency slope inhaled (risk per mg/kg/d):	*	CPSi
Reference dose oral (mg/kg/d):	*	RfDo
Reference dose inhaled (mg/kg/d):	*	RfDi
Target cancer risk:	1e-06	TR
Target hazard quotient:	1	THQ
Body weight, adult (kg):	70	BWa
Body weight, age 1-6 (kg):	15	BWc
Averaging time carcinogens (d):	25550	ATc
Averaging time non-carcinogens (d):	ED*365	ATn
Inhalation, adult (m3/d):	20	IRAa
Inhalation, child (m3/d):	12	IRAc
Inhalation factor, age-adjusted (m3-y/kg-d):	11.66	IFAadj
Tap water ingestion, adult (L/d):	2	IRWa
Tap water ingestion, age 1-6 (L/d):	1	IRWc
Tap water ingestion factor, age-adjusted (L-y/kg-d):	1.09	IFWadj
Fish ingestion (g/d):	54	IRF
Soil ingestion, adult (mg/d):	100	IRSa
Soil ingestion, age 1-6 (mg/d):	200	IRSc
Soil ingestion factor, age adjusted (mg-y/kg-d):	114.29	IFSadj
2-Residential:		
Exposure frequency (d/y):	350	EFr
Exposure duration, total (y):	30	EDtot

Exposure variables	Value	Name
Exposure duration, age 1-6 (y):	6	EDc
Volatilization factor (L/m3):	0.5	VF
3-Occupational:		
Exposure frequency (d/y):	250	EFo
Exposure duration (y):	25	EDo
* = Contaminant-specific toxicity parameters		

The priority among sources of toxicological constants was as follows: (1) IRIS, (2) HEAST, (3) HEAST alternative method, (4) EPA Superfund Health Risk Technical Support Center, (5) withdrawn from IRIS or HEAST, and (6) other EPA documents. Each source was used only if numbers from higher-priority sources were unavailable. The EPA Superfund Health Risk Technical Support Center, part of the Chemical Mixtures Branch of ECAO-Cincinnati, develops provisional RfDs and CPSs on request for contaminants not in IRIS or HEAST. These provisional values are labeled "e = EPA-ECAO provisional" in the table. It is possible they may be obsolete. If one of the "e" constants is important to a Superfund risk assessment, consider requesting, through a Regional risk assessor, a new provisional value.

Algorithms:

1. Age-adjusted factors: Because contact rates with tap water, ambient air, and residential soil are different for children and adults, carcinogenic risks during the first 30 years of life were calculated using age-adjusted factors. These factors approximated the integrated exposure from birth until age 30 by combining contact rates, body weights, and exposure durations for two age groups - small children and adults. The age-adjusted factor for soil was obtained from RAGS IB; the others were developed by analogy.

a. Air inhalation ([$m^3 \cdot y$]/[$kg \cdot d$]):

$$IFAadj = \frac{EDc \cdot IRAc}{BWc} + \frac{(EDtot - EDc) \cdot IRAa}{BWa}$$

b. Tap water ingestion ([$L \cdot y$]/[$kg \cdot d$]):

$$IFWadj = \frac{EDc \cdot IRWc}{BWc} + \frac{(EDtot - EDc) \cdot IRWa}{BWa}$$

Sources: i=IRIS h=HEAST a=HEAST alt. w=Withdrawn from IRIS or HEAST s=EPA-ECAO provisional o=Other EPA documents *Basis of RBC: c=carcinogenic effects n=noncarcinogenic effects.*

Contaminant	CAS	RfDo mg/kg/d	RfDi mg/kg/d	CPSo kg·d/mg	CPSi kg·d/mg	VOC	Tap water µg/L	Ambient air µg/m3	Fish mg/kg	Industrial soil mg/kg	Residential soil mg/kg
Acephate	30560191	4.00E-03 i		8.70E-03 i			7.7 c	0.72 c	0.36 c	330 c	73 c
Acetaldehyde	75070		2.57E-03 i		7.70E-03 i		94 n	0.81 c			
Acetochlor	34256821	2.00E-02 i					730 n	73 n	27 n	20000 n	1600 n
Acetone	67641	1.00E-01 i					3700 n	370 n	140 n	100000 n	7800 n
Acetone cyanohydrin	75865	7.00E-02 h	2.86E-03 a				2600 n	10 n	95 n	72000 n	5500 n
Acetonitrile	75078	6.00E-03 i	1.43E-02 a				220 n	52 n	8.1 n	6100 n	470 n
Acetophenone	98862	1.00E-01 i	5.71E-06 w			***	0.042 n	0.021 n	140 n	100000 n	7800 n
Acifluorfen	62476599	1.30E-02 i					470 n	47 n	18 n	13000 n	1000 n
Acrolein	107028	2.00E-02 h	5.71E-06 i				730 n	0.021 n	27 n	20000 n	1600 n
Acrylamide	79061	2.00E-04 i		4.50E+00 i	4.55E+00 i		0.015 c	0.0014 c	0.0007 c	0.64 c	0.14 c
Acrylic acid	79107	5.00E-01 i	1.00E-03 i				18000 n	3.7 n	680 n	510000 n	39000 n
Acrylonitrile	107131	1.00E-03 h	5.71E-04 i	5.40E-01 i	2.38E-01 i		0.12 c	0.026 c	0.0058 c	5.3 c	1.2 c
Alachlor	15972608	1.00E-02 i		8.00E-02 h			0.84 c	0.078 c	0.039 c	36 c	8 c
Alar	1596845	1.50E-01 i					5500 n	550 n	200 n	150000 n	12000 n
Aldicarb	116063	1.00E-03 i					37 n	3.7 n	1.4 n	1000 n	78 n
Aldicarb sulfone	1646884	1.00E-03 i					37 n	3.7 n	1.4 n	1000 n	78 n
Aldrin	309002	3.00E-05 i		1.70E+01 i	1.71E+01 i		0.004 c	0.00037 c	0.00019 c	0.17 c	0.038 c
Ally	74223646	2.50E-01 i					9100 n	910 n	340 n	260000 n	20000 n
Allyl alcohol	107186	5.00E-03 i					180 n	18 n	6.8 n	5100 n	390 n
Allyl chloride	107051	5.00E-02 w	2.86E-04 i				1800 n	1 n	68 n	51000 n	3900 n
Aluminum phosphide	20859738	4.00E-04 i					15 n	1.5 n	0.54 n	410 n	31 n
Amdro	67485294	3.00E-04 i					11 n	1.1 n	0.41 n	310 n	23 n
Ametryn	834128	9.00E-03 i					330 n	33 n	12 n	9200 n	700 n
m-Aminophenol	591275	7.00E-02 h					2600 n	260 n	95 n	72000 n	5500 n
4-Aminopyridine	504245	2.00E-05 h					0.73 n	0.073 n	0.027 n	20 n	1.6 n
Amitraz	33089611	2.50E-03 i					91 n	9.1 n	3.4 n	2600 n	200 n
Ammonia	7664417		2.86E-02 i				1000 n	100 n			
Ammonium sulfamate	7773060	2.00E-01 i					7300 n	730 n	270 n	200000 n	16000 n
Aniline	62533		2.86E-04 i	5.70E-03 i			10 n	1 n	0.55 c	500 c	110 c
Antimony and compounds	7440360	4.00E-04 i					15 n	1.5 n	0.54 n	410 n	31 n
Antimony pentoxide	1314609	5.00E-04 h					18 n	1.8 n	0.68 n	510 n	39 n
Antimony potassium tartrate	304610	9.00E-04 h					33 n	3.3 n	1.2 n	920 n	70 n
Antimony tetroxide	1332316	4.00E-04 h					15 n	1.5 n	0.54 n	410 n	31 n
Antimony trioxide	1309644	4.00E-04 h					15 n	1.5 n	0.54 n	410 n	31 n
Apollo	74115245	1.30E-02 i					470 n	47 n	18 n	13000 n	1000 n
Aramite	140578	5.00E-02 h		2.50E-02 i	2.49E-02 i		2.7 c	0.25 c	0.13 c	110 c	26 c
Arsenic	7440382	3.00E-04 i					11 n	1.1 n	0.41 n	310 n	23 n
Arsenic (as carcinogen)	7440382			1.75E+00 i	1.51E+01 i		0.038 c	0.00041 c	0.0018 c	1.6 c	0.37 c
Arsine	7784421		1.43E-05 i				0.52 n	0.052 n			
Assure	76578148	9.00E-03 i					330 n	33 n	12 n	9200 n	700 n
Asulam	3337711	5.00E-02 i					1800 n	180 n	68 n	51000 n	3900 n
Atrazine	1912249	3.50E-02 i		2.22E-01 h			0.3 c	0.028 c	0.014 c	13 c	2.9 c

Sources: i=IRIS h=HEAST a=HEAST alt. w=Withdrawn from IRIS or HEAST e=EPA-ECAO provisional o=Other EPA documents *Basis of RBC: c=carcinogenic effects n=noncarcinogenic effects.*

Contaminant	CAS	RfDo mg/kg/d	RfDi mg/kg/d	CPSo kg·d/mg	CPSi kg·d/mg	VOC	Tap water µg/L	Ambient air µg/m3	Fish mg/kg	Industrial soil mg/kg	Residential soil mg/kg
Avermectin B1	65195553	4.00E-04 i					15 n	1.5 n	0.54 n	410 n	31 n
Azobenzene	103333			1.10E-01 i	1.08E-01 i		0.61 c	0.058 c	0.029 c	26 c	5.8 c
Barium and compounds	7440393	7.00E-02 i	1.43E-04 e				2600 n	0.52 n	95 n	72000 n	5500 n
Baygon	114261	4.00E-03 i					150 n	15 n	5.4 n	4100 n	310 n
Bayleton	43121433	3.00E-02 i					1100 n	110 n	41 n	31000 n	2300 n
Baythroid	68359375	2.50E-02 i					910 n	91 n	34 n	26000 n	2000 n
Benefin	1861401	3.00E-01 i					11000 n	1100 n	410 n	310000 n	23000 n
Benomyl	17804352	5.00E-02 i					1800 n	180 n	68 n	51000 n	3900 n
Bentazon	25057890	2.50E-03 i					91 n	9.1 n	3.4 n	2600 n	200 n
Benzaldehyde	100527	1.00E-01 i				***	610 n	370 n	140 n	100000 n	7800 n
Benzene	71432		1.71E-03 e	2.90E-02 i	2.90E-02 i	***	0.36 c	0.22 c	0.11 c	99 c	22 c
Benzenethiol	108985	1.00E-05 h					0.37 n	0.037 n	0.014 n	10 n	0.78 n
Benzidine	92875	3.00E-03 i		2.30E+02 i	2.35E+02 i		0.00029 c	0.000027 c	0.000014 c	0.012 c	0.0028 c
Benzoic acid	65850	4.00E+00 i					150000 n	15000 n	5400 n	1000000 n	310000 n
Benzotrichloride	98077			1.30E+01 i			0.0052 c	0.00048 c	0.00024 c	0.22 c	0.049 c
Benzyl alcohol	100516	3.00E-01 h					11000 n	1100 n	410 n	310000 n	23000 n
Benzyl chloride	100447			1.70E-01 i		***	0.062 c	0.037 c	0.019 c	17 c	3.8 c
Beryllium and compounds	7440417	5.00E-03 i		4.30E+00 i	8.40E+00 i		0.016 c	0.00075 c	0.00073 c	0.67 c	0.15 c
Bidrin	141662	1.00E-04 i					3.7 n	0.37 n	0.14 n	100 n	7.8 n
Biphenthrin (Talstar)	82657043	1.50E-02 i					550 n	55 n	20 n	15000 n	1200 n
1,1-Biphenyl	92524	5.00E-02 i					1800 n	180 n	68 n	51000 n	3900 n
Bis(2-chloroisopropyl)ether	39638329	4.00E-02 i		7.00E-02 h	3.50E-02 h	***	0.26 c	0.18 c	0.045 c	41 c	9.1 c
Bis(chloromethyl)ether	542881			2.20E+02 i	2.17E+02 i	***	0.000049 c	0.000029 c	0.000014 c	0.013 c	0.0029 c
Bis(2-chloro-1-methylethyl)ether				7.00E-02 w	7.00E-02 w		0.96 c	0.089 c	0.045 c	41 c	9.1 c
Bis(2-ethylhexyl)phthalate (DEHP)	117817	2.00E-02 i		1.40E-02 i			4.8 c	0.45 c	0.23 c	200 c	46 c
Bis(chloroethyl)ether	111444			1.10E+00 i	1.16E+00 i	***	0.0092 c	0.0054 c	0.0029 c	2.6 c	0.58 c
Bisphenol A	80057	5.00E-02 i					1800 n	180 n	68 n	51000 n	3900 n
Boron (and borates)	7440428	9.00E-02 i	5.71E-03 h				3300 n	21 n	120 n	92000 n	7000 n
Boron trifluoride	7637072		2.00E-04 h				7.3 n	0.73 n			
Bromodichloromethane	75274	2.00E-02 i		6.20E-02 i		***	0.17 c	0.1 c	0.051 c	46 c	10 c
Bromoethene	593602				1.10E-01 h	***	0.096 c	0.057 c			
Bromoform (tribromomethane)	752[illegible]	2.00E-02 i		7.90E-03 i	3.85E-03 i	***	2.4 c	1.6 c	0.4 c	360 c	81 c
Bromomethane	74839	1.40E-03 i	1.43E-03 i			***	8.7 n	5.2 n	1.9 n	1400 n	110 n
4-Bromophenyl phenyl ether	101553	5.80E-02 o					2100 n	210 n	78 n	59000 n	4500 n
Bromophos	2104963	5.00E-03 h					180 n	18 n	6.8 n	5100 n	390 n
Bromoxynil	1689845	2.00E-02 i					730 n	73 n	27 n	20000 n	1600 n
Bromoxynil octanoate	1689992	2.00E-02 i					730 n	73 n	27 n	20000 n	1600 n
1,3-Butadiene	106990				9.80E-01 i	***	0.011 c	0.0064 c			
1-Butanol	71363	1.00E-01 i					3700 n	370 n	140 n	100000 n	7800 n
Butyl benzyl phthalate	85687	2.00E-01 i					7300 n	730 n	270 n	200000 n	16000 n
Butylate	2008415	5.00E-02 i					1800 n	180 n	68 n	51000 n	3900 n
sec-Butylbenzene	135988	1.00E-02 e				***	61 n	37 n	14 n	100[illegible]	780 n

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Contaminant	CAS	RfDo mg/kg/d	RfDi mg/kg/d	CPSo kg-d/mg	CPSi kg-d/mg	VOC	Tap water µg/L	Ambient air µg/m3	Fish mg/kg	Industrial soil mg/kg	Residential soil mg/kg
tert-Butylbenzene	104518	1.00E-02 s				***	61 n	37 n	14 n	10000 n	780 n
Butylphthalyl butylglycolate	85701	1.00E+00 i					37000 n	3700 n	1400 n	1000000 n	78000 n
Cacodylic acid	75605	3.00E-03 h					110 n	11 n	4.1 n	3100 n	230 n
Cadmium and compounds	7440439	5.00E-04 i			6.30E+00 i		18 n	0.00099 c	0.68 n	510 n	39 n
Caprolactam	105602	5.00E-01 i					18000 n	1800 n	680 n	510000 n	39000 n
Captafol	2425061	2.00E-03 i		8.60E-03 h			7.8 c	0.73 c	0.37 c	330 c	74 c
Captan	133062	1.30E-01 i		3.50E-03 h			19 c	1.8 c	0.9 c	820 c	180 c
Carbaryl	63252	1.00E-01 i					3700 n	370 n	140 n	100000 n	7800 n
Carbazole	86748			2.00E-02 h			3.4 c	0.31 c	0.16 c	140 c	32 c
Carbofuran	1563662	5.00E-03 i					180 n	18 n	6.8 n	5100 n	390 n
Carbon disulfide	75150	1.00E-01 i	2.86E-03 h			***	21 n	10 n	140 n	100000 n	7800 n
Carbon tetrachloride	56235	7.00E-04 i	5.71E-04 s	1.30E-01 i	5.25E-02 i	***	0.16 c	0.12 c	0.024 c	22 c	4.9 c
Carbosulfan	55285148	1.00E-02 i					370 n	37 n	14 n	10000 n	780 n
Carboxin	5234684	1.00E-01 i					3700 n	370 n	140 n	100000 n	7800 n
Chloral	75876	2.00E-03 i					73 n	7.3 n	2.7 n	2000 n	160 n
Chloramben	133904	1.50E-02 i					550 n	55 n	20 n	15000 n	1200 n
Chloranil	118752			4.03E-01 h			0.17 c	0.016 c	0.0078 c	7.1 c	1.6 c
Chlordane	57749	6.00E-05 i		1.30E+00 i	1.29E+00 i		0.052 c	0.0049 c	0.0024 c	2.2 c	0.49 c
Chlorimuron-ethyl	90982324	2.00E-02 i					730 n	73 n	27 n	20000 n	1600 n
Chlorine	7782505	1.00E-01 i					3700 n	370 n	140 n	100000 n	7800 n
Chlorine dioxide	10049044		5.71E-05 i				2.1 n	0.21 n			
Chloroacetaldehyde	107200	6.90E-03 o					250 n	25 n	9.3 n	7100 n	540 n
Chloroacetic acid	79118	2.00E-03 h					73 n	7.3 n	2.7 n	2000 n	160 n
2-Chloroacetophenone	532274		8.57E-06 i				0.31 n	0.031 n			
4-Chloroaniline	106478	4.00E-03 i					150 n	15 n	5.4 n	4100 n	310 n
Chlorobenzene	108907	2.00E-02 i	5.71E-03 s			***	39 n	21 n	27 n	20000 n	1600 n
Chlorobenzilate	510156	2.00E-02 i		2.70E-01 h	2.70E-01 h		0.25 c	0.023 c	0.012 c	11 c	2.4 c
p-Chlorobenzoic acid	74113	2.00E-01 h					7300 n	730 n	270 n	200000 n	16000 n
4-Chlorobenzotrifluoride	98566	2.00E-02 h					730 n	73 n	27 n	20000 n	1600 n
2-Chloro-1,3-butadiene	126998	2.00E-02 s	2.00E-03 h			***	14 n	7.3 n	27 n	20000 n	1600 n
1-Chlorobutane	109693	4.00E-01 h				***	2400 n	1500 n	540 n	410000 n	31000 n
Chlorodifluoromethane	75456		1.43e+01 i			***	87000 n	52000 n			
Chloroethane	75003	4.00E-01 s	2.86E+00 i			***	8600 n	10000 n	540 n	410000 n	31000 n
2-Chloroethyl vinyl ether	110758	2.50E-02 o				***	150 n	91 n	34 n	26000 n	2000 n
Chloroform	67663	1.00E-02 i		6.10E-03 i	8.05E-02 i	***	0.15 c	0.078 c	0.52 c	470 c	100 c
Chloromethane	74873			1.30E-02 h	6.30E-03 h	***	1.4 c	0.99 c	0.24 c	220 c	49 c
4-Chloro-2,2-methylaniline hydrochloride	3165933			4.60E-01 h			0.15 c	0.014 c	0.0069 c	6.2 c	1.4 c
4-Chloro-2-methylaniline	95692			5.80E-01 h			0.12 c	0.011 c	0.0054 c	4.9 c	1.1 c
beta-Chloronaphthalene	91587	8.00E-02 i					2900 n	290 n	110 n	82000 n	6300 n
o-Chloronitrobenzene	88733			2.50E-02 h		***	0.42 c	0.25 c	0.13 c	110 c	26 c
p-Chloronitrobenzene	100005			1.80E-02 h		***	0.59 c	0.35 c	0.18 c	160 c	35 c
2-Chlorophenol	95578	5.00E-03 i					180 n	18 n	6.8 n	5100 n	390 n

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Contaminant	CAS	RfDo ug/kg/d	RfDi mg/kg/d	CPSo kg·d/mg	CPSi kg·d/mg	VOC	Tap water µg/L	Ambient air µg/m3	Fish mg/kg	Industrial soil mg/kg	Residential soil mg/kg
2-Chloropropane	75296		2.86E-02 h			***	170 n	100 n			
Chlorothalonil	1897456	1.50E-02 i		1.10E-02 h			6.1 c	0.57 c	0.29 c	260 c	58 c
o-Chlorotoluene	95498	2.00E-02 i				***	120 n	73 n	27 n	20000 n	1600 n
Chlorpropham	101213	2.00E-01 i					7300 n	730 n	270 n	200000 n	16000 n
Chlorpyrifos	2921882	3.00E-03 i					110 n	11 n	4.1 n	3100 n	230 n
Chlorpyrifos-methyl	5598130	1.00E-02 h					370 n	37 n	14 n	10000 n	780 n
Chlorsulfuron	64902723	5.00E-02 i					1800 n	180 n	68 n	51000 n	3900 n
Chlorthiophos	60238564	8.00E-04 h					29 n	2.9 n	1.1 n	820 n	63 n
Chromium III and compounds	16065831	1.00E+00 i	5.71E-07 w				37000 n	0.0021 n	1400 n	1000000 n	78000 n
Chromium VI and compounds	7440473	5.00E-03 i			4.20E+01 i		180 n	0.00015 c	6.8 n	5100 n	390 n
Coal tar	8001589				2.20E+00 w			0.0028 c			
Cobalt	7440484	6.00E-02 e					2200 n	220 n	81 n	61000 n	4700 n
Coke Oven Emissions	8007452				2.17E+00 i			0.0029 c			
Copper and compounds	7440508	3.71E-02 h					1400 n	140 n	50 n	38000 n	2900 n
Crotonaldehyde	123739	1.00E-02 w		1.90E+00 h	1.90E+00 w		0.035 c	0.0033 c	0.0017 c	1.5 c	0.34 c
Cumene	98828	4.00E-02 i	2.57E-03 h				1500 n	9.4 n	54 n	41000 n	3100 n
Cyanides:											
Barium cyanide	542621	1.00E-01 w					3700 n	370 n	140 n	100000 n	7800 n
Calcium cyanide	592018	4.00E-02 i					1500 n	150 n	54 n	41000 n	3100 n
Copper cyanide	544923	5.00E-03 i					180 n	18 n	6.8 n	5100 n	390 n
Cyanazine	21725462	2.00E-03 h		8.40E-01 h			0.08 c	0.0075 c	0.0038 c	3.4 c	0.76 c
Cyanogen	460195	4.00E-02 i					1500 n	150 n	54 n	41000 n	3100 n
Cyanogen bromide	506683	9.00E-02 i					3300 n	330 n	120 n	92000 n	7000 n
Cyanogen chloride	506774	5.00E-02 i					1800 n	180 n	68 n	51000 n	3900 n
Free cyanide	57125	2.00E-02 i					730 n	73 n	27 n	20000 n	1600 n
Hydrogen cyanide	74908	2.00E-02 i					730 n	73 n	27 n	20000 n	1600 n
Potassium cyanide	151508	5.00E-02 i					1800 n	180 n	68 n	51000 n	3900 n
Potassium silver cyanide	506616	2.00E-01 i					7300 n	730 n	270 n	200000 n	16000 n
Silver cyanide	506649	1.00E-01 i					3700 n	370 n	140 n	100000 n	7800 n
Sodium cyanide	143339	4.00E-02 i					1500 n	150 n	54 n	41000 n	3100 n
Zinc cyanide	557211	5.00E-02 i					1800 n	180 n	68 n	51000 n	3900 n
Cyclohexanone	108941	5.00E+00 i				***	30000 n	18000 n	6800 n	1000000 n	390000 n
Cyclohexlamine	108918	2.00E-01 i					7300 n	730 n	270 n	200000 n	16000 n
Cyhalothrin/Karate	68085858	5.00E-03 i					180 n	18 n	6.8 n	5100 n	390 n
Cypermethrin	52315078	1.00E-02 i					370 n	37 n	14 n	10000 n	780 n
Cyromazine	66215278	7.50E-03 i					270 n	27 n	10 n	7700 n	590 n
Dacthal	1861321	5.00E-01 i					18000 n	1800 n	680 n	510000 n	39000 n
Dalapon	75990	3.00E-02 i					1100 n	110 n	41 n	31000 n	2300 n
Danitol	39515418	5.00E-04 w					18 n	1.8 n	0.68 n	5[illegible]	39 n
DDD	72548			2.40E-01 i			0.28 c	0.026 c	0.013 c	[illegible]	2.7 c
DDE	72559			3.40E-01 i			[illegible]	[illegible]	[illegible]	[illegible]	1.9 c

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Decabromodiphenyl ether	1163195	1.00E-02 i				***	61 n	37 n	14 n	10000 n	780 n
Demeton	8065483	4.00E-05 i					1.5 n	0.15 n	0.054 n	41 n	3.1 n
Diallate	2303164			6.10E-02 h		***	0.17 c	0.1 c	0.052 c	47 c	10 c
Diazinon	333415	9.00E-04 h					33 n	3.3 n	1.2 n	920 n	70 n
1,4-Dibromobenzene	106376	1.00E-02 i				***	61 n	37 n	14 n	10000 n	780 n
Dibromochloromethane	124481	2.00E-02 i		8.40E-02 i		***	0.13 c	0.075 c	0.038 c	34 c	7.6 c
1,2-Dibromo-3-chloropropane	96128		5.71E-05 i	1.40E+00 h	2.42E-03 h	***	0.048 c	0.21 n	0.0023 c	2 c	0.46 c
1,2-Dibromoethane	106934		5.71E-05 h	8.50E+01 i	7.70E-01 i	***	0.00075 c	0.0081 c	0.000037 c	0.034 c	0.0075 c
Dibutyl phthalate	84742	1.00E-01 i					3700 n	370 n	140 n	100000 n	7800 n
Dicamba	1918009	3.00E-02 i					1100 n	110 n	41 n	31000 n	2300 n
1,2-Dichlorobenzene	95501	9.00E-02 i	5.71E-02 e			***	370 n	210 n	120 n	92000 n	7000 n
1,3-Dichlorobenzene	541731	8.90E-02 o				***	540 n	320 n	120 n	91000 n	7000 n
1,4-Dichlorobenzene	106467		2.29E-01 i	2.40E-02 h		***	0.44 c	0.26 c	0.13 c	120 c	27 c
3,3'-Dichlorobenzidine	91941			4.50E-01 i			0.15 c	0.014 c	0.007 c	6.4 c	1.4 c
1,4-Dichloro-2-butene	764410				9.30E+00 h	***	0.0011 c	0.00067 c			
Dichlorodifluoromethane	75718	2.00E-01 i	5.71E-02 e			***	390 n	210 n	270 n	200000 n	16000 n
1,1-Dichloroethane	75343	1.00E-01 h	1.43E-01 e			***	810 n	520 n	140 n	100000 n	7800 n
1,2-Dichloroethane (EDC)	107062		2.86E-03 e	9.10E-02 i	9.10E-02 i	***	0.12 c	0.069 c	0.035 c	31 c	7 c
1,1-Dichloroethylene	75354	9.00E-03 i		6.00E-01 i	1.75E-01 i	***	0.044 c	0.036 c	0.0053 c	4.8 c	1.1 c
1,2-Dichloroethylene (cis)	156592	1.00E-02 h				***	61 n	37 n	14 n	10000 n	780 n
1,2-Dichloroethylene (trans)	156605	2.00E-02 i				***	120 n	73 n	27 n	20000 n	1600 n
1,2-Dichloroethylene (mixture)	540590	9.00E-03 h				***	55 n	33 n	12 n	9200 n	700 n
2,4-Dichlorophenol	120832	3.00E-03 i					110 n	11 n	4.1 n	3100 n	230 n
2,4-Dichlorophenoxyacetic Acid (2,4-D)	94757	1.00E-02 i				***	61 n	37 n	14 n	10000 n	780 n
4-(2,4-Dichlorophenoxy)butyric Acid	94826	8.00E-03 i					290 n	29 n	11 n	8200 n	630 n
1,2-Dichloropropane	78875		1.14E-03 i	6.80E-02 h		***	0.16 c	0.092 c	0.046 c	42 c	9.4 c
2,3-Dichloropropanol	616239	3.00E-03 i					110 n	11 n	4.1 n	3100 n	230 n
1,3-Dichloropropene	542756	3.00E-04 i	5.71E-03 i	1.75E-01 h	1.30E-01 h	***	0.077 c	0.048 c	0.018 c	16 c	3.7 c
Dichlorvos	62737	5.00e-04 i	1.43E-04 i	2.90E-01 i			0.23 c	0.022 c	0.011 c	9.9 c	2.2 c
Dicofol	115322			4.40E-01 w			0.15 c	0.014 c	0.0072 c	6.5 c	1.5 c
Dicyclopentadiene	77736	3.00E-02 h	5.71E-05 e			***	0.42 n	0.21 n	41 n	31000 n	2300 n
Dieldrin	60571	5.00E-05 i		1.60E+01 i	1.61E+01 i		0.0042 c	0.00039 c	0.0002 c	0.18 c	0.04 c
Diesel emissions			1.43E-03 i				52 n	5.2 n			
Diethyl phthalate	84662	8.00E-01 i					29000 n	2900 n	1100 n	820000 n	63000 n
Diethylene glycol, monobutyl ether	112345		5.71E-03 h				210 n	21 n			
Diethylene glycol, monoethyl ether	111900	2.00E+00 h					73000 n	7300 n	2700 n	1000000 n	160000 n
Diethylformamide	617845	1.10E-02 h					400 n	40 n	15 n	11000 n	860 n
Di(2-ethylhexyl)adipate	103231	6.00E-01 i		1.20E-03 i			56 c	5.2 c	2.6 c	2400 c	530 c
Diethylstilbestrol	56531			4.70E+03 h			0.000014 c	1.30E-06 c	6.70E-07 c	0.00061 c	0.00014 c
Difenzoquat (Avenge)	43222486	8.00E-02 i					2900 n	290 n	110 n	82000 n	6300 n
Diflubenzuron	35367385	2.00E-02 i					730 n	73 n	27 n	20000 n	1600 n
Diisopropyl methylphosphonate (DIMP)	1445756	8.00E-02 i					2900 n	290 n	110 n	82000 n	6300 n

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Dimethipin	55290647	2.00E-02 i					730 n	73 n	27 n	20000 n	1600 n
Dimethoate	60515	2.00E-04 i					7.3 n	0.73 n	0.27 n	200 n	16 n
3,3'-Dimethoxybenzidine	119904			1.40E-02 h			4.8 c	0.45 c	0.23 c	200 c	46 c
Dimethyl phthalate	131113	1.00E+01 h					370000 n	37000 n	14000 n	1000000 n	780000 n
Dimethyl terephthalate	120616	1.00E-01 i					3700 n	370 n	140 n	100000 n	7800 n
Dimethylamine	124403		5.71E-06 w				0.21 n	0.021 n			
2,4-Dimethylaniline hydrochloride	21436964			5.80E-01 h			0.12 c	0.011 c	0.0054 c	4.9 c	1.1 c
2,4-Dimethylaniline	95681			7.50E-01 h			0.09 c	0.0083 c	0.0042 c	3.8 c	0.85 c
N-N-Dimethylaniline	121697	2.00E-03 i					73 n	7.3 n	2.7 n	2000 n	160 n
3,3'-Dimethylbenzidine	119937			9.20E+00 h			0.0073 c	0.00068 c	0.00034 c	0.31 c	0.069 c
N,N-Dimethylformamide	68122	1.00E-01 h	8.57E-03 i				3700 n	31 n	140 n	100000 n	7800 n
1,1-Dimethylhydrazine	57147			2.60E+00_	3.50E+00_		0.026 c	0.0018 c	0.0012 c	1.1 c	0.25 c
1,2-Dimethylhydrazine	540738			3.70E+01 w	3.70E+01 w		0.0018 c	0.00017 c	0.000085 c	0.077 c	0.017 c
2,4-Dimethylphenol	105679	2.00E-02 i					730 n	73 n	27 n	20000 n	1600 n
2,6-Dimethylphenol	576261	6.00E-04 i					22 n	2.2 n	0.81 n	610 n	47 n
3,4-Dimethylphenol	95658	1.00E-03 i					37 n	3.7 n	1.4 n	1000 n	78 n
1,2-Dinitrobenzene	528290	4.00E-04 h					15 n	1.5 n	0.54 n	410 n	31 n
1,3-Dinitrobenzene	99650	1.00E-04 i					3.7 n	0.37 n	0.14 n	100 n	7.8 n
1,4-Dinitrobenzene	100254	4.00E-04 h					15 n	1.5 n	0.54 n	410 n	31 n
4,6-Dinitro-o-cyclohexyl phenol	131895	2.00E-03 i					73 n	7.3 n	2.7 n	2000 n	160 n
2,4-Dinitrophenol	51285	2.00E-03 i					73 n	7.3 n	2.7 n	2000 n	160 n
Dinitrotoluene mixture				6.80E-01 i			0.099 c	0.0092 c	0.0046 c	4.2 c	0.94 c
2,4-Dinitrotoluene	121142	2.00E-03 i					73 n	7.3 n	2.7 n	2000 n	160 n
2,6-Dinitrotoluene	606202	1.00E-03 h					37 n	3.7 n	1.4 n	1000 n	78 n
Dinoseb	88857	1.00E-03 i					37 n	3.7 n	1.4 n	1000 n	78 n
di-n-Octyl phthalate	117840	2.00E-02 h					730 n	73 n	27 n	20000 n	1600 n
1,4-Dioxane	123911			1.10E-02 i			6.1 c	0.57 c	0.29 c	260 c	58 c
Diphenamid	957517	3.00E-02 i					1100 n	110 n	41 n	31000 n	2300 n
Diphenylamine	122394	2.50E-02 i					910 n	91 n	34 n	26000 n	2000 n
1,2-Diphenylhydrazine	122667			8.00E-01 i	7.70E-01 i		0.084 c	0.0081 c	0.0039 c	3.6 c	0.8 c
Diquat	85007	2.20E-03 i					80 n	8 n	3 n	2200 n	170 n
Direct black 38	1937377			8.60E+00 h			0.0078 c	0.00073 c	0.00037 c	0.33 c	0.074 c
Direct blue 6	2602462			8.10E+00 h			0.0083 c	0.00077 c	0.00039 c	0.35 c	0.079 c
Direct brown 95	16071866			9.30E+00 h			0.0072 c	0.00067 c	0.00034 c	0.31 c	0.069 c
Disulfoton	298044	4.00E-05 i					1.5 n	0.15 n	0.054 n	41 n	3.1 n
1,4-Dithiane	505293	1.00E-02 i					370 n	37 n	14 n	10000 n	780 n
Diuron	330541	2.00E-03 i					73 n	7.3 n	2.7 n	2000 n	160 n
Dodine	2439103	4.00E-03 i					150 n	15 n	5.4 n	4100 n	310 n
Endosulfan	115297	6.00E-03 h					220 n	22 n	8.1 n	6100 n	470 n
Endothall	145733	2.00E-02 i					730 n	73 n	27 n	20000 n	1600 n
Endrin	72208	3.00E-04 i					11 n	1.1 n	0.41 n	310 n	23 n
Epichlo[illegible]in	106898	2.00E-03 h	2.86E-04[illegible]	9.90E-03 i	4.20E-03 i		6.8 c	1 n	0.32 c	[illegible]	65 c

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Contaminant	CAS	RfDo mg/kg/d	RfDi mg/kg/d	CPSo kg·d/mg	CPSi kg·d/mg	VOC	Tap water µg/L	Ambient air µg/m3	Fish mg/kg	Industrial soil mg/kg	Residential soil mg/kg
1,2-Epoxybutane	106887		5.71E-03 i				210 n	21 n			
Ethephon (2-chloroethyl phosphonic acid)	16672870	5.00E-03 i					180 n	18 n	6.8 n	5100 n	390 n
Ethion	563122	5.00E-04 i					18 n	1.8 n	0.68 n	510 n	39 n
2-Ethoxyethanol acetate	111159	3.00E-01 e					11000 n	1100 n	410 n	310000 n	23000 n
2-Ethoxyethanol	110805	4.00E-01 h	5.71E-02 i				15000 n	210 n	540 n	410000 n	31000 n
Ethyl acrylate	140885			4.80E-02 h			1.4 c	0.13 c	0.066 c	60 c	13 c
EPTC (S-Ethyl dipropylthiocarbamate)	759944	2.50E-02 i					910 n	91 n	34 n	26000 n	2000 n
Ethyl ether	60297	2.00E-01 i				***	1200 n	730 n	270 n	200000 n	16000 n
Ethyl methacrylate	97632	9.00E-02 h					3300 n	330 n	120 n	92000 n	7000 n
Ethyl acetate	141786	9.00E-01 i					33000 n	3300 n	1200 n	920000 n	70000 n
Ethylbenzene	100414	1.00E-01 i	2.86E-01 i			***	1300 n	1000 n	140 n	100000 n	7800 n
Ethylene cyanohydrin	109784	3.00E-01 h					11000 n	1100 n	410 n	310000 n	23000 n
Ethylene diamine	107153	2.00E-02 h					730 n	73 n	27 n	20000 n	1600 n
Ethylene glycol	107211	2.00E+00 i					73000 n	7300 n	2700 n	1000000 n	160000 n
Ethylene glycol, monobutyl ether	111762		5.71E-03 h				210 n	21 n			
Ethylene oxide	75218			1.02E+00 h	3.50E-01 h		0.066 c	0.018 c	0.0031 c	2.8 c	0.63 c
Ethylene thiourea (ETU)	96457	8.00E-05 i		1.19E-01 h			0.57 c	0.053 c	0.027 c	24 c	5.4 c
Ethyl p-nitrophenyl phenylphosphorothioate	2104645	1.00E-05 i					0.37 n	0.037 n	0.014 n	10 n	0.78 n
Ethylnitrosourea	759739			1.40E+02 w			0.00048 c	0.000045 c	0.000023 c	0.02 c	0.0046 c
Ethylphthalyl ethyl glycolate	84720	3.00E+00 i					110000 n	11000 n	4100 n	1000000 n	230000 n
Express	10120	8.00E-03 i					290 n	29 n	11 n	8200 n	630 n
Fenamiphos	22224926	2.50E-04 i					9.1 n	0.91 n	0.34 n	260 n	20 n
Fluometuron	2164172	1.30E-02 i					470 n	47 n	18 n	13000 n	1000 n
Fluoride	7782414	6.00E-02 i					2200 n	220 n	81 n	61000 n	4700 n
Fluoridone	59756604	8.00E-02 i					2900 n	290 n	110 n	82000 n	6300 n
Flurprimidol	56425913	2.00E-02 i					730 n	73 n	27 n	20000 n	1600 n
Flutolanil	66332965	6.00E-02 i					2200 n	220 n	81 n	61000 n	4700 n
Fluvalinate	69409945	1.00E-02 i					370 n	37 n	14 n	10000 n	780 n
Folpet	133073	1.00E-01 i		3.50E-03 i			19 c	1.8 c	0.9 c	820 c	180 c
Fomesafen	72178020			1.90E-01 i			0.35 c	0.033 c	0.017 c	15 c	3.4 c
Fonofos	944229	2.00E-03 i					73 n	7.3 n	2.7 n	2000 n	160 n
Formaldehyde	50000	2.00E-01 i			4.55E-02 i		7300 n	0.14 c	270 n	200000 n	16000 n
Formic Acid	64186	2.00E+00 h					73000 n	7300 n	2700 n	1000000 n	160000 n
Fosetyl-al	39148248	3.00E+00 i					110000 n	11000 n	4100 n	1000000 n	230000 n
Furan	110009	1.00E-03 i					37 n	3.7 n	1.4 n	1000 n	78 n
Furazolidone	67458			3.80E+00 h			0.018 c	0.0016 c	0.00083 c	0.75 c	0.17 c
Furfural	98011	3.00E-03 i	1.43E-02 e				110 n	52 n	4.1 n	3100 n	230 n
Furium	531828			5.00E+01 h			0.0013 c	0.00013 c	0.000063 c	0.057 c	0.013 c
Furmecyclox	60568050			3.00E-02 i			2.2 c	0.21 c	0.11 c	95 c	21 c
Glufosinate-ammonium	77182822	4.00E-04 i					15 n	1.5 n	0.54 n	410 n	31 n
Glycidaldehyde	765344	4.00E-04 i	2.86E-04 h				15 n	1 n	0.54 n	410 n	31 n
Glyphosate	1071836	1.00E-01 i					3700 n	370 n	140 n	100000 n	7800 n

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Haloxyfop-methyl	69806402	5.00E-05 i					1.8 n	0.18 n	0.068 n	51 n	3.9 n
Harmony	79277273	1.30E-02 i					470 n	47 n	18 n	13000 n	1000 n
HCH (alpha)	319846			6.30E+00 i	6.30E+00 i		0.011 c	0.00099 c	0.0005 c	0.45 c	0.1 c
HCH (beta)	319857			1.80E+00 i	1.80E+00 i		0.037 c	0.0035 c	0.0018 c	1.6 c	0.35 c
HCH (gamma) Lindane	58899	3.00E-04 i		1.30E+00 h			0.052 c	0.0048 c	0.0024 c	2.2 c	0.49 c
HCH-technical	608731			1.80E+00 i	1.79E+00 i		0.037 c	0.0035 c	0.0018 c	1.6 c	0.35 c
Heptachlor	76448	5.00E-04 i		4.50E+00 i	4.55E+00 i	***	0.0023 c	0.0014 c	0.0007 c	0.64 c	0.14 c
Heptachlor epoxide	1024573	1.30E-05 i		9.10E+00 i	9.10E+00 i	***	0.0012 c	0.00069 c	0.00035 c	0.31 c	0.07 c
Hexabromobenzene	87821	2.00E-03 i				***	12 n	7.3 n	2.7 n	2000 n	160 n
Hexachlorobenzene	118741	8.00E-04 i		1.60E+00 i	1.61E+00 i	***	0.0066 c	0.0039 c	0.002 c	1.8 c	0.4 c
Hexachlorobutadiene	87683	2.00E-04 h		7.80E-02 i	7.70E-02 i	***	0.14 c	0.081 c	0.04 c	37 c	8.2 c
Hexachlorocyclopentadiene	77474	7.00E-03 i	2.00E-05 h			***	0.15 n	0.073 n	9.5 n	7200 n	550 n
Hexachlorodibenzo-p-dioxin mixture	19408743			6.20E+03 i	4.55E+03 i		0.000011 c	1.40E-06 c	5.10E-07 c	0.00046 c	0.0001 c
Hexachloroethane	67721	1.00E-03 i		1.40E-02 i	1.40E-02 i	***	0.75 c	0.45 c	0.23 c	200 c	46 c
Hexachlorophene	70304	3.00E-04 i					11 n	1.1 n	0.41 n	310 n	23 n
Hexahydro-1,3,5-trinitro-1,3,5-triazine	121824	3.00E-03 i		1.10E-01 i			0.61 c	0.057 c	0.029 c	26 c	5.8 c
n-Hexane	110543	6.00E-02 h	5.71E-02 i			***	350 n	210 n	81 n	61000 n	4700 n
Hexazinone	51235042	3.30E-02 i					1200 n	120 n	45 n	34000 n	2600 n
Hydrazine, hydrazine sulfate	302012			3.00E+00 i	1.71E+01 i		0.022 c	0.00037 c	0.0011 c	0.95 c	0.21 c
Hydrogen chloride	7647010		2.00E-03 i				73 n	7.3 n			
Hydrogen sulfide	7783064	3.00E-03 i	2.57E-04 i				110 n	0.94 n	4.1 n	3100 n	230 n
Hydroquinone	123319	4.00E-02 h					1500 n	150 n	54 n	41000 n	3100 n
Imazalil	35554440	1.30E-02 i					470 n	47 n	18 n	13000 n	1000 n
Imazaquin	81335377	2.50E-01 i					9100 n	910 n	340 n	260000 n	20000 n
Iprodione	36734197	4.00E-02 i					1500 n	150 n	54 n	41000 n	3100 n
Isobutanol	78831	3.00E-01 i				***	1800 n	1100 n	410 n	310000 n	23000 n
Isophorone	78591	2.00E-01 i		9.50E-04 i			71 c	6.6 c	3.3 c	3000 c	670 c
Isopropalin	33820530	1.50E-02 i					550 n	55 n	20 n	15000 n	1200 n
Isopropyl methyl phosphonic acid	1832548	1.00E-01 i					3700 n	370 n	140 n	100000 n	7800 n
Isoxaben	82558507	5.00E-02 i					1800 n	180 n	68 n	51000 n	3900 n
Kepone	143500			1.80E+01 e			0.0037 c	0.00035 c	0.00018 c	0.16 c	0.035 c
Lactofen	77501634	2.00E-03 i					73 n	7.3 n	2.7 n	2000 n	160 n
Lead (tetraethyl)	78002	1.00E-07 i					0.0037 n	0.00037 n	0.00014 n	0.1 n	0.0078 n
Linuron	330552	2.00E-03 i					73 n	7.3 n	2.7 n	2000 n	160 n
Lithium	7439932	2.00E-02 e					730 n	73 n	27 n	20000 n	1600 n
Londax	83056996	2.00E-01 i					7300 n	730 n	270 n	200000 n	16000 n
Malathion	121755	2.00E-02 i					730 n	73 n	27 n	20000 n	1600 n
Maleic anhydride	108316	1.00E-01 i					3700 n	370 n	140 n	100000 n	7800 n
Maleic hy[illegible]ide	123[illegible]	5.00E-01 i					18000 n	1800 n	680 n	51[illegible]	39000 n
Malonon[illegible]	109773	2.00E-05 h					0.73 n	0.073 n	0.027 n	[illegible] n	1.6 n
[illegible]	8018017	3.00E-02 h					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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Manganese and compounds	7439965	5.00E-03 i	1.43e-05 i				180 n	0.052 n	6.8 n	5100 n	390 n
Mephosfolan	950107	9.00E-05 h					3.3 n	0.33 n	0.12 n	92 n	7 n
Mepiquat chloride	24307264	3.00E-02 i					1100 n	110 n	41 n	31000 n	2300 n
Mercury (inorganic)	7439976	3.00E-04 h	8.57E-05 h				11 n	0.31 n	0.41 n	310 n	23 n
Mercury (methyl)	22967926	3.00E-04 i					11 n	1.1 n	0.41 n	310 n	23 n
Merphos	150505	3.00E-05 i					1.1 n	0.11 n	0.041 n	31 n	2.3 n
Merphos oxide	78488	3.00E-05 i					1.1 n	0.11 n	0.041 n	31 n	2.3 n
Metalaxyl	57837191	6.00E-02 i					2200 n	220 n	81 n	61000 n	4700 n
Methacrylonitrile	126987	1.00E-04 i	2.00E-04 e				3.7 n	0.73 n	0.14 n	100 n	7.8 n
Methamidophos	10265926	5.00E-05 i					1.8 n	0.18 n	0.068 n	51 n	3.9 n
Methanol	67561	5.00E-01 i					18000 n	1800 n	680 n	510000 n	39000 n
Methidathion	950378	1.00E-03 i					37 n	3.7 n	1.4 n	1000 n	78 n
Methomyl	16752775	2.50E-02 i					910 n	91 n	34 n	26000 n	2000 n
Methoxychlor	72435	5.00E-03 i					180 n	18 n	6.8 n	5100 n	390 n
2-Methoxyethanol acetate	110496	2.00E-03 e					73 n	7.3 n	2.7 n	2000 n	160 n
2-Methoxyethanol	109864	1.00E-03 h	5.71E-03 i				37 n	21 n	1.4 n	1000 n	78 n
2-Methoxy-5-nitroaniline	99592			4.60E-02 h			1.5 c	0.14 c	0.069 c	62 c	14 c
Methyl acetate	79209	1.00E+00 h					37000 n	3700 n	1400 n	1000000 n	78000 n
Methyl acrylate	96333	3.00E-02 e					1100 n	110 n	41 n	31000 n	2300 n
2-Methylaniline hydrochloride	636215			1.80E-01 h			0.37 c	0.035 c	0.018 c	16 c	3.5 c
2-Methylaniline	95534			2.40E-01 h			0.28 c	0.026 c	0.013 c	12 c	2.7 c
Methyl chlorocarbonate	79221	1.00E+00 w					37000 n	3700 n	1400 n	1000000 n	78000 n
4-(2-Methyl-4-chlorophenoxy) butyric acid	94815	1.00E-02 i					370 n	37 n	14 n	10000 n	780 n
2-Methyl-4-chlorophenoxyacetic acid	94746	5.00E-04 i					18 n	1.8 n	0.68 n	510 n	39 n
2-(2-Methyl-14-chlorophenoxy)propionic acid	93652	1.00E-03 i					37 n	3.7 n	1.4 n	1000 n	78 n
Methylcyclohexane	108872		8.57E-01 h				31000 n	3100 n			
Methylene bromide	74953	1.00E-02 e				***	61 n	37 n	14 n	10000 n	780 n
Methylene chloride	75092	6.00E-02 i	8.57E-01 h	7.50E-03 i	1.64E-03 i	***	4.1 c	3.8 c	0.42 c	380 c	85 c
4,4'-Methylene bis(2-chloroaniline)	101144	7.00E-04 h		1.30E-01 h	1.30E-01 h		0.52 c	0.048 c	0.024 c	22 c	4.9 c
4,4'-Methylenebisbenzeneamine	101779			2.50E-01 w			0.27 c	0.025 c	0.013 c	11 c	2.6 c
4,4'-Methylene bis(N,N'-dimethyl)aniline	101611			4.60E-02 i			1.5 c	0.14 c	0.069 c	62 c	14 c
4,4'-Methylenediphenyl isocyanate	101688		5.71E-06 i			***	0.035 n	0.021 n			
Methyl ethyl ketone	78933	6.00E-01 i	2.86E-01 i				22000 n	1000 n	810 n	610000 n	47000 n
Methyl hydrazine	60344			1.10E+00_			0.061 e	0.0057 c	0.0029 c	2.6 c	0.58 c
Methyl isobutyl ketone	108101	8.00E-02 h	2.29E-02 e				2900 n	84 n	110 n	82000 n	6300 n
Methyl methacrylate	80626	8.00E-02 h					2900 n	290 n	110 n	82000 n	6300 n
2-Methyl-5-nitroaniline	99558			3.30E-02 h			2 c	0.19 c	0.096 c	87 c	19 c
Methyl parathion	298000	2.50E-04 i					9.1 n	0.91 n	0.34 n	260 n	20 n
2-Methylphenol (o-cresol)	95487	5.00E-02 i					1800 n	180 n	68 n	51000 n	3900 n
3-Methylphenol (m-cresol)	103394	5.00E-02 i					1800 n	180 n	68 n	51000 n	3900 n
4-Methylphenol (p-cresol)	106445	5.00E-03 h					180 n	18 n	6.8 n	5100 n	390 n
Methyl styrene (mixture)	25013154	6.00E-03 e	1.14E-02 e			***	60 n	42 n	8.1 n	6100 n	470 n

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Methyl styrene (alpha)	98839	7.00E-02 e				***	430 n	260 n	95 n	72000 n	5500 n
Methyl tertbutyl ether (MTBE)	1634044	5.00E-03 e	8.57E-01 i			***	180 n	3100 n	6.8 n	5100 n	390 n
Metolaclor (Dual)	51218452	1.50E-01 h					5500 n	550 n	200 n	150000 n	12000 n
Metribuzin	21807649	2.50E-02 i					910 n	91 n	34 n	26000 n	2000 n
Mirex	2385855	2.00E-04 i		1.80E+00 w			0.037 c	0.0035 c	0.0018 c	1.6 c	0.35 c
Molinate	2212671	2.00E-03 i					73 n	7.3 n	2.7 n	2000 n	160 n
Molybdenum	7439987	5.00E-03 i					180 n	18 n	6.8 n	5100 n	390 n
Monochloramine	10599903	1.00E-01 i					3700 n	370 n	140 n	100000 n	7800 n
Naled	300765	2.00E-03 i					73 n	7.3 n	2.7 n	2000 n	160 n
2-Naphthylamine	91598			1.30e+02 e			0.00052 c	0.000048 c	0.000024 c	0.022 c	0.0049 c
Napropamide	15299997	1.00E-01 i					3700 n	370 n	140 n	100000 n	7800 n
Nickel refinery dust					8.40E-01 i			0.0075 c			
Nickel (soluble salts)	7440020	2.00E-02 i					730 n	73 n	27 n	20000 n	1600 n
Nickel subsulfide	12035722				1.70E+00 i			0.0037 c			
Nitrapyrin	1929824	1.50E-03 w					55 n	5.5 n	2 n	1500 n	120 n
Nitrate	14797558	1.60E+00 i					58000 n	5800 n	2200 n	1000000 n	130000 n
Nitric Oxide	10102439	1.00E-01 i					3700 n	370 n	140 n	100000 n	7800 n
Nitrite	14797650	1.00E-01 i					3700 n	370 n	140 n	100000 n	7800 n
2-Nitroaniline	88744	6.00E-05 w	5.71E-05 h				2.2 n	0.21 n	0.081 n	61 n	4.7 n
3-Nitroaniline	99092	3.00E-03 o					110 n	11 n	4.1 n	3100 n	230 n
4-Nitroaniline	100016	3.00E-03 o					110 n	11 n	4.1 n	3100 n	230 n
Nitrobenzene	98953	5.00E-04 i	5.71E-04 e			***	3.4 n	2.1 n	0.68 n	510 n	39 n
Nitrofurantoin	67209	7.00E-02 h					2600 n	260 n	95 n	72000 n	5500 n
Nitrofurazone	59870			1.50E+00 h	9.40E+00 h		0.045 c	0.00067 c	0.0021 c	1.9 c	0.43 c
Nitrogen dioxide	10102440	1.00E+00 i					37000 n	3700 n	1400 n	1000000 n	78000 n
Nitroguanidine	556887	1.00E-01 i					3700 n	370 n	140 n	100000 n	7800 n
4-Nitrophenol	100027	6.20E-02 o					2300 n	230 n	84 n	63000 n	4800 n
2-Nitropropane	79469		5.71E-03 i		9.40E+00 h		210 n	0.00067 c			
N-Nitrosodi-n-butylamine	924163			5.40E+00 i	5.60E+00 i		0.012 c	0.0011 c	0.00058 c	0.53 c	0.12 c
N-Nitrosodiethanolamine	1116547			2.80E+00 i			0.024 c	0.0022 c	0.0011 c	1 c	0.23 c
N-Nitrosodiethylamine	55185			1.50E+02 i	1.51E+02 i		0.00045 c	0.000041 c	0.000021 c	0.019 c	0.0043 c
N-Nitrosodimethylamine	62759			5.10E+01 i	4.90E+01 i		0.0013 c	0.00013 c	0.000062 c	0.056 c	0.013 c
N-Nitrosodiphenylamine	86306			4.90E-03 i			14 c	1.3 c	0.64 c	580 c	130 c
N-Nitroso di-n-propylamine	621647			7.00E+00 i			0.0096 c	0.00089 c	0.00045 c	0.41 c	0.091 c
N-Nitroso-N-methylethylamine	10595956			2.20E+01 i			0.0031 c	0.00028 c	0.00014 c	0.13 c	0.029 c
N-Nitrosopyrrolidine	930552			2.10E+00 i	2.13E+00 i		0.032 c	0.0029 c	0.0015 c	1.4 c	0.3 c
m-Nitrotoluene	99081	1.00E-02 h				***	61 n	37 n	14 n	10000 n	780 n
o-Nitrotoluene	88722	1.00E-02 h				***	61 n	37 n	14 n	10000 n	780 n
p-Nitrotoluene	99990	1.00E-02 h				***	61 n	37 n	14 n	10000 n	780 n
Norflurazon	27314132	4.00E-02 i					1500 n	150 n	54 n	41000 n	3100 n
NuStar	85509199	7.00E-04 i					26 n	2.6 n	0.95 n	720 n	55 n

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Contaminant	CAS	RfDo mg/kg/d	RfDi mg/kg/d	CPSo kg·d/mg	CPSi kg·d/mg	VOC	Tap water µg/L	Ambient air µg/m3	Fish mg/kg	Industrial soil mg/kg	Residential soil mg/kg
Octahydro-1357-tetranitro-1357-tetrazocine	2691410	5.00E-02 i					1800 n	180 n	68 n	51000 n	3900 n
Octamethylpyrophosphoramide	152169	2.00E-03 h					73 n	7.3 n	2.7 n	2000 n	160 n
Oryzalin	19044883	5.00E-02 i					1800 n	180 n	68 n	51000 n	3900 n
Oxadiazon	19666309	5.00E-03 i					180 n	18 n	6.8 n	5100 n	390 n
Oxamyl	23135220	2.50E-02 i					910 n	91 n	34 n	26000 n	2000 n
Oxyfluorfen	42874033	3.00E-03 i					110 n	11 n	4.1 n	3100 n	230 n
Paclobutrazol	76738620	1.30E-02 i					470 n	47 n	18 n	13000 n	1000 n
Paraquat	1910425	4.50E-03 i					160 n	16 n	6.1 n	4600 n	350 n
Parathion	56382	6.00E-03 h					220 n	22 n	8.1 n	6100 n	470 n
Pebulate	1114712	5.00E-02 h					1800 n	180 n	68 n	51000 n	3900 n
Pendimethalin	40487421	4.00E-02 i					1500 n	150 n	54 n	41000 n	3100 n
Pentabromo-6-chloro cyclohexane	87843			2.30E-02 h			2.9 c	0.27 c	0.14 c	120 c	28 c
Pentabromodiphenyl ether	32534819	2.00E-03 i					73 n	7.3 n	2.7 n	2000 n	160 n
Pentachlorobenzene	608935	8.00E-04 i				***	4.9 n	2.9 n	1.1 n	820 n	63 n
Pentachloronitrobenzene	82688	3.00E-03 i		2.60E-01 h		***	0.041 c	0.024 c	0.012 c	11 c	2.5 c
Pentachlorophenol	87865	3.00E-02 i		1.20E-01 i			0.56 c	0.052 c	0.026 c	24 c	5.3 c
Permethrin	52645531	5.00E-02 i					1800 n	180 n	68 n	51000 n	3900 n
Phenmedipham	13684634	2.50E-01 i					9100 n	910 n	340 n	260000 n	20000 n
Phenol	108952	6.00E-01 i					22000 n	2200 n	810 n	610000 n	47000 n
m-Phenylenediamine	108452	6.00E-03 i					220 n	22 n	8.1 n	6100 n	470 n
p-Phenylenediamine	106503	1.90E-01 h					6900 n	690 n	260 n	190000 n	15000 n
Phenylmercuric acetate	62384	8.00E-05 i					2.9 n	0.29 n	0.11 n	82 n	6.3 n
2-Phenylphenol	90437			1.94E-03 h			35 c	3.2 c	1.6 c	1500 c	330 c
Phorate	298022	2.00E-04 h					7.3 n	0.73 n	0.27 n	200 n	16 n
Phosmet	732116	2.00E-02 i					730 n	73 n	27 n	20000 n	1600 n
Phosphine	7803512	3.00E-04 i	8.57E-06 h				11 n	0.031 n	0.41 n	310 n	23 n
Phosphorus (white)	7723140	2.00E-05 i					0.73 n	0.073 n	0.027 n	20 n	1.6 n
p-Phthalic acid	100210	1.00E+00 h					37000 n	3700 n	1400 n	1000000 n	78000 n
Phthalic anhydride	85449	2.00E+00 i	3.43E-01 h				73000 n	1300 n	2700 n	1000000 n	160000 n
Picloram	1918021	7.00E-02 i					2600 n	260 n	95 n	72000 n	5500 n
Pirimiphos-methyl	29232937	1.00E-02 i					370 n	37 n	14 n	10000 n	780 n
Polybrominated biphenyls		7.00E-06 h		8.90E+00 h			0.0076 c	0.0007 c	0.00035 c	0.32 c	0.072 c
Polychlorinated biphenyls (PCBs)	1336363			7.70E+00 i			0.0087 c	0.00081 c	0.00041 c	0.37 c	0.083 c
Aroclor 1016	12674112	7.00E-05 i					2.6 n	0.26 n	0.095 n	72 n	5.5 n
Polychlorinated terphenyls (PCTs)				4.50E+00 e			0.015 c	0.0014 c	0.0007 c	0.64 c	0.14 c
Polynuclear aromatic hydrocarbons											
Acenaphthene	83329	6.00E-02 i					2200 n	220 n	81 n	61000 n	4700 n
Anthracene	120127	3.00E-01 i					11000 n	1100 n	410 n	310000 n	23000 n
Benzo[a]pyrene	50328			7.30E+00 i	6.10E+00 h		0.0092 c	0.001 c	0.00043 c	0.39 c	0.088 c
Benzo[b]fluoranthene	205992			7.30E-01 e	6.10E-01 e		0.092 c	0.01 c	0.0043 c	3.9 c	0.88 c
Benzo[k]fluoranthene	207089			7.30E-02 e	6.10E-02 e		0.92 c	0.1 c	0.043 c	39 c	8.8 c
Benz[a]anthracene	56553			7.30E-01 e	6.10E-01 e		0.092 c	0.01 c	0.0043 c	3.9 c	0.88 c

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Chrysene	218019			7.30E-03 •	6.10E-03 •		9.2 c	1 c	0.43 c	390 c	88 c
Dibenz[ah]anthracene	53703			7.30E+00 •	6.10E+00 •		0.0092 c	0.001 c	0.00043 c	0.39 c	0.088 c
Fluoranthene	206440	4.00E-02 i					1500 n	150 n	54 n	41000 n	3100 n
Fluorene	86737	4.00E-02 i					1500 n	150 n	54 n	41000 n	3100 n
Indeno[1,2,3-cd]pyrene	193395			7.30E-01 •	6.10E-01 •		0.092 c	0.01 c	0.0043 c	3.9 c	0.88 c
Naphthalene	91203	4.00E-02 w					1500 n	150 n	54 n	41000 n	3100 n
Pyrene	129000	3.00E-02 i					1100 n	110 n	41 n	31000 n	2300 n
Prochloraz	67747095	9.00E-03 i		1.50E-01 i			0.45 c	0.042 c	0.021 c	19 c	4.3 c
Profluralin	26399360	6.00E-03 h					220 n	22 n	8.1 n	6100 n	470 n
Prometon	1610180	1.50E-02 i					550 n	55 n	20 n	15000 n	1200 n
Prometryn	7287196	4.00E-03 i					150 n	15 n	5.4 n	4100 n	310 n
Pronamide	23950585	7.50E-02 i					2700 n	270 n	100 n	77000 n	5900 n
Propachlor	1918167	1.30E-02 i					470 n	47 n	18 n	13000 n	1000 n
Propanil	709988	5.00E-03 i					180 n	18 n	6.8 n	5100 n	390 n
Propargite	2312358	2.00E-02 i					730 n	73 n	27 n	20000 n	1600 n
Propargyl alcohol	107197	2.00E-03 i					73 n	7.3 n	2.7 n	2000 n	160 n
Propazine	139402	2.00E-02 i					730 n	73 n	27 n	20000 n	1600 n
Propham	122429	2.00E-02 i					730 n	73 n	27 n	20000 n	1600 n
Propiconazole	60207901	1.30E-02 i					470 n	47 n	18 n	13000 n	1000 n
Propylene glycol	57556	2.00E+01 h					730000 n	73000 n	27000 n	1000000 n	1000000 n
Propylene glycol, monoethyl ether	52125538	7.00E-01 h					26000 n	2600 n	950 n	720000 n	55000 n
Propylene glycol, monomethyl ether	107982	7.00E-01 h	5.71E-01 i				26000 n	2100 n	950 n	720000 n	55000 n
Propylene oxide	75569		8.57E-03 i	2.40E-01 i	1.29E-02 i		0.28 c	0.49 c	0.013 c	12 c	2.7 c
Pursuit	81335775	2.50E-01 i					9100 n	910 n	340 n	260000 n	20000 n
Pydrin	51630581	2.50E-02 i					910 n	91 n	34 n	26000 n	2000 n
Pyridine	110861	1.00E-03 i					37 n	3.7 n	1.4 n	1000 n	78 n
Quinalphos	13593038	5.00E-04 i					18 n	1.8 n	0.68 n	510 n	39 n
Quinoline	91225			1.20E+01 h			0.0056 c	0.00052 c	0.00026 c	0.24 c	0.053 c
Resmethrin	10463862	3.00E-02 i					1100 n	110 n	41 n	31000 n	2300 n
Rotenel	299843	5.00E-02 h					1800 n	180 n	68 n	51000 n	3900 n
Rotenone	83794	4.00E-03 i					150 n	15 n	5.4 n	4100 n	310 n
Savey	78587050	2.50E-02 i					910 n	91 n	34 n	26000 n	2000 n
Selenious Acid	7783008	5.00E-03 i					180 n	18 n	6.8 n	5100 n	390 n
Selenium	7782492	5.00E-03 i					180 n	18 n	6.8 n	5100 n	390 n
Selenourea	630104	5.00E-03 h					180 n	18 n	6.8 n	5100 n	390 n
Sethoxydim	74051802	9.00E-02 i					3300 n	330 n	120 n	92000 n	7000 n
Silver and compounds	7440224	5.00E-03 i					180 n	18 n	6.8 n	5100 n	390 n
Simazine	122349	5.00E-03 i		1.20E-01 h			0.56 c	0.052 c	0.026 c	24 c	5.3 c
Sodium a[illegible]	26628228	4.00E-03 i					150 n	15 n	5.4 n	4[illegible]	310 n
Sodium d[illegible]dithiocarbamate	148185	3.00E-02 i		2.70E-01 h			0.25 c	0.023 c	0.012 c	[illegible]	2.4 c

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Strontium, stable	7440246	6.00E-01 i					22000 n	2200 n	810 n	610000 n	47000 n
Strychnine	57249	3.00E-04 i					11 n	1.1 n	0.41 n	310 n	23 n
Styrene	100425	2.00E-01 i	2.86E-01 i			***	1600 n	1000 n	270 n	200000 n	16000 n
Systhane	88671890	2.50E-02 i					910 n	91 n	34 n	26000 n	2000 n
2,3,7,8-TCDD (dioxin)	1746016			1.56E+05 h	1.16E+05 h		4.30E-07 c	5.40E-08 c	2.00E-08 c	0.000018 c	4.10E-06 c
Tebuthiuron	34014181	7.00E-02 i					2600 n	260 n	95 n	72000 n	5500 n
Temephos	3383968	2.00E-02 h					730 n	73 n	27 n	20000 n	1600 n
Terbacil	5902512	1.30E-02 i					470 n	47 n	18 n	13000 n	1000 n
Terbufos	13071799	2.50E-05 h					0.91 n	0.091 n	0.034 n	26 n	2 n
Terbutryn	886500	1.00E-03 i					37 n	3.7 n	1.4 n	1000 n	78 n
1,2,4,5-Tetrachlorobenzene	95943	3.00E-04 i				***	1.8 n	1.1 n	0.41 n	310 n	23 n
1,1,1,2-Tetrachloroethane	630206	3.00E-02 i		2.60E-02 i	2.59E-02 i	***	0.41 c	0.24 c	0.12 c	110 c	25 c
1,1,2,2-Tetrachloroethane	79345			2.00E-01 i	2.03E-01 i	***	0.052 c	0.031 c	0.016 c	14 c	3.2 c
Tetrachloroethylene (PCE)	127184	1.00E-02 i		5.20E-02 o	2.03E-03 o	***	1.1 c	3.1 c	0.061 c	55 c	12 c
2,3,4,6-Tetrachlorophenol	58902	3.00E-02 i					1100 n	110 n	41 n	31000 n	2300 n
p,a,a,a-Tetrachlorotoluene	5216251			2.00E+01 h		***	0.00053 c	0.00031 c	0.00016 c	0.14 c	0.032 c
Tetrachlorovinphos	961115	3.00E-02 i		2.40E-02 h			2.8 c	0.26 c	0.13 c	120 c	27 c
Tetraethyldithiopyrophosphate	3689245	5.00E-04 i					18 n	1.8 n	0.68 n	510 n	39 n
Thallic oxide	1314325	7.00E-05 w					2.6 n	0.26 n	0.095 n	72 n	5.5 n
Thallium											
Thallium acetate	563688	9.00E-05 i					3.3 n	0.33 n	0.12 n	92 n	7 n
Thallium carbonate	6533739	8.00E-05 i					2.9 n	0.29 n	0.11 n	82 n	6.3 n
Thallium chloride	7791120	8.00E-05 i					2.9 n	0.29 n	0.11 n	82 n	6.3 n
Thallium nitrate	10102451	9.00E-05 i					3.3 n	0.33 n	0.12 n	92 n	7 n
Thallium selenite	12039520	9.00E-05 w					3.3 n	0.33 n	0.12 n	92 n	7 n
Thallium sulfate	7446186	8.00E-05 i					2.9 n	0.29 n	0.11 n	82 n	6.3 n
Thiobencarb	28249776	1.00E-02 i					370 n	37 n	14 n	10000 n	780 n
2-(Thiocyanomethylthio)-benzothiazole	21564170	3.00E-02 h					1100 n	110 n	41 n	31000 n	2300 n
Thiofanox	39196184	3.00E-04 h					11 n	1.1 n	0.41 n	310 n	23 n
Thiophanate-methyl	23564058	8.00E-02 i					2900 n	290 n	110 n	82000 n	6300 n
Thiram	137268	5.00E-03 i					180 n	18 n	6.8 n	5100 n	390 n
Tin and compounds		6.00E-01 h					22000 n	2200 n	810 n	610000 n	47000 n
Toluene	108883	2.00E-01 i	1.14E-01 w			***	750 n	420 n	270 n	200000 n	16000 n
Toluene-2,4-diamine	95807			3.20E+00 h			0.021 c	0.002 c	0.00099 c	0.89 c	0.2 c
Toluene-2,5-diamine	95705	6.00E-01 h					22000 n	2200 n	810 n	610000 n	47000 n
Toluene-2,6-diamine	823405	2.00E-01 h					7300 n	730 n	270 n	200000 n	16000 n
p-Toluidine	106490			1.90E-01 h			0.35 c	0.033 c	0.017 c	15 c	3.4 c
Toxaphene	8001352			1.10E+00 i	1.12E+00 i		0.061 c	0.0056 c	0.0029 c	2.6 c	0.58 c
Tralomethrin	66841256	7.50E-03 i					270 n	27 n	10 n	7700 n	590 n
Triallate	2303175	1.30E-02 i					470 n	47 n	18 n	13000 n	1000 n
Triasulfuron	82097505	1.00E-02 i					370 n	37 n	14 n	10000 n	780 n
1,2,4-Tribromobenzene	615543	5.00E-03 i				***	30 n	18 n	6.8 n	5100 n	390 n

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Tributyltin oxide (TBTO)	56359	3.00E-05 i					1.1 n	0.11 n	0.041 n	31 n	2.3 n
2,4,6-Trichloroaniline hydrochloride	33663502			2.90E-02 h			2.3 c	0.22 c	0.11 c	99 c	22 c
2,4,6-Trichloroaniline	634935			3.40E-02 h			2 c	0.18 c	0.093 c	84 c	19 c
1,2,4-Trichlorobenzene	120821	1.00E-02 i	5.71e-02 h			•••	190 n	210 n	14 n	10000 n	780 n
1,1,1-Trichloroethane	71556	9.00E-02 w	2.86E-01 w			•••	1300 n	1000 n	120 n	92000 n	7000 n
1,1,2-Trichloroethane	79005	4.00E-03 i		5.70E-02 i	5.60E-02 i	•••	0.19 c	0.11 c	0.055 c	50 c	11 c
Trichloroethylene (TCE)	79016	6.00E-03 e		1.10E-02 w	6.00E-03 e	•••	1.6 c	1 c	0.29 c	260 c	58 c
Trichlorofluoromethane	75694	3.00E-01 i	2.00E-01 e			•••	1300 n	730 n	410 n	310000 n	23000 n
2,4,5-Trichlorophenol	95954	1.00E-01 i					3700 n	370 n	140 n	100000 n	7800 n
2,4,6-Trichlorophenol	88062			1.10E-02 i	1.09E-02 i		6.1 c	0.57 c	0.29 c	260 c	58 c
2,4,5-Trichlorophenoxyacetic acid	93765	1.00E-02 i					370 n	37 n	14 n	10000 n	780 n
2-(2,4,5-Trichlorophenoxy)propionic acid	93721	8.00E-03 i					290 n	29 n	11 n	8200 n	630 n
1,1,2-Trichloropropane	598776	5.00E-03 i				•••	30 n	18 n	6.8 n	5100 n	390 n
1,2,3-Trichloropropane	96184	6.00E-03 i		7.00e+00 i		•••	0.0015 c	0.00089 c	0.00045 c	0.41 c	0.091 c
1,2,3-Trichloropropene	96195	5.00E-03 h				•••	30 n	18 n	6.8 n	5100 n	390 n
1,1,2-Trichloro-1,2,2- trifluoroethane	76131	3.00E+01 i	8.57E+00 h			•••	59000 n	31000 n	41000 n	1000000 n	1000000 n
Tridiphane	58138082	3.00E-03 i					110 n	11 n	4.1 n	3100 n	230 n
Triethylamine	121448		2.00E-03 i				73 n	7.3 n			
Trifluralin	1582098	7.50E-03 i		7.70E-03 i			8.7 c	0.81 c	0.41 c	370 c	83 c
1,2,4-Trimethylbenzene	95636	5.00e-04 e				•••	3 n	1.8 n	0.68 n	510 n	39 n
1,3,5-Trimethylbenzene	108678	4.00e-04 e				•••	2.4 n	1.5 n	0.54 n	410 n	31 n
Trimethyl phosphate	512561			3.70E-02 h			1.8 c	0.17 c	0.085 c	77 c	17 c
1,3,5-Trinitrobenzene	99354	5.00E-05 i					1.8 n	0.18 n	0.068 n	51 n	3.9 n
Trinitrophenylmethylnitramine	479458	1.00E-02 h					370 n	37 n	14 n	10000 n	780 n
2,4,6-Trinitrotoluene	118967	5.00E-04 i		3.00E-02 i			2.2 c	0.21 c	0.11 c	95 c	21 c
Uranium (soluble salts)	7440611	3.00E-03 i					110 n	11 n	4.1 n	3100 n	230 n
Vanadium	7440622	7.00E-03 h					260 n	26 n	9.5 n	7200 n	550 n
Vanadium pentoxide	1314621	9.00E-03 i					330 n	33 n	12 n	9200 n	700 n
Vanadium sulfate	36907423	2.00E-02 h					730 n	73 n	27 n	20000 n	1600 n
Vernam	1929777	1.00E-03 i					37 n	3.7 n	1.4 n	1000 n	78 n
Vinclozolin	50471448	2.50E-02 i					910 n	91 n	34 n	26000 n	2000 n
Vinyl acetate	108054	1.00E+00 h	5.71E-02 i				37000 n	210 n	1400 n	1000000 n	78000 n
Vinyl bromide	593602		8.57E-04 i			•••	5.2 n	3.1 n			
Vinyl chloride	75014			1.90E+00 h	3.00E-01 h	•••	0.019 c	0.021 c	0.0017 c	1.5 c	0.34 c
Warfarin	81812	3.00E-04 i					11 n	1.1 n	0.41 n	310 n	23 n
m-Xylene	108323	2.00E+00 h	2.00E-01 w			•••	1400 n	730 n	2700 n	1000000 n	160000 n
o-Xylene	95476	2.00E+00 h	2.00E-01 w			•••	1400 n	730 n	2700 n	1000000 n	160000 n
p-Xylene	106423		8.57E-02 w			•••	520 n	310 n			
Xylene (mixed)	1330207	2.00E+00 i				•••	12000 n	7300 n	2700 n	1000000 n	160000 n
Zinc	7440666	3.00E-01 i					11000 n	1100 n	410 n	310000 n	23000 n
Zinc phosphide	1314847	3.00E-04 i					11 n	1.1 n	0.41 n	310 n	23 n
Zineb	12122677	5.00E-02 i					1800 n	180 n	68 n	51[illegible]	3900 n

Appendix B

Data Qualifiers Summary

NAS MEMPHIS DATA QUALIFIERS

UNVALIDATED	VALIDATED[1]
INORGANIC	
U Analyte was not detected. The result is less than the Instrument Detection Limit (IDL).	Qualifier will remain; the analyte is undetected.
NA	J Estimated value because one or more quality control criterion were not met.
B The result is less than the reporting limit but greater than the IDL.	Qualifier will be changed to "J."
N Spike recovery was not within the method-specified control limits.	Qualifiers will most likely be changed to "J." In extreme cases, the result could be rejected and flagged "R."
* Laboratory duplicate was not within the method-specified control limits.	Most qualifiers will be changed to "J." Some "*" will be discarded.
E The ICP serial dilution was not within the method-specified control limits. The reported value is estimated because of suspected interference.	Qualifiers will most likely be changed to "J." In extreme cases, the result could be rejected and flagged "R."
M Duplicate injection precision not met. (Furnace AA only).	Qualifiers will most likely be changed to "J."
S The value was determined by the Method of Standard Additions (Furnace AA only).	"S" qualifier will be removed. This is an acceptable value.
W Postdigested spike for Furnace AA is out of control and the sample absorbance is less than 50%.	Qualifiers will most likely be changed to "J." In extreme cases, the result could be rejected and flagged "R."
+ The value determined by the Method of Standard Additions had a correlation coefficient less than 0.995.	Qualifier will most likely be changed to "J".

[1] This column presents a general guideline for what the validation flag might be as a result of the lab's flag. Most of the time, the lab's qualifiers are changed to a "J" because of the lab's review criteria. Sometimes the lab qualifiers are discarded all together because of the validation criteria is different.

UNVALIDATED	VALIDATED
ORGANIC	
U Compound was analyzed for but not detected. The "U" flag is the detection limit for that compound.	Qualifier will remain; the analyte was undetected.
J Compound was detected below the method reporting limit.	J Compound was detected below the method reporting limits OR Estimated value because one or more quality control criterion were not met
B Compound was found in the associated lab blank as well as the sample.	"B" flag will be removed. Blanks will be assessed. If the concentration in the sample is less than 10X the amount in the associated sample for common lab contaminants (of less than 5X for non common lab contaminants), the result will be negated and flagged "U." If the concentration is greater than 10X (or 5X), the concentration will remain unqualified.
E The compound exceeded the calibration range.	If the lab did not dilute the sample, the result will be changed to "J."
D The value was obtained during a secondary dilution.	The "D" flag will remain to alert the data user that the value from a secondary dilution was used.
P PEST/PCB is analyzed using two GC columns. This flag is applied when the difference between the values of the two columns differs by more than 25%.	Qualifiers will most likely be changed to "J."
Y (NET SPECIFIC QUALIFIER). The compound was manually integrated by the analyst.	Qualifiers will most likely be deleted.

[2] This column presents a general guideline for what the validation flag might be as a result of the lab's flag. Most of the time, the lab's qualifiers are changed to a "J" because of the lab's review criteria. Sometimes the lab qualifiers are discarded all together because of the validation criteria is different.

1.0 INTRODUCTION

This report presents the analytical data collected during the NAS Memphis Gray Area and Solid Waste Management Unit (SWMU) 45 sites and the quality assurance/quality control (QA/QC) evaluation of those data. The purpose of the data evaluation is to verify that the QC requirements of the data set have been met and to characterize the weakness of questionable data.

Soil samples were collected at NAS Memphis site during November and December 1994. Most were analyzed by National Environmental Testing, Inc. (NET) Laboratory in Cambridge, Massachusetts and were reported using USEPA Data Quality Objectives (DQO) Level IV. Ten soil samples were also analyzed by Quanterra Environmental Services (Quanterra) for waste characterization using USEPA DQO Level III. The analytical methods and DQO laboratory deliverables are summarized on Table 1-1.

Table B1-1
NAS Memphis Analytical Program

Analytical Method	Data Quality Level	Method Reference	Site
Full Scan			
Volatile Organic Compounds (VOCs)	IV	SW-846 8240	Gray Area SWMU 45
Semivolatile Organic Compounds (SVOCs)	IV	SW-846 8270	
Pesticides/Polychlorinated Biphenyls (Pest/PCBs)	IV	SW-846 8080	
Chlorinated Herbicides	IV	SW-846 8150	
Organophosphorus Pesticides	IV	SW-846 8140	
Total Petroleum Hydrocarbons (TPH)	III	USEPA 418.1	
Metals	IV	40 CFR Part 264 Appendix IX (SW-846 6010/7060/7421/7471/7740/7740)	
Waste Characterization			
TCLP VOCs, SVOCs, Lead	III	SW-846 1311/8240/8270/6010	SWMU 45
Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)	III	Modified 8015/TN GRO, 8020	
Gasoline Range Organics (GRO)	III	Modified 8015/TN GRO, 8020	
Diesel Range Organics (DRO)	III	Modified 8015/TN DRO	

The references for the methods listed in Table 1-1 were obtained from the following sources:

- USEPA Office of Solid Waste and Emergency Response (OSWER), *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846), 3rd Edition, revised July 1992.

- USEPA Environmental Monitoring and Support Laboratory, *Methods for Chemical Analysis of Water and Wastes* (EPA-600/4-79-020, revised March 1983).

- USEPA *40 Code of Federal Regulations Part 264, Appendix IX* [*52 Federal Register 25947,* July 1987]

The following sections discuss the data validation findings with respect to each individual sample delivery group (SDG). The individual SDGs usually contain samples of one matrix type, i.e., either a soil or groundwater samples, except for the QC samples. The following outlines the SDGs for this project and the analytical parameters associated with each SDG.

Data Validation Summary of the Soil Samples:

Section 2.0	Organic and Metals Data	NET SDG 1263
Section 3.0	Organic, Metals and TPH Data	NET SDG 1264
Section 4.0	Organic and TPH Data	NET SDG 1265
Section 5.0	Organic and TPH Data	NET SDG 1266
Section 6.0	Resampled Herbicide Data	NET SDG 1288
Section 7.0	TCLP VOCs, SVOCs and Metals Data	NET SDG 03876
Section 8.0	BTEX, GRO and DRO Data	Quanterra SDG 2295/2277

1.1 Organic Evaluation Criteria

The USEPA methods described in *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, and *Methods for Chemical Analysis of Water and Wastes*, define quality control criteria that the laboratory must meet but the methods do not address data evaluation from a user's perspective. Evaluation criteria are available in *USEPA Contract Laboratory National Functional Guidelines for Organic Data Review* (Functional Guidelines), February 1994. Functional Guidelines was used throughout the data evaluation process when the analytical methods did not address data usability.

Data evaluation for samples collected at NAS Memphis included the following parameters:

- Holding times
- GC/MS instrument performance checks
- Surrogate spike recoveries
- Instrument calibration

- Matrix spike and matrix spike duplicates (MS/MSD)
- Blank analysis
- Internal standard performance
- Compound quantitation
- Field duplicate precision

According to Functional Guidelines, when the QC parameters do not fall within the specific method guidelines, the data evaluator annotates or "flags" the corresponding compounds where deficiencies were found. The data from the NAS Memphis site were evaluated using this approach. The following flags were used to annotate data exhibiting laboratory and/or field deficiencies or problems:

U **Undetected** — The analyte was analyzed for but not detected or was also found in an associated blank, but at a concentration less than 10 times the blank concentration for common constituents or five times the blank concentration for other constituents; the associated value shown is the quantitation limit.

J **Estimated Value** — One or more QC parameters were outside control limits.

UJ **Undetected and Estimated** — The analyte was analyzed for but not detected above the listed estimated quantitation limit; the quantitation limit is estimated because one or more QC parameters was outside control limits.

D **Diluted Result** — The compound was re-analyzed at a secondary dilution factor. If one or more compounds are outside the calibration range during an initial analysis, the laboratory flags the analyte "E." When diluted, the sample results will be flagged "D." Generally, values from the initial analysis will be used except where the value exceeded the calibration range. Values exceeding the calibration range in the initial analysis will be substituted by the diluted value to ensure the most representative data. The "D" flag will remain on the value to alert the data user that the value from a secondary dilution was used.

R/UR **Unusable Data** — One or more QC parameters grossly exceeded control limits.

These validation flags were applied to data where data deficiencies were noted. Attachment A includes tables of all qualified data.

1.1.1 Holding Times

Acceptable technical holding times are specified in the analytical methods. The sample holding time depends on the type of analysis and whether the sample was preserved. For water samples, the holding time for preserved VOC and GRO analysis is 14 days from the collection date.

SVOCs, pesticides/PCBs, organophosphorus pesticides, and chlorinated herbicides water samples must be extracted within seven days (14 days for DRO) and analyzed within 40 days after extraction. Holding times for soil matrices are not specified in SW-846. Therefore, it is at the discretion of the data reviewer to apply the water sample holding times criteria to soil.

Holding times for total petroleum hydrocarbons (by USEPA method 418.1) are 28 days from the day of collection for water samples that are preserved and refrigerated. No holding times are cited for soil samples; therefore, it is at the discretion of the data reviewer to apply the water sample holding times criteria to soil.

1.1.2 GC/MS Instrument Performance Checks

Performance standards for VOC and SVOC analyses are analyzed to determine if the data produced by the instrument may be correctly interpreted according to the requirements of the method being used. Performance standards must be analyzed within 12 hours of sample analysis, and the results must be within the established criteria.

1.1.3 Surrogate Spike Recoveries

Surrogate compounds are added to samples and laboratory blanks before extraction and sample preparation to evaluate the effect of the sample matrix on extraction and measurement procedures. Surrogates are organic compounds which are chemically similar to analytes of interest but not normally found in environmental samples. Three surrogate compounds are added to samples for VOC analysis, eight are added to samples for SVOC analysis, two are added to pesticide/PCB samples, and one is added to both organophosphorus pesticides and chlorinated herbicides. Percent recovery of the surrogates is calculated by comparing the amount of the compound recovered by the analysis to the amount added to the sample.

Below is a list of surrogate compounds recommended by the SW-846 methods. Abbreviations for each compound are in parentheses (when applicable).

VOC Surrogates	SVOC Surrogates	Pesticide/PCB Surrogates	Herbicide Surrogate	Organophosphorus Pesticide Surrogate
Toluene-d8 (TOL)	Nitrobenzene-d5 (NBZ)	Tetrachloro-m-xylene (TCMX)	DCAA	4-Chloro-3-Nitrobenzotrifluoride (CNBT)
Bromofluorobenzene (BFB)	2-Fluorobiphenyl (FBP)	Decachlorobiphenyl (DCB)		
1,2-Dichloroethane (DCE)	Terphenyl-d14 (TPH)			
	2,4,6-Tribromophenol (TBP)			
	Phenol-d5 (PHL)			
	2-Chlorophenol-d4 (2CP)			
	1,2-Dichlorobenzene-d4 (DCB)			

1.1.4 Instrument Calibration

Instruments are initially and continually calibrated with standard solutions to verify that they are capable of producing acceptable quantitative data for the compounds.

Initial calibration (GC/MS): The instrument is initially calibrated at the beginning of the analytical run to check its performance and to establish a linear 5-point calibration curve. The initial calibration is verified by calculating the relative response factor (RRF) and the percent relative standard deviation (%RSD) for each compound. An RRF less than 0.05 or a %RSD greater than 30% is outside the QC limits for the initial calibration.

Continuing calibration (GC/MS): Standard solutions are run periodically to check the daily performance of the instrument and to establish the 12-hour RRF on which the sample quantitations are based. The continuing calibration is verified by calculating the RRF and the percent difference (%D) for each compound. An RRF less than 0.05 or a %D greater than 25% is outside the QC limits for the continuing calibration.

Initial calibration (GC): For single-component pesticides, two separate standard mixes are used, five-point calibrations are analyzed, and calibration factors (CF) are established. The CF for single-component pesticides must be less than or equal to 20%.

The multi-component pesticide toxaphene and all PCBs (or Arochlors) are analyzed separately. Retention times and CFs are determined for three to five primary peaks. The only review criteria for multi-component compounds is to verify these steps were taken.

A five-point initial calibration is analyzed for BTEX, GRO, DRO, herbicides, organophosphorus pesticides and TPH. Two methods for calibration may be used: external or linear regression methods. For the external method, the initial calibration may be verified by calculating the RRF and the percent relative standard deviation (%RSD) for each compound. An RRF less than 0.05 or a %RSD greater than 20% is outside the QC limits for the initial calibration. If linear regression is used, the correlation coefficient must meet or exceed 0.995 before analysis of the samples can begin.

Continuing calibration (GC): To confirm the calibration and evaluate instrument performance for single-component pesticides, calibration verification consisting of instrument blank, performance evaluation mixtures (PEM), and the midpoint concentration of the two standard mixes are analyzed. The %D between the calculated amount and the true amount must not exceed 15% on the primary column.

Multi-component compounds do not require continuing calibration.

For BTEX, GRO, DRO, herbicides, and organophosphorus pesticides, the continuing calibration is verified by calculating the RRF and the percent difference (%D) for each compound. An RRF less than 0.05% or a %D greater than 15% is outside the QC limits for the continuing calibration.

For NAS Memphis, only positive results were flagged when the %RSDs and %D were outside control limits but were less than 50%. If the %RSD or %D exceeded 50%, both the positive and nondetected results were flagged. Based on professional judgement, the results were flagged in this manner because the risk would be in reporting results with a high bias rather than a low bias.

1.1.5 MS/MSD

A matrix spike is used to determine the accuracy of the analysis for a given matrix. A matrix spike consists of a known quantity of stock solution added to the sample before its preparation and analysis. Evaluating the matrix spike data involves two calculations. First, the percent recovery (%R) is calculated by comparing the amount of the compound recovered by the analysis to the amount added to the sample. In addition, the relative percent difference (RPD) between the MS and the MSD samples is calculated and assessed. No specific requirements have been established for qualifying MS/MSD data. However, guidelines to aid in applying professional judgment are discussed in Functional Guidelines.

1.1.6 Laboratory Control Samples (LSC) and Laboratory Duplicates

Total petroleum hydrocarbons and other GC methods may require that a LCS and laboratory duplicate be performed with each SDG. The LCS monitors the of the overall performance of each step during analysis, including sample preparation. All aqueous LCS percent recovery results must fall within the control limits established by the laboratory. Laboratory duplicate samples are used to demonstrate acceptable method precision at the time of analysis. The RPD between the sample and the duplicate sample is calculated. Although no guidelines are established for organic laboratory duplicates, sample qualification is left up to professional judgement.

1.1.7 Blank Analysis

Laboratory method blanks are used to assess the existence and magnitude of potential contamination introduced during analysis. Additionally, *field blanks* may be collected to assess any contamination introduced while collecting samples. When chemicals are found both in samples and laboratory blanks analyzed within the same 12-hour period <u>and/or</u> field-derived blanks, the usability of the data depends on the reviewer's judgment and the blank's origin. According to Functional Guidelines, a sample result should not be considered positive unless the concentration of the compound in the sample exceeds 10 times the amount in <u>any</u> blank for

common laboratory contaminants (i.e., methylene chloride, acetone, 2-butanone, and phthalate esters), or five times the amount for other constituents. These are referred to as *action levels*. Because blank samples may not be prepared using the same weight of sample, volume of sample, or dilution, these factors should be also taken into consideration when using these blank criteria. The specific actions to be taken are as follows:

- If a chemical is found in the blank but not the sample, no action is taken.
- If the sample concentration is less than the quantitation limit and less than the action level the quantitation limit is reported.
- If the sample concentration is between the quantitation limit and the action level, the concentration is reported as nondetect "U."
- If the sample concentration is greater than the action level, the concentration may be used unqualified.

Field-Derived Blanks

For this project, three types of field-derived blanks were collected: the *field blank*, the *equipment rinsate blank* (also called a *rinsate blank*), and the *trip blank*. The field blank is a sample of the source water used onsite, primarily to decontaminate equipment. The equipment rinsate blank is a sample of runoff water from one or more pieces of the decontaminated equipment used to collect samples. The trip blank is a 40-milliliter (ml) volatile organic analysis (VOA) vial filled with certifiable water used to assess cross-contamination during VOC sample shipment.

The frequencies for collecting these QC samples were defined in Section 4 of the *NAS Memphis Comprehensive RFI Work Plan* as follows:

- *Field blanks* — one source water per sampling event.
- *Rinsate blank* — one per sampling event.
- *Trip blank* — one per shipment containing samples for VOAs.

For data validation purposes, each trip blank is associated only with the samples from the same shipment/cooler. The field blanks and the rinsate blanks apply to a larger amount of samples because only one is collected per sampling event. Because field-derived blanks are used with method blanks to assess potential cross-contamination of field investigative samples, no action was taken if contamination was detected in the method blanks associated with the field-derived blanks.

1.1.8 Internal Standard Performance

GC/MS internal standards (IS) are added to samples to check the stability of the instrument's sensitivity and response during each analytical VOC and SVOC run. IS area counts for samples and blanks must not vary more than a factor of two (-50% to +100%) from the associated calibration standard. If an IS area count is outside this window, action should be taken.

Listed below are the internal standard compounds recommended by the methods. Abbreviations for each compound are in parentheses.

VOC IS Compounds	**SVOC IS Compounds**
Bromochloromethane (BCM)	1,4-Dichlorobenzene-d4 (DCB)
1,4-Difluorobenzene (DFB)	Naphthalene-d8 (NPT)
Chlorobenzene-d5 (CBZ)	Acenaphthene-d10 (ANT)
	Phenanthrene-d10 (PHN)
	Chrysene-d12 (CRY)
	Perylene-d12 (PRY)

1.2 Inorganic Evaluation Criteria

The USEPA methods described in *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, and *40 Code of Federal Regulations Part 264, Appendix IX* define quality control criteria that the laboratory must meet but the methods do not address data evaluation from a user's perspective. Evaluation criteria are available in *USEPA Contract Laboratory National Functional Guidelines for Inorganic Data Review* (Functional Guidelines), February 1994. Functional Guidelines was used throughout the data evaluation process when the analytical methods did not address data usability.

Data evaluation for samples collected at NAS Memphis included the following parameters:

- Holding times
- Instrument calibration
- Matrix spike results (MS)
- Laboratory duplicates
- Blank analysis
- ICP interference check samples
- ICP serial dilutions
- Laboratory control sample (LCS) results
- Atomic Absorption (AA) duplicate injections and post-digestion spike recoveries
- Field duplicate precision

According to Functional Guidelines, when the QC parameters do not fall within the specific method guidelines, the data evaluator annotates or "flags" the corresponding compounds where deficiencies were found. The data from the NAS Memphis site were evaluated using this approach. The following flags were used to annotate data exhibiting laboratory and/or field deficiencies or problems:

U **Undetected** — The analyte was analyzed for but not detected above the instrument detection limit (IDL) or was also found in an associated blank at a concentration less than 5 times the blank concentration.

J **Estimated Value** — One or more QC parameters were outside control limits.

UJ **Undetected and Estimated** — The analyte was analyzed for but not detected above the listed estimated IDL; the IDL is estimated because one or more QC parameters was outside control limits.

R/UR **Unusable Data** — One or more QC parameters grossly exceeded control limits.

1.2.1 Holding Times

Acceptable technical holding times are specified in the analytical methods. For aqueous samples, the holding time for metals analysis is six months, except for mercury, which is 28 days from the date of collection. For aqueous samples, cyanide analysis has a sample holding time of 14 days from the date of collection. Holding times for soil matrices are not specified in the methods. Therefore, it is at the discretion of the data reviewer to apply the water sample holding times criteria to soil.

1.2.2 Instrument Calibration

Initial and continuing calibrations of the instruments with standard solutions are used to check that the instrument is capable of producing acceptable qualitative and quantitative data for the analytes on the Appendix IX List.

An initial calibration is performed to check the performance of the instrument at the beginning of the analytical run and to establish a linear calibration curve. Calibration standard solutions are run periodically to check the performance of the instrument and confirm that the initial calibration curve is still valid. Calibrations are verified by calculating the percent recovery (%R) and comparing the amount of the analyte recovered by analysis to the known amount of standard. The %R for metals, with the exception of mercury and cyanide, should fall between 90 and 110 percent. The %R for mercury and cyanide should fall between 80 and 120 percent and 85 and 115 percent, respectively.

1.2.3 Blank Analysis

Laboratory method blanks are used to assess the existence and magnitude of potential contamination introduced during analysis. Additionally, *field blanks* may be collected to assess the potential contamination introduced during sample collection. When chemicals are found in samples and laboratory blanks, the usability of the data depends on the judgment of the reviewer and the origin of the blank. According to Functional Guidelines, a sample result should not be considered positive unless the concentration of the compound in the sample exceeds 5 times the amount in any blank. These are referred to as *action levels*. Because blank samples may not be prepared using the same weight of sample, volume of sample, or dilution, these factors should be also taken into consideration when using these blank criteria. The specific actions to be taken are as follows:

- If a chemical is found in the blank but not the sample, no action is taken.
- If the sample concentration is between the IDL, and less than five times the amount found in any blank, the concentration is reported as "U."
- If the sample concentration is greater than 5 times the amount in any blank, the concentration may be used unqualified.

1.2.4 ICP Interference Check Samples

The Inductively Coupled Plasma (ICP) interference check sample is used to confirm the laboratory instrument's inter-element and background correction factors. Interference samples should be run at the beginning and end of each sample analysis run or at least twice per eight-hour working shift. The percent recoveries for the interference check sample should fall between 80 and 120 percent.

1.2.5 Laboratory Control Samples

Laboratory control samples are used to monitor the overall performance of steps in the analysis, including the sample preparation. All aqueous LCS percent recovery results must fall within the control limits of 80 to 120 percent, except for antimony and silver for which control limits have not been established. Soil LCS standards are generally provided by the USEPA (or state agency or private laboratory). Control limits are established for each soil LCS standard prepared.

1.2.6 Spike Sample Analysis

Samples are spiked with known quantities of analytes to evaluate the effect of the sample matrix on digestion and measurement procedures. The %R should be within 75 to 125 percent.

However, when the sample concentration exceeds the spike concentration by a factor of four or more, spike recovery criteria is not applicable.

1.2.7 Laboratory Duplicates

Laboratory duplicate samples are analyzed to evaluate data precision, a measure of the reproducibilty of the analysis. The RPD between the sample and the duplicate sample is calculated. A control limit of 20% RPD should not be exceeded for analyte values greater than 100 times the IDL.

1.2.8 ICP Serial Dilutions

ICP serial dilutions assess the absence or presence of matrix interference. One sample from each set of similar matrix type is diluted by a factor of five. For an analyte concentration which is at least a factor of 100 times above the instrument detection limit, the measured concentrations of the undiluted sample and of the diluted sample should agree within 10 percent.

1.2.9 Atomic Absorption Duplicate Injections and Post-Digestion Spike Recoveries

During atomic absorption analysis, duplicate injections and post-digestion spikes are used to assess precision and accuracy of the laboratory analysis. The %RSD of duplicate injections must agree within 20 percent. Percent recovery of the post-digestion spike sample should fall between 85 and 115 percent.

2.0 DATA VALIDATION RESULTS — SDG 1263

All samples were received by the laboratory intact and with the proper documentation.
The samples in this SDG were analyzed for VOCs, SVOCs, and Appendix IX metals with USEPA Level IV deliverables. The following samples were included in this sample delivery group:

451S000101 451C000101 451S000102 451S000201
451S000202 451S000401 451S000301

Volatile Trip Blank: TRIP1

The following subsections summarize the data validation results. Tentatively identified compounds (TICs) have not been discussed in great detail, because most compounds are quantitatively uncertain (many TICs are unidentifiable and are reported as unknowns).

Volatile Organic Compound Fraction

1. All holding times, GC/MS instrument performance checks, surrogate spike recoveries, laboratory blanks, field and equipment blanks, internal standard performance, and field duplicate precision were acceptable. No problems were encountered during review of sample result verification.

2. The trip blank associated with these samples (TRIP1) contained methylene chloride at a concentration of 1 μg/L. The methylene chloride detected in sample 451S000301 was negated (flagged "U"). Methylene chloride was not detected in any other samples.

3. In the initial and continuing calibrations, several compounds had %RSDs and %Ds outside acceptable criteria. However, undetected results were not flagged because all the %RSDs and %Ds were less than 50%. Although negated during blank assessment, methylene chloride in sample 451S000301 was flagged "J" because the %D in the continuing calibration was -26.6.

Semivolatile Organic Compound Fraction

1. All holding times, GC/MS instrument performance checks, surrogate spike recoveries, initial calibrations, field and equipment blanks, and internal standard performance were acceptable. No problems were encountered during review of sample result verification.

2. The laboratory blanks SBLK111694F and SBLK111694J contained di-n-butylphthalate at concentrations of 190 μg/kg and 210 μg/kg, respectively. Di-n-butylphthalate was not detected in associated samples 451S000401 and 451S000301, therefore, no action was taken. Di-n-butylphthalate was detected in sample 451S000201; however, it was not detected in any associated blank and was not flagged.

3. In the continuing calibrations, several compounds had %RSDs and %Ds outside acceptable criteria but no positive results were affected. In addition, no undetected results were flagged because all the %RSDs and %Ds were less than 50%.

4. Field duplicates 451S000101 and 451C000101 were examined for precision and the RPD was calculated for all detected compounds. Below is a comparison of field duplicates that had high RPDs:

Compound	Sample Concentration	Duplicate Concentration	RPD
Fluoranthene	450	1100	84%
Pyrene	360	860	82%
Benzo(a)anthracene	190	420	75%
Chrysene	240	470	65%

All compounds listed above were flagged "J" in samples 451S000101 and 451C000101 indicating poor duplicate precision.

Appendix IX Metals Fraction

1. All holding times, instrument calibration, blank analysis, ICP interference check samples, ICP serial dilutions, laboratory control sample results, and field duplicate precision were acceptable. All results between the IDL and reporting limit flagged "B" by the laboratory were changed to "J" during validation. No problems were encountered during the review of sample results verification.

2. The preparation blank associated with all soil samples contained silver (0.668 mg/kg). All positive silver results were negated due to laboratory contamination, and have been flagged "U."

3. The initial calibration blank associated with all soil samples contained zinc at a concentration of 5.3 μg/L (1.06 mg/kg). Because all zinc sample results were greater than 5 times the blank concentration, no flags were applied. Therefore, all zinc results are acceptable.

4. Matrix spike analysis was performed on sample 451S000401. Sample spike recoveries for antimony (61.5%), chromium (155.5%), and zinc (281.1%) did not meet the 75-125% criteria, but did not require post-digestive spike analysis. As a result, all positive and undetected antimony values in this sample set are considered biased low and are flagged "J" and "UJ." Only positive chromium and zinc values are flagged "J," indicating a possible high bias of results.

5. The laboratory duplicate analysis was performed on sample 451S000401. Duplicate results for lead (21.9%) did not meet the QC criteria. All positive lead results have been flagged as estimated "J."

6. AA analytical spike recoveries did not meet the control limits of 85-115% (but did not require Method of Standard Addition analysis) for the following analytes:

   Selenium: 451S000101 (83.0%), 451S000102 (81.5%), 451C000101 (78.5%), 451S000401 (68.0%), 451S000301 (77.5%)

   Thallium: 451S000301 (64.2%)

   The positive and undetected selenium and thallium values detected in samples listed above were flagged as estimated ("J" and "UJ"), indicating matrix interference.

7. The GFAA analytical spike recovery did not meet the control limits of 85-115% and required Method of Standard Addition (MSA) analysis for arsenic in sample 451S000301, and lead in samples 451S000401, 451C000101, 451S000102, 451S000201, and

451S000301. The MSA correlation coefficients were within QC criteria, therefore, no flags were applied.

3.0 DATA VALIDATION RESULTS — SDG 1264

All samples were received by the laboratory intact and with the proper documentation. The following samples were included in this sample delivery group.

Samples	VOC*	SVOC*	Pest/ PCB*	Herb*	OP Pests*	APP IX Metals*	Total Lead*	TCLP Lead*	TPH*
122S000101	X	X				X			X
122S000201	X	X				X			X
122S000301	X	X				X			X
122S000401	X	X				X			X
122S000501	X	X				X			X
ON7S00010	X	X							X
ON7S00020	X	X							X
OP1M00010			X	X	X				
OP1M00020			X	X	X				
OP1M00030			X	X	X				
OP1N00030 (field dup)			X	X	X				
OP2M00010			X	X	X				
OP2M00020			X	X	X				
OP2M00030			X	X	X				
OSRS00010							X		
OSRS00020							X		
OSRC00020 (field dup)							X		
OSRS00030							X		
OSRS00040							X		
OTSS00010							X		
OTSS00020								X	
ON4S00010									X
ON4S00020									X
ON4S00030									X
ON4S00040									X

Samples	VOC[a]	SVOC[a]	Pest/ PCB[a]	Herb[a]	OP Pests[a]	APP IX Metals[a]	Total Lead[b]	TCLP Lead[b]	TPH[a]
OAGS00010									X
OAGS00020									X
TRITD12601 (trip blank)	X								

Notes:

[a]USEPA Level IV Deliverables
[b]USEPA Level III Deliverables

The following subsections summarize the data validation results. Tentatively identified compounds have not been discussed in great detail, because most compounds are quantitatively uncertain (many TICs are unidentifiable and are reported as unknowns).

Volatile Organic Compound Fraction

1. All holding times, GC/MS instrument performance checks, surrogate spike recoveries, laboratory blanks, trip blanks, field blanks, and equipment blanks were acceptable. A field duplicate was not included in this SDG. No problems were encountered during review of sample result verification.

2. In the initial and continuing calibrations, several compounds had %RSDs and %Ds outside acceptable criteria but no positive results were affected. The undetected results were not flagged because all the %RSDs and %Ds were less than 50%.

3. Samples 122S000101, 122S000201, 122S000401, ON7S000101, and ON7S000201 were reanalyzed because all internal standard area counts were outside the lower control window. Upon reanalysis, the internal area counts did not improve. Therefore, the original sample results were used and all positive and undetected results were flagged "J" and UJ" indicating a low bias. The reanalyzed samples will not appear in the summary tables.

   Sample 122S000301 had internal standard area counts outside the lower control window but was not reanalyzed. Therefore, all positive and undetected results were flagged "J" and UJ" indicating a low bias.

Semivolatile Organic Compound Fraction

1. All holding times, GC/MS instrument performance checks, surrogate spike recoveries, initial calibrations, equipment and field blanks, and internal standard performance were acceptable. A field duplicate was not included in this SDG. No problems were encountered during review of sample result verification.

2. The laboratory blanks SBLK111694F and SBLK111694J contained di-n-butylphthalate at concentrations of 190 μg/kg and 210 μg/kg, respectively. The di-n-butylphthalate detected in samples 122S000401 and 122S000501 was negated (flagged "U"). Di-n-butylphthalate was not detected in any other samples.

3. In the continuing calibrations, several compounds had %RSDs and %Ds outside acceptable criteria but no positive results were affected. The undetected results were not flagged because all the %RSDs and %Ds were less than 50%.

Pesticide/PCB Fraction

1. All holding times, GC instrument performance checks, primary column initial calibrations, surrogate spike recoveries, equipment and field blanks, and field duplicate precision were acceptable. No problems were encountered during review of sample result verification.

2. In the continuing calibrations, several compounds had %Ds outside acceptable criteria on the primary column but no positive results were affected. The undetected results were not flagged because all the %Ds were less than 50%.

Organophosphorus Pesticides Fraction

1. All holding times, GC instrument performance checks, primary column continuing calibrations, surrogate spike recoveries, laboratory control samples, laboratory, equipment and field blanks, MS/MSDs, and field duplicate precision were acceptable. No problems were encountered during review of sample result verification.

2. The %RSD for guthion was 25.9% for the primary column initial calibration analyzed on 11/19/94. Since guthion was undetected in the samples, no flags were applied.

Chlorinated Herbicide Fraction

1. All holding times, GC instrument performance checks, laboratory, equipment and field blanks were acceptable. No problems were encountered during review of sample result verification.

2. The %RSD for MCPA was 25.8% for the primary column initial calibration analyzed on 11/21/94. The continuing calibration had a %D for MCPA of 15.5% on the primary column analyzed on 11/21/94. Since MCPA was not detected in the associated samples, no flags were applied.

3. Surrogate DCAA was outside the control windows for samples OP1N000301 (136%) and OP2M000101 (18%). All nondetected values were flagged as estimated in sample OP2M000101, indicating a possible low bias. The surrogate exceeded the upper control window in sample OP1N000301. Since there were no positive results, this sample was not flagged.

4. MS/MSD recoveries for sample OP2M000301 were erratic. Dalapon and dinoseb had MS/MSD recoveries less than 10%. This is due in part to the esterification process. No positive dinoseb or dalapon was detected in sample OP2M000301. Therefore, the undetected values were rejected (flagged R).

   The remaining recoveries were within QC limits. However, the RPDs were erratic, ranging from 32 to 200%. No action was taken for the RPDs outside QC limits, since the %Rs were within QC limits.

5. Two LCS samples were analyzed with this SDG. The recoveries for dicamba (152% and 400%), 2,4-D (152%), and 2,4,5-TP (800%) were outside the upper QC limits. Only positive 2,4-D was flagged in samples OP1M000201 and OP1N000301. No other samples had positive values for dicamba, 2,4-D and 2,4,5-TP in this SDG.

6. Field duplicates 4OP1M000301 and OP1N000301 were examined for precision and the RPD was calculated for all detected compounds. 2,4,5-T was detected in the sample, but not in the field duplicate. Therefore, 2,4,5-T was flagged "J" in the sample and the duplicate was flagged "UJ."

Total Petroleum Hydrocarbons

1. All TPH results may be used without qualification. All holding times, instrument calibrations, blank analyses and laboratory control samples were acceptable. A laboratory duplicate analyses was not performed, however, no qualification was deemed necessary.

Appendix IX Metals/total Lead Fraction

1. All holding times, instrument calibration, field and equipment blank analysis, ICP interference check samples, ICP serial dilutions, laboratory control sample results, AA duplicate injections and post-digestion spike recoveries were acceptable. A field duplicate was not included in this SDG. No problems were encountered during the review of sample results verification.

2. The preparation blank associated with all soil samples contained selenium at a concentration of 0.57 mg/kg. The positive selenium result in sample 122S000101S was negated due to laboratory contamination, and flagged "U."

3. The continuing calibration blank associated with samples 122S000101, 122S000201, 122S000301, 122S000401, and 122S000501 contained silver at a concentration of 3.2 μg/L (0.64 mg/kg). The positive silver result in sample 122S000101S was negated due to laboratory contamination, and was flagged "U." None of the other associated samples contained silver.

   The continuing calibration blank associated with samples 122S000101, 122S000201, 122S000301, 122S000401, and 122S000501 contained thallium at a concentration of 6.8

μg/L (1.36 mg/kg). Since thallium was not detected in any samples, no action was taken.

The continuing calibration blank associated with samples 122S000201, 122S000301, 122S000401, and 122S000501 contained tin at a concentration of 19.2 μg/L (3.84 mg/kg). All positive tin results were negated due to laboratory contamination, and flagged "U." None of the other associated samples contained tin.

4. Matrix spike analysis was performed on sample 122S000101. Sample spike recoveries for antimony (64.5%) and selenium (71.5%) did not meet the 75-125% criteria, but did not require post-digestive spike analysis. As a result, all positive and undetected antimony and selenium values in this sample set are considered biased low and are flagged "J" and "UJ."

5. The laboratory duplicate analysis was performed on sample 122S000101. Duplicate results for lead (28.4%) did not meet the QC criteria. All positive lead results have been flagged as estimated "J."

TCLP Lead Fraction

1. All TCLP lead results may be used without qualification. All holding times, instrument calibrations, blank analyses, laboratory control samples, matrix spikes, laboratory duplicates, and ICP interference check samples were acceptable.

4.0 DATA VALIDATION RESULTS — SDG 1265

All samples were received by the laboratory intact and with the proper documentation. The following samples were included in this sample delivery group.

Samples	VOC[a]	SVOC[a]	Pest/PCB[a]	Herb[a]	OP Pests[a]	APP IX Metals[a]	TPH[b]
GWPE000101 (equipment blank)	X	X	X			X	X
GWPF000101 (field blank)	X	X	X			X	X
04NSS000101	X						
04NSS000201	X						
14NS000101	X						
18NS000101	X						
18NS000201	X						
22NS000101	X						
22NS000201	X						

Samples	VOC[a]	SVOC[a]	Pest/PCB[a]	Herb[a]	OP Pests[a]	APP IX Metals[a]	TPH[b]
27ES000101	X						
32SS000101	X						
32SC000101 (field dup)	X						
32SS000201	X						
36SS000101	X						
36SS000201	X						
TRITD12602 (trip blank)	X						
ONLM000101			X	X	X		
ONLM000201			X	X	X		
ONLM000301			X	X	X		
ONLM000401			X	X	X		
ONLM000501			X	X	X		
OTLM000101			X	X	X		
OTLM000201			X	X	X		
OTLM000301			X	X	X		
OTLM000401			X	X	X		
OTLM000501			X	X	X		
OTLM000601			X	X	X		
OTLM000701			X	X	X		
GASS000101							X
GASS000201							X
GASS000301							X
GASS000401							X
GASS000501							X
GASS000701							X
GASS000901							X
GASS001001							X
GASS001101							X
GASS001201							X
GASS001301							X
GASS001401							X
GASS001501							X

Samples	VOC[a]	SVOC[a]	Pest/PCB[a]	Herb[a]	OP Pests[a]	APP IX Metals[a]	TPH[b]
GASS001701							X
GASS001801							X
GASS001901							X
GASS002001							X
GASC002001 (field dup)							X

Notes:

[a]USEPA Level IV Deliverables
[b]USEPA Level III Deliverables

The following subsections summarize the data validation results. Tentatively identified compounds (TICs) have not been discussed in great detail, because most compounds are quantitatively uncertain (many TICs are unidentifiable and are reported as unknowns).

Volatile Organic Compound Fraction

1. All holding times, GC/MS instrument performance checks, field blanks, equipment blanks, and field duplicate precision were acceptable. No problems were encountered during review of sample result verification.

2. In the initial and continuing calibrations, several compounds had %RSDs and %Ds outside acceptable criteria but no positive results were affected. The undetected results were not flagged because all the %RSDs and %Ds were less than 50%.

3. The method blank associated with these samples (VBLK112394M) contained methylene chloride at a concentration of 1 μg/L. All methylene chloride detected in the investigative samples were negated (flagged "U").

4. The trip blank associated with these samples (TRITD12602) contained both methylene chloride and acetone at a concentration of 2 μg/L. Acetone was not detected in any of the investigative samples. All methylene chloride detected in the investigative samples were negated (flagged "U").

5. Samples 18NS000201 and 27ES000101 were reanalyzed because all internal standard area counts were outside the lower control window. Upon reanalysis, the internal area counts did not improve. Therefore, the original sample results were used and all positive and undetected results were flagged "J" and UJ" indicating a low bias. The reanalyzed samples will not appear in the summary tables.

   In sample 14NS000101, one internal standard (chlorobenzene-d5) had area counts outside the lower control window. Upon reanalysis, the internal area counts did not improve.

Therefore, all positive and undetected compounds associated with internal standard chlorobenzene-d5 were flagged "J" and "UJ" indicating a low bias. The reanalyzed sample will not appear in the summary tables.

In sample 22NS000101, all internal standard area counts were outside the lower control window. The reanalyzed sample (22NS000101RE) only had one internal standard (bromochloromethane) outside the lower area count control windows. The reanalyzed sample represents the better analysis. All positive and undetected compounds associated with internal standard bromochloromethane were flagged "J" and "UJ" indicating a low bias. The original sample will not appear in the summary tables.

Semivolatile Organic Compound Fraction

Only a field and equipment blank was included in this SDG for SVOC analysis. The field and equipment blank results were used to evaluate the investigative samples; therefore, no data evaluation was conducted.

Pesticide/PCB Fraction

1. All holding times, GC instrument performance checks, primary column initial calibrations, surrogate spike recoveries, and equipment and field blanks were acceptable. A field duplicate was not included in this SDG. No problems were encountered during review of sample result verification.

2. In the continuing calibrations, several compounds had %Ds outside acceptable criteria but no positive results were affected. The undetected results were not flagged because all the %Ds were less than 50%.

Organophosphorus Pesticide Fraction

1. All holding times, GC instrument performance checks, and equipment and field blanks, were acceptable. A field duplicate was not included in this SDG. No problems were encountered during review of sample result verification.

2. In the initial calibration, the %RSD for mevinphos (26.5%) and guthion (30.9%) exceeded the QC limits on the primary column. Since mevinphos and guthion were not detected in the associated samples, no flags were applied.

   Merphos and naled were initially calibrated by linear regression. The correlation coefficient was greater than 0.995; therefore, the calibration was acceptable.

3. In the continuing calibrations, several compounds had %Ds outside acceptable criteria but no positive results were affected. Undetected merphos and naled results were flagged "UJ" in the associated samples because the %Ds were 75.2% and 75.1%, respectively.

4. Sample ONLM000501 had a surrogate recovery of 124%. Since all the compounds were undetected in this sample, no flags were applied.

5. The LCS recovery for merphos was 0%. No positive merphos values were reported in this SDG. Therefore, all undetected merphos results were rejected and flagged "UR."

Chlorinated Herbicide Fraction
Samples ONLM000101, ONLM000201, ONLM000301, ONLM000401 and ONLM000501 had surrogate recoveries less than 10%. During sample analysis, EnSafe/Allen & Hoshall was contacted by the laboratory regarding these results. The reason for the low surrogate recoveries given by the laboratory was that the samples were emulsifying for three days during the hydrolysis step. The laboratory was informed that EnSafe/Allen & Hoshall would recollect the samples because the sediment matrix appeared to be affecting the preparation efficiency.

Herbicide samples ONLM000101, ONLM000201, ONLM000301, ONLM000401 and ONLM000501 from this SDG will not be reported. Please refer to SDG 1288 for the evaluation of the reanalyzed herbicide data. The remaining samples in this SDG are discussed below.

1. All holding times, GC instrument performance checks, laboratory, equipment and field blanks were acceptable. A field duplicate was not included in this SDG. No problems were encountered during review of sample result verification.

2. The %RSD for MCPA was 25.8% for the primary column initial calibration analyzed on 11/21/94. The continuing calibration had a %D for MCPA of 15.5% on the primary column analyzed on 11/21/94. Since MCPA was not detected in the associated samples, no flags were applied.

3. Surrogate DCAA was outside the control windows for samples OTLM000101 (33%), OTLM000401 (33%), OTLM000501 (39%), OTLM000601 (19%), OTLM000701 (19%). All positive and nondetected values were flagged as estimated ("J" and "UJ") in the samples listed above, indicating a possible low bias.

4. Two LCS samples were analyzed with this SDG. The recoveries for 2,4,5-TP (220%) and 2,4,5-T (200%) were outside the upper QC limits. Because 2,4,5-TP and 2,4,5-T were not detected in the associated samples, no flags were applied.

   Dinoseb had a recovery of 7% in one LCS sample. Since dinoseb was undetected in the investigative samples, all dinoseb values were rejected (flagged "UJ").

Total Petroleum Hydrocarbons
All TPH results may be used without qualification. All holding times, instrument calibrations, blank analyses, laboratory control samples, and laboratory duplicates were acceptable.

Appendix IX Metals Fraction
Only a field and equipment blank was included in this SDG for metals analysis. The field and equipment blank results were used to evaluate the investigative samples therefore, no data evaluation was conducted.

5.0 DATA VALIDATION RESULTS — SDG 1266

All samples were received by the laboratory intact and with the proper documentation. The following samples were included in this sample delivery group.

Samples	Pest/PCB[a]	Herb[a]	OP Pests[a]	TPH[b]
OLLM000101	X	X	X	
OLLM000201	X	X	X	
OLLM000301	X	X	X	
GASS002101				X
GASS002201				X
GASS002301				X
GASS002401				X
GASS002501				X
GASS002601				X
GASS002701				X
GASS002801				X
GASS002901				X
GASS003001				X
GASC003001 (field dup)				X

Notes:

[a]USEPA Level IV Deliverables
[b]USEPA Level III Deliverables

The following subsections summarize the data validation results.

PESTICIDE/PCB FRACTION

1. All holding times, GC instrument performance checks, primary column initial calibrations, surrogate spike recoveries, equipment and field blanks were acceptable. A field duplicate was not included in the package.

2. In the continuing calibrations, DDT had a %D outside acceptable criteria on the primary column but no positive results were affected. The undetected results were not flagged because the %D was less than 50%.

3. The following compounds were detected but the percent difference between the primary and secondary columns was greater than 25%:

Sample	Compound	Primary column	Secondary column	%D
OLLM000101	Dieldrin	5.5 µg/kg	19 µg/kg	245%
OLLM000201	Dieldrin	4.9 µg/kg	49 µg/kg	900%
OLLM000301	Dieldrin	18 µg/kg	98 µg/kg	444%

Only the values quantitated on the primary column were reported by the laboratory with a "P" qualifier. All dieldrin results in these three samples may be considered estimated concentrations (flagged "J") due to poor reproducability.

Organophosphorus Pesticides Fraction

1. All holding times, GC instrument performance checks, surrogate spike recoveries, laboratory control samples, and equipment and field blanks. A field duplicate was not included in the package. No problems were encountered during review of sample result verification.

2. The %RSDs for mevinphos (24.7%), fensulfothion (37.0%), guthion (44.8%), and coumophos (23.2%) were outside the control limits for the primary column initial calibration. Because these compounds were undetected in the samples, no flags were applied.

3. In the continuing calibrations, merphos had a %Ds of 66.9% but no positive results were affected. Undetected merphos results were flagged "UJ" in the associated samples because the %Ds were above 50%.

4. Instrument blank NIBLK02 contained mevinphos at a concentration of 1400 µg/kg. Since all the samples were undetected, no action was taken.

Chlorinated Herbicide Fraction

1. All holding times, GC instrument performance checks, surrogate recoveries, laboratory, equipment and field blanks were acceptable. No problems were encountered during review of sample result verification.

2. The %RSD for MCPA was 25.8% for the primary column initial calibration analyzed on 11/21/94. The continuing calibration had a %D for MCPA of 15.5% on the primary column analyzed on 11/21/94. Because MCPA was not detected in the associated samples, no flags were applied.

3. The LCS recovery for 2,4,5-T (164%) was outside the upper QC limits. Because 2,4,5-T was not detected in any of the investigative samples, no flags were applied.

Total Petroleum Hydrocarbons

1. All TPH results may be used without qualification. All holding times, instrument calibrations, blank analyses and laboratory control samples were acceptable. A laboratory duplicate analyses was not performed, however, no qualification was deemed necessary.

6.0 DATA VALIDATION RESULTS - NET SDG 1288

Five samples (ONLM000101, ONLM000201, ONLM000301, ONLM000401 and ONLM000501) were resampled and reanalyzed for herbicides because of severe matrix interference encountered during the initial analysis. (See Section 4.0, SDG 1265.)

1. All holding times, GC instrument performance checks, surrogate recoveries, and laboratory blanks were acceptable. No problems were encountered during review of sample result verification.

2. The %RSD for MCPA and MCPP for the primary column initial calibration was 29.6% and 23.8%, respectively. Because MCPA or MCPP were not detected in the associated samples, no flags were applied.

   The continuing calibration had %Ds for 2,4-D (15.95%), 2,4-DB (26.77%), 2,4,5-TP (17.89%), 2,4,5-T (29.22%), dalapon (15.08%), and dinoseb (19.60%) outside the upper control limits. Because none of these compounds were detected in the investigative samples, no flags were applied.

3. The LCS recoveries for 2,4,-D (213%) and dicamba (440%) were outside the upper QC limits. Since 2,4,5-T and dicamba were not detected in any of the investigative samples, no flags were applied.

   The LCS recovery for dinoseb (4.4%) was less than 10%. All undetected dinoseb values were rejected (flagged "UR").

7.0 DATA VALIDATION RESULTS - NET SDG 03876

Only one sample is included in this SDG. Sample 451V000101 was analyzed for TCLP VOCs, TCLP SVOCs, and TCLP metals. The sample was received by the laboratory intact and with the proper documentation.

TCLP Volatile Organic Fraction

1. All GC/MS instrument performance checks, surrogate spike recoveries, instrument calibration, and blank analysis were acceptable. No field duplicate was included in this package. Internal standard performance was not evaluated because it is not a requirement for the TCLP VOC method.

2. TCLP VOC sample 451V000101 was left on the zero headspace extraction (ZHE) apparatus longer than normal. The sample was leached again and reanalyzed. The reanalysis was outside of holding times but the results were the same as the original sample. Therefore, the original sample will be used and the reanalyzed sample will not appear in the data summary tables.

TCLP Semivolatile Organic Fraction

All TCLP SVOC results may be used without qualification. All evaluation parameters were acceptable.

TCLP Metals Fraction

1. All holding times, instrument calibration, laboratory duplicate, laboratory, field, and equipment blank analysis, and laboratory control sample results were acceptable. A field duplicate was not included in this SDG. ICP interference check samples and ICP serial dilutions were not evaluated because they are not a requirement for the TCLP metals method.

2. Matrix spike analysis was performed on sample 451V000101. The sample spike recovery for silver (52%) did not meet the 75-125% criteria, but did not require post-digestive spike analysis. As a result, all positive and undetected silver values in this sample set are considered biased low and are flagged "J" and "UJ."

8.0 DATA VALIDATION RESULTS - QUANTERRA SDGs 2295 and 2277

All samples were received by the laboratory intact and with the proper documentation.
The samples in these SDGs were analyzed for benzene, toluene, ethylbenzene, and xylene (BTEX), gasoline range organics (GRO), and diesel range organics (DRO) with USEPA Level III deliverables. The following samples were included in this sample delivery group.

452S000205 452S000210 452S000505 452S000510
452S001305 452S001310 452S001801 452S0BKG05
452S0BKG10

ATTACHMENT A

DATA VALIDATION SUMMARY TABLES

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1263

METAL													
	SAMPLE ID ------->	451-S-0001-01		451-C-0001-01		451-S-0001-02		451-S-0002-01		451-S-0002-02		451-S-0003-01	
	ORIGINAL ID ----->	451S000101		451C000101		451S000102		451S000201		451S000202		451S000301	
	LAB SAMPLE ID --->	112644		112647		112645		112646		112648		113090	
	ID FROM REPORT -->	451S000101		451C000101		451S000102		451S000201		451S000202		451S000301	
	SAMPLE DATE ----->	11/07/94		11/07/94		11/07/94		11/07/94		11/07/94		11/07/94	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
CAS #	Parameter	1263	VAL	1263	VAL	1263	VAL	1263	VAL	1263	VAL	1263	VAL
AL	Aluminum	NR		NR		NR		NR		NR		NR	
SB	Antimony	5.8	UJ	5.7	UJ	5.6	UJ	6.2	UJ	5.9	UJ	6.8	UJ
AS	Arsenic	5.7		7.7		10.4		7.7		8.3		3.	
BA	Barium	103.		81.4		114.		115.		127.		194.	
BE	Beryllium	0.41	J	0.38	J	0.42	J	0.45	J	0.47	J	0.76	J
CD	Cadmium	0.69	U	0.69	U	0.68	U	0.74	U	0.71	U	1.4	
CA	Calcium	NR		NR		NR		NR		NR		NR	
CR	Chromium	19.8	J	23.9	J	15.	J	16.4	J	11.2	J	63.6	J
CO	Cobalt	8.9	J	4.7	J	8.3	J	7.8	J	7.	J	11.3	J
CU	Copper	10.7		10.		15.9		15.6		13.6		12.2	
FE	Iron	NR		NR		NR		NR		NR		NR	
PB	Lead	24.8	J	31.	J	64.9	J	219.	J	19.6	J	152.	J
MG	Magnesium	NR		NR		NR		NR		NR		NR	
MN	Manganese	NR		NR		NR		NR		NR		NR	
HG	Mercury	0.12	U	0.11	U	0.11	U	0.12	U	0.13	U	0.14	U
NI	Nickel	11.6		10.1		15.9		14.4		10.7		12.9	
K	Potassium	NR		NR		NR		NR		NR		NR	
SE	Selenium	0.46	UJ	0.53	J	0.45	UJ	0.49	U	0.48	U	0.54	UJ
AG	Silver	0.69	U	1.2	U	0.99	U	0.74	U	2.6	U	1.1	U
NA	Sodium	NR		NR		NR		NR		NR		NR	
TL	Thallium	0.46	U	0.46	U	0.45	U	0.49	U	0.48	U	0.54	UJ
V	Vanadium	24.		20.3		20.9		20.2		20.6		15.8	
ZN	Zinc	60.2	J	56.6	J	95.3	J	373.	J	59.7	J	423.	J
SN	Tin	13.3	J	20.5	J	16.6	J	12.5	J	11.8	J	30.4	J

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1263

METAL

SAMPLE ID ------->	451-S-0004-01
ORIGINAL ID ----->	451S000401
LAB SAMPLE ID --->	113021
ID FROM REPORT -->	451S000401
SAMPLE DATE ----->	11/07/94
MATRIX ---------->	Soil
UNITS ---------->	mg/Kg

CAS #	Parameter	1263	VAL
AL	Aluminum	NR	
SB	Antimony	6.5	J
AS	Arsenic	4.2	
BA	Barium	60.5	
BE	Beryllium	0.26	U
CD	Cadmium	0.78	U
CA	Calcium	NR	
CR	Chromium	47.5	J
CO	Cobalt	6.3	J
CU	Copper	10.5	
FE	Iron	NR	
PB	Lead	426.	J
MG	Magnesium	NR	
MN	Manganese	NR	
HG	Mercury	0.41	
NI	Nickel	4.8	J
K	Potassium	NR	
SE	Selenium	0.52	UJ
AG	Silver	1.3	U
NA	Sodium	NR	
TL	Thallium	0.52	U
V	Vanadium	11.2	J
ZN	Zinc	249.	J
SN	Tin	14.1	J

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1263

SVOA															
	SAMPLE ID ------->	451-S-0001-01		451-C-0001-01		451-S-0001-02		451-S-0002-01		451-S-0002-02		451-S-0003-01	
	ORIGINAL ID ----->	451S000101		451C000101		451S000102		451S000201		451S000202		451S000301	
	LAB SAMPLE ID --->	112644		112647		112645		112646		112648		113090	
	ID FROM REPORT -->	451S000101		451C000101		451S000102		451S000201		451S000202		451S000301	
	SAMPLE DATE ----->	11/07/94		11/07/94		11/07/94		11/07/94		11/07/94		11/09/94	
	DATE EXTRACTED -->	11/10/94		11/10/94		11/10/94		11/10/94		11/10/94		11/16/94	
	DATE ANALYZED --->	11/14/94		11/14/94		11/14/94		11/14/94		11/14/94		11/21/94	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
CAS #	Parameter	1263	VAL	1263	VAL	1263	VAL	1263	VAL	1263	VAL	1263	VAL
108-95-2	Phenol	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
111-44-4	bis(2-Chloroethyl)ether	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
95-57-8	2-Chlorophenol	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
541-73-1	1,3-Dichlorobenzene	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
106-46-7	1,4-Dichlorobenzene	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
95-50-1	1,2-Dichlorobenzene	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
95-48-7	2-Methylphenol (o-Cresol)	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
106-44-5	4-Methylphenol (p-Cresol)	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
621-64-7	N-Nitroso-di-n-propylamine	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
67-72-1	Hexachloroethane	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
98-95-3	Nitrobenzene	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
78-59-1	Isophorone	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
88-75-5	2-Nitrophenol	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
105-67-9	2,4-Dimethylphenol	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
111-91-1	bis(2-Chloroethoxy)methane	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
120-83-2	2,4-Dichlorophenol	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
120-82-1	1,2,4-Trichlorobenzene	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
91-20-3	Naphthalene	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
106-47-8	4-Chloroaniline	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
87-68-3	Hexachlorobutadiene	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
59-50-7	4-Chloro-3-methylphenol	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
91-57-6	2-Methylnaphthalene	380.	U	390.	U	380.	U	410.	U	400.	U	130.	J
77-47-4	Hexachlorocyclopentadiene	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
88-06-2	2,4,6-Trichlorophenol	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
95-95-4	2,4,5-Trichlorophenol	920.	U	940.	U	920.	U	990.	U	960.	U	1100.	U
91-58-7	2-Chloronaphthalene	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
88-74-4	2-Nitroaniline	920.	U	940.	U	920.	U	990.	U	960.	U	1100.	U
131-11-3	Dimethylphthalate	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
208-96-8	Acenaphthylene	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
606-20-2	2,6-Dinitrotoluene	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
99-09-2	3-Nitroaniline	920.	U	940.	U	920.	U	990.	U	960.	U	1100.	U
83-32-9	Acenaphthene	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
51-28-5	2,4-Dinitrophenol	920.	U	940.	U	920.	U	990.	U	960.	U	1100.	U
100-02-7	4-Nitrophenol	920.	U	940.	U	920.	U	990.	U	960.	U	1100.	U
132-64-9	Dibenzofuran	380.	U	390.	U	380.	U	410.	U	400.	U	440.	U

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1263

SVOA													
		SAMPLE ID ------->	451-S-0001-01		451-C-0001-01		451-S-0001-02		451-S-0002-01		451-S-0002-02		451-S-0003-01
		ORIGINAL ID ----->	451S000101		451C000101		451S000102		451S000201		451S000202		451S000301
		LAB SAMPLE ID --->	112644		112647		112645		112646		112648		113090
		ID FROM REPORT -->	451S000101		451C000101		451S000102		451S000201		451S000202		451S000301
		SAMPLE DATE ----->	11/07/94		11/07/94		11/07/94		11/07/94		11/07/94		11/09/94
		DATE EXTRACTED -->	11/10/94		11/10/94		11/10/94		11/10/94		11/10/94		11/16/94
		DATE ANALYZED --->	11/14/94		11/14/94		11/14/94		11/14/94		11/14/94		11/21/94
		MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil
		UNITS ---------->	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg
CAS #	Parameter		1263	VAL	1263	VAL	1263	VAL	1263	VAL	1263	VAL	1263	VAL
121-14-2	2,4-Dinitrotoluene		380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
84-66-2	Diethylphthalate		380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
7005-72-3	4-Chlorophenyl-phenylether		380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
86-73-7	Fluorene		380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
100-01-6	4-Nitroaniline		920.	U	940.	U	920.	U	990.	U	960.	U	1100.	U
534-52-1	4,6-Dinitro-2-methylphenol		920.	U	940.	U	920.	U	990.	U	960.	U	1100.	U
86-30-6	N-Nitrosodiphenylamine		380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
101-55-3	4-Bromophenyl-phenylether		380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
118-74-1	Hexachlorobenzene		380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
87-86-5	Pentachlorophenol		920.	U	940.	U	920.	U	990.	U	960.	U	1100.	U
85-01-8	Phenanthrene		120.	J	310.	J	380.	U	410.	U	400.	U	510.	
120-12-7	Anthracene		380.	U	94.	J	380.	U	410.	U	400.	U	100.	J
86-74-8	Carbazole		380.	U	390.	U	380.	U	410.	U	400.	U	86.	J
84-74-2	Di-n-butylphthalate		380.	U	390.	U	380.	U	61.	J	400.	U	440.	U
206-44-0	Fluoranthene		450.	J	1100.	J	62.	J	410.	U	400.	U	620.	
129-00-0	Pyrene		360.	J	860.	J	47.	J	410.	U	400.	U	680.	
85-68-7	Butylbenzylphthalate		380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
91-94-1	3,3'-Dichlorobenzidine		380.	U	390.	U	380.	U	410.	U	400.	U	440.	U
56-55-3	Benzo(a)anthracene		190.	J	420.	J	380.	U	410.	U	400.	U	310.	J
218-01-9	Chrysene		240.	J	470.	J	49.	J	410.	U	400.	U	350.	J
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)		53.	J	390.	U	43.	J	75.	J	400.	U	770.	
117-84-0	Di-n-octylphthalate		380.	U	390.	U	380.	U	410.	U	400.	U	58.	J
205-99-2	Benzo(b)fluoranthene		120.	J	270.	J	36.	J	410.	U	400.	U	230.	J
207-08-9	Benzo(k)fluoranthene		150.	J	260.	J	380.	U	410.	U	400.	U	220.	J
50-32-8	Benzo(a)pyrene		130.	J	250.	J	42.	J	410.	U	400.	U	210.	J
193-39-5	Indeno(1,2,3-cd)pyrene		110.	J	140.	J	380.	U	67.	J	400.	U	150.	J
53-70-3	Dibenzo(a,h)anthracene		380.	U	50.	J	380.	U	410.	U	400.	U	52.	J
191-24-2	Benzo(g,h,i)perylene		84.	J	120.	J	380.	U	61.	J	400.	U	180.	J

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1263

SVOA

SAMPLE ID ------->	451-S-0004-01
ORIGINAL ID ----->	451S000401
LAB SAMPLE ID --->	113021
ID FROM REPORT -->	451S000401
SAMPLE DATE ----->	11/10/94
DATE EXTRACTED -->	11/16/94
DATE ANALYZED --->	11/21/94
MATRIX ---------->	Soil
UNITS ----------->	ug/Kg

CAS #	Parameter	1263	VAL
108-95-2	Phenol	380.	U
111-44-4	bis(2-Chloroethyl)ether	380.	U
95-57-8	2-Chlorophenol	380.	U
541-73-1	1,3-Dichlorobenzene	380.	U
106-46-7	1,4-Dichlorobenzene	380.	U
95-50-1	1,2-Dichlorobenzene	380.	U
95-48-7	2-Methylphenol (o-Cresol)	380.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380.	U
106-44-5	4-Methylphenol (p-Cresol)	380.	U
621-64-7	N-Nitroso-di-n-propylamine	380.	U
67-72-1	Hexachloroethane	380.	U
98-95-3	Nitrobenzene	380.	U
78-59-1	Isophorone	380.	U
88-75-5	2-Nitrophenol	380.	U
105-67-9	2,4-Dimethylphenol	380.	U
111-91-1	bis(2-Chloroethoxy)methane	380.	U
120-83-2	2,4-Dichlorophenol	380.	U
120-82-1	1,2,4-Trichlorobenzene	380.	U
91-20-3	Naphthalene	380.	U
106-47-8	4-Chloroaniline	380.	U
87-68-3	Hexachlorobutadiene	380.	U
59-50-7	4-Chloro-3-methylphenol	380.	U
91-57-6	2-Methylnaphthalene	39.	J
77-47-4	Hexachlorocyclopentadiene	380.	U
88-06-2	2,4,6-Trichlorophenol	380.	U
95-95-4	2,4,5-Trichlorophenol	920.	U
91-58-7	2-Chloronaphthalene	380.	U
88-74-4	2-Nitroaniline	920.	U
131-11-3	Dimethylphthalate	380.	U
208-96-8	Acenaphthylene	380.	U
606-20-2	2,6-Dinitrotoluene	380.	U
99-09-2	3-Nitroaniline	920.	U
83-32-9	Acenaphthene	380.	U
51-28-5	2,4-Dinitrophenol	920.	U
100-02-7	4-Nitrophenol	920.	U
132-64-9	Dibenzofuran	380.	U

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1263

SVOA

SAMPLE ID ------->	451-S-0004-01
ORIGINAL ID ----->	451S000401
LAB SAMPLE ID --->	113021
ID FROM REPORT -->	451S000401
SAMPLE DATE ----->	11/10/94
DATE EXTRACTED -->	11/16/94
DATE ANALYZED --->	11/21/94
MATRIX ---------->	Soil
UNITS ---------->	ug/Kg

CAS #	Parameter	1263	VAL
121-14-2	2,4-Dinitrotoluene	380.	U
84-66-2	Diethylphthalate	380.	U
7005-72-3	4-Chlorophenyl-phenylether	380.	U
86-73-7	Fluorene	380.	U
100-01-6	4-Nitroaniline	920.	U
534-52-1	4,6-Dinitro-2-methylphenol	920.	U
86-30-6	N-Nitrosodiphenylamine	380.	U
101-55-3	4-Bromophenyl-phenylether	380.	U
118-74-1	Hexachlorobenzene	380.	U
87-86-5	Pentachlorophenol	920.	U
85-01-8	Phenanthrene	41.	J
120-12-7	Anthracene	380.	U
86-74-8	Carbazole	380.	U
84-74-2	Di-n-butylphthalate	380.	U
206-44-0	Fluoranthene	380.	U
129-00-0	Pyrene	380.	U
85-68-7	Butylbenzylphthalate	380.	U
91-94-1	3,3'-Dichlorobenzidine	380.	U
56-55-3	Benzo(a)anthracene	380.	U
218-01-9	Chrysene	380.	U
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	4800.	J
117-84-0	Di-n-octylphthalate	380.	U
205-99-2	Benzo(b)fluoranthene	380.	U
207-08-9	Benzo(k)fluoranthene	380.	U
50-32-8	Benzo(a)pyrene	380.	U
193-39-5	Indeno(1,2,3-cd)pyrene	380.	U
53-70-3	Dibenzo(a,h)anthracene	380.	U
191-24-2	Benzo(g,h,i)perylene	380.	U

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1263

VOA																	
	SAMPLE ID ------->	451-S-0001-01		451-C-0001-01		451-S-0001-02		451-S-0002-01		451-S-0002-02		451-S-0003-01	
	ORIGINAL ID ----->	451S000101		451C000101		451S000102		451S000201		451S000202		451S000301	
	LAB SAMPLE ID --->	112644		112647		112645		112646		112648		113090	
	ID FROM REPORT -->	451S000101		451C000101		451S000102		451S000201		451S000202		451S000301	
	SAMPLE DATE ----->	11/07/94		11/07/94		11/07/94		11/07/94		11/07/94		11/09/94	
	DATE ANALYZED --->	11/10/94		11/12/94		11/12/94		11/12/94		11/14/94		11/20/94	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
CAS #	Parameter	1263	VAL	1263	VAL	1263	VAL	1263	VAL	1263	VAL	1263	VAL
74-87-3	Chloromethane	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
74-83-9	Bromomethane	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
75-01-4	Vinyl chloride	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
75-00-3	Chloroethane	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
75-09-2	Methylene chloride	11.	U	12.	U	11.	U	13.	U	12.	U	13.	UJ
67-64-1	Acetone	11.	U	12.	U	11.	U	13.	U	12.	U	70.	
75-15-0	Carbon disulfide	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
75-35-4	1,1-Dichloroethene	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
75-34-3	1,1-Dichloroethane	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
540-59-0	1,2-Dichloroethene (total)	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
67-66-3	Chloroform	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
107-06-2	1,2-Dichloroethane	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
78-93-3	2-Butanone (MEK)	11.	U	12.	U	11.	U	13.	U	12.	U	29.	
71-55-6	1,1,1-Trichloroethane	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
56-23-5	Carbon tetrachloride	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
75-27-4	Bromodichloromethane	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
78-87-5	1,2-Dichloropropane	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
10061-01-5	cis-1,3-Dichloropropene	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
79-01-6	Trichloroethene	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
124-48-1	Dibromochloromethane	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
79-00-5	1,1,2-Trichloroethane	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
71-43-2	Benzene	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
10061-02-6	trans-1,3-Dichloropropene	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
75-25-2	Bromoform	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
591-78-6	2-Hexanone	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
127-18-4	Tetrachloroethene	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
79-34-5	1,1,2,2-Tetrachloroethane	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
108-88-3	Toluene	11.	U	12.	U	11.	U	13.	U	12.	U	3.	J
108-90-7	Chlorobenzene	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
100-41-4	Ethylbenzene	11.	U	12.	U	11.	U	13.	U	12.	U	5.	J
100-42-5	Styrene	11.	U	12.	U	11.	U	13.	U	12.	U	13.	U
1330-20-7	Xylene (Total)	11.	U	12.	U	11.	U	13.	U	12.	U	36.	

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1263

VOA

SAMPLE ID ------->	451-S-0004-01
ORIGINAL ID ----->	451S000401
LAB SAMPLE ID --->	113021
ID FROM REPORT -->	451S000401
SAMPLE DATE ----->	11/10/94
DATE ANALYZED --->	11/17/94
MATRIX ---------->	Soil
UNITS ---------->	ug/Kg

CAS #	Parameter	1263	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	48.	
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)	5.	J
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	1.	J
100-42-5	Styrene	13.	U
1330-20-7	Xylene (Total)	13.	U

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1264

HERB													
	SAMPLE ID ------->	OP1-M-0001-01		OP1-M-0002-01		OP1-M-0003-01		OP1-N-0003-01		OP2-M-0001-01		OP2-M-0002-01	
	ORIGINAL ID ----->	OP1M000101		OP1M000201		OP1M000301		OP1N000301		OP2M000101		OP2M000201	
	LAB SAMPLE ID --->	112986		112987		112988		112989		112990		112991	
	ID FROM REPORT -->	OP1M000101		OP1M000201		OP1M000301		OP1N000301		OP2M000101		OP2M000201	
	SAMPLE DATE ----->	11/08/94		11/08/94		11/08/94		11/08/94		11/08/94		11/08/94	
	DATE EXTRACTED -->	11/21/94		11/21/94		11/21/94		11/21/94		11/21/94		11/21/94	
	DATE ANALYZED --->	11/21/94		11/22/94		11/22/94		11/22/94		11/22/94		11/22/94	
	MATRIX ---------->	Sediment		Sediment		Sediment		Sediment		Sediment		Sediment	
	UNITS ---------->	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
CAS #	Parameter	1264	VAL	1264	VAL	1264	VAL	1264	VAL	1264	VAL	1264	VAL
94-75-7	2,4-D	9.4	U	110.	J	9.4	U	17.	J	9.4	UJ	9.2	U
94-82-6	2,4-DB	9.5	U	9.4	U	9.5	U	9.1	U	9.4	UJ	9.3	U
88-85-7	Dinoseb	4.7	U	4.7	U	4.7	U	4.6	U	4.7	UJ	4.6	U
93-76-5	2,4,5-T	0.95	U	0.94	U	3.7	J	0.92	UJ	0.94	UJ	0.93	U
93-72-1	2,4,5-TP (Silvex)	0.95	U	0.94	U	0.95	U	0.92	U	0.94	UJ	0.93	U
75-99-0	Dalapon	23.	U	23.	U	23.	U	22.	U	23.	UJ	22.	U
1918-00-9	Dicamba	0.94	U	0.94	U	0.94	U	0.91	U	0.94	UJ	0.92	U
120-36-5	Dichlorprop	9.4	U	9.4	U	9.4	U	9.1	U	9.4	UJ	9.2	U
94-74-6	MCPA	940.	U	930.	U	940.	U	900.	U	930.	UJ	920.	U
93-65-2	MCPP	940.	U	930.	U	940.	U	900.	U	930.	UJ	920.	U

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1264

HERB

SAMPLE ID ------->	OP2-M-0003-01
ORIGINAL ID ----->	OP2M000301
LAB SAMPLE ID --->	112992
ID FROM REPORT -->	OP2M000301
SAMPLE DATE ----->	11/08/94
DATE EXTRACTED -->	11/21/94
DATE ANALYZED --->	11/22/94
MATRIX ---------->	Sediment
UNITS ---------->	ug/Kg

CAS #	Parameter	1264	VAL
94-75-7	2,4-D	9.	UJ
94-82-6	2,4-DB	9.1	UJ
88-85-7	Dinoseb	4.5	UR
93-76-5	2,4,5-T	4.5	UJ
93-72-1	2,4,5-TP (Silvex)	0.91	UJ
75-99-0	Dalapon	22.	UR
1918-00-9	Dicamba	0.9	UJ
120-36-5	Dichlorprop	9.1	UJ
94-74-6	MCPA	900.	UJ
93-65-2	MCPP	900.	UJ

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1264

LEAD	SAMPLE ID ------->	OSR-S-0001-01	OSR-S-0002-01	OSR-C-0002-01	OSR-S-0003-01	OSR-S-0004-01	OTS-S-0001-01
	ORIGINAL ID ----->	OSRS000101	OSRS000201	OSRC000201	OSRS000301	OSRS000401	OTSS000101
	LAB SAMPLE ID --->	113004	113005	113006	113007	113008	112757
	ID FROM REPORT -->	RS101L	RS201	RC201	RS301	RS401	OT101
	SAMPLE DATE ----->	11/10/94	11/10/94	11/10/94	11/10/94	11/10/94	11/07/94
	MATRIX ---------->	Soil	Soil	Soil	Soil	Soil	Soil
	UNITS ---------->	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
CAS #	Parameter	1264	1264	1264	1264	1264	1264
PB	Lead	14.	22.9	15.6	18.	13.2	1260.

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1264

METAL											
	SAMPLE ID ------->	122-S-0001-01		122-S-0002-01		122-S-0003-01		122-S-0004-01		122-S-0005-01	
	ORIGINAL ID ----->	122S000101		122S000201		122S000301		122S000401		122S000501	
	LAB SAMPLE ID --->	113009		113010		113011		113012		113013	
	ID FROM REPORT -->	1225000101		1225000201		1225000301		1225000401		1225000501	
	SAMPLE DATE ----->	11/07/94		11/07/94		11/07/94		11/07/94		11/07/94	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
CAS #	Parameter	1264	VAL	1264	VAL	1264	VAL	1264	VAL	1264	VAL
AL	Aluminum	NR		NR		NR		NR		NR	
SB	Antimony	6.	UJ	6.1	UJ	6.	UJ	6.6	UJ	6.2	UJ
AS	Arsenic	6.7		7.5		6.6		5.2		8.1	
BA	Barium	79.8		88.3		104.		115.		90.1	
BE	Beryllium	0.36	J	0.35	J	0.42	J	0.26	U	0.46	J
CD	Cadmium	0.72	U	0.73	U	0.72	U	2.2		1.4	
CA	Calcium	NR		NR		NR		NR		NR	
CR	Chromium	13.2		9.7		14.5		17.6		15.7	
CO	Cobalt	6.6	J	6.9	J	7.6	J	3.9	J	7.4	J
CU	Copper	16.4		15.8		16.7		29.6		21.8	
FE	Iron	NR		NR		NR		NR		NR	
PB	Lead	71.5	J	16.2		16.8		63.2		22.5	
MG	Magnesium	NR		NR		NR		NR		NR	
MN	Manganese	NR		NR		NR		NR		NR	
HG	Mercury	0.12	U	0.12	U	0.12	U	0.14		0.12	U
NI	Nickel	15.6		14.5		15.7		9.4	J	15.2	
K	Potassium	NR		NR		NR		NR		NR	
SE	Selenium	0.55	UJ	0.48	UJ	0.48	UJ	0.53	UJ	0.5	UJ
AG	Silver	0.85	U	0.73	U	0.72	U	0.79	U	0.74	U
NA	Sodium	NR		NR		NR		NR		NR	
TL	Thallium	0.48	U	0.48	U	0.48	U	0.53	U	0.5	U
V	Vanadium	17.4		17.7		25.4		14.4		27.3	
ZN	Zinc	76.7		63.		74.1		244.		115.	
SN	Tin	13.5	U	6.5	U	12.	U	7.8	U	7.2	U

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1264

PEST															
	SAMPLE ID ------->	OP1-M-0001-01		OP1-M-0002-01		OP1-M-0003-01		OP1-N-0003-01		OP2-M-0001-01		OP2-M-0002-01	
	ORIGINAL ID ----->	OP1M000101		OP1M000201		OP1M000301		OP1N000301		OP2M000101		OP2M000201	
	LAB SAMPLE ID --->	112997		112998		112999		113000		113001		113002	
	ID FROM REPORT -->	OP1M000101		OP1M000201		OP1M000301		OP1N000301		OP2M000101		OP2M000201	
	SAMPLE DATE ----->	11/08/94		11/08/94		11/08/94		11/08/94		11/08/94		11/08/94	
	DATE EXTRACTED -->	11/16/94		11/16/94		11/16/94		11/16/94		11/16/94		11/16/94	
	DATE ANALYZED --->	11/22/94		11/22/94		11/22/94		11/22/94		11/21/94		11/21/94	
	MATRIX ---------->	Sediment		Sediment		Sediment		Sediment		Sediment		Sediment	
	UNITS ---------->	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
CAS #	Parameter	1264	VAL	1264	VAL	1264	VAL	1264	VAL	1264	VAL	1264	VAL
319-84-6	alpha-BHC	2.4	U	2.7	U	2.5	U	2.5	U	4.	U	3.3	U
319-85-7	beta-BHC	2.4	U	2.7	U	2.5	U	2.5	U	4.	U	3.3	U
319-86-8	delta-BHC	2.4	U	2.7	U	2.5	U	2.5	U	4.	U	3.3	U
58-89-9	gamma-BHC (Lindane)	2.4	U	2.7	U	2.5	U	2.5	U	4.	U	3.3	U
76-44-8	Heptachlor	2.4	U	2.7	U	2.5	U	2.5	U	4.	U	3.3	U
309-00-2	Aldrin	2.4	U	2.7	U	2.5	U	2.5	U	4.	U	3.3	U
1024-57-3	Heptachlor epoxide	2.4	U	2.7	U	2.5	U	2.5	U	4.	U	3.3	U
959-98-8	Endosulfan I	2.4	U	2.7	U	2.5	U	2.5	U	4.	U	3.3	U
60-57-1	Dieldrin	4.7	U	5.3	U	4.9	U	4.9	U	7.7	U	6.3	U
72-55-9	4,4'-DDE	4.7	U	5.3	U	4.9	U	4.9	U	7.7	U	6.3	U
72-20-8	Endrin	4.7	U	5.3	U	4.9	U	4.9	U	7.7	U	6.3	U
33213-65-9	Endosulfan II	4.7	U	5.3	U	4.9	U	4.9	U	7.7	U	6.3	U
72-54-8	4,4'-DDD	4.7	U	5.3	U	4.9	U	4.9	U	7.7	U	6.3	U
1031-07-8	Endosulfan sulfate	4.7	U	5.3	U	4.9	U	4.9	U	7.7	U	6.3	U
50-29-3	4,4'-DDT	4.7	U	5.3	U	4.9	U	4.9	U	7.7	U	6.3	U
72-43-5	Methoxychlor	24.	U	27.	U	25.	U	25.	U	40.	U	33.	U
53494-70-5	Endrin ketone	4.7	U	5.3	U	4.9	U	4.9	U	7.7	U	6.3	U
7421-36-3	Endrin aldehyde	4.7	U	5.3	U	4.9	U	4.9	U	7.7	U	6.3	U
5103-71-9	alpha-Chlordane	2.4	U	2.7	U	2.5	U	2.5	U	4.	U	3.3	U
5103-74-2	gamma-Chlordane	2.4	U	2.7	U	2.5	U	2.5	U	4.	U	3.3	U
8001-35-2	Toxaphene	47.	U	53.	U	49.	U	49.	U	77.	U	63.	U
12674-11-2	Aroclor-1016	47.	U	53.	U	49.	U	49.	U	77.	U	63.	U
11104-28-2	Aroclor-1221	47.	U	53.	U	49.	U	49.	U	77.	U	63.	U
11141-16-5	Aroclor-1232	47.	U	53.	U	49.	U	49.	U	77.	U	63.	U
53469-21-9	Aroclor-1242	47.	U	53.	U	49.	U	49.	U	77.	U	63.	U
12672-29-6	Aroclor-1248	47.	U	53.	U	49.	U	49.	U	77.	U	63.	U
11097-69-1	Aroclor-1254	47.	U	53.	U	49.	U	49.	U	77.	U	63.	U
11096-82-5	Aroclor-1260	47.	U	53.	U	49.	U	49.	U	77.	U	63.	U

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1264

PEST

SAMPLE ID ------->	OP2-M-0003-01
ORIGINAL ID ----->	OP2M000301
LAB SAMPLE ID --->	113003
ID FROM REPORT -->	OP2M000301
SAMPLE DATE ----->	11/08/94
DATE EXTRACTED -->	11/16/94
DATE ANALYZED --->	11/21/94
MATRIX ---------->	Sediment
UNITS ----------->	ug/Kg

CAS #	Parameter	1264	VAL
319-84-6	alpha-BHC	3.	U
319-85-7	beta-BHC	3.	U
319-86-8	delta-BHC	3.	U
58-89-9	gamma-BHC (Lindane)	3.	U
76-44-8	Heptachlor	3.	U
309-00-2	Aldrin	3.	U
1024-57-3	Heptachlor epoxide	3.	U
959-98-8	Endosulfan I	3.	U
60-57-1	Dieldrin	5.8	U
72-55-9	4,4'-DDE	5.8	U
72-20-8	Endrin	5.8	U
33213-65-9	Endosulfan II	5.8	U
72-54-8	4,4'-DDD	5.8	U
1031-07-8	Endosulfan sulfate	5.8	U
50-29-3	4,4'-DDT	5.8	U
72-43-5	Methoxychlor	30.	U
53494-70-5	Endrin ketone	5.8	U
7421-36-3	Endrin aldehyde	5.8	U
5103-71-9	alpha-Chlordane	3.	U
5103-74-2	gamma-Chlordane	3.	U
8001-35-2	Toxaphene	58.	U
12674-11-2	Aroclor-1016	58.	U
11104-28-2	Aroclor-1221	58.	U
11141-16-5	Aroclor-1232	58.	U
53469-21-9	Aroclor-1242	58.	U
12672-29-6	Aroclor-1248	58.	U
11097-69-1	Aroclor-1254	58.	U
11096-82-5	Aroclor-1260	58.	U

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1264

SVOA													
	SAMPLE ID ------->	122-S-0001-01		122-S-0002-01		122-S-0003-01		122-S-0004-01		122-S-0005-01		ON7-S-0001-01	
	ORIGINAL ID ----->	122S000101		122S000201		122S000301		122S000401		122S000501		ON7S000101	
	LAB SAMPLE ID --->	113009		113010		113011		113012		113013		112995	
	ID FROM REPORT -->	1225000101		1225000201		1225000301		1225000401		1225000501		ON7S000101	
	SAMPLE DATE ----->	11/10/94		11/10/94		11/10/94		11/10/94		11/10/94		11/08/94	
	DATE EXTRACTED -->	11/16/94		11/16/94		11/16/94		11/16/94		11/16/94		11/16/94	
	DATE ANALYZED --->	11/21/94		11/21/94		11/21/94		11/21/94		11/21/94		11/21/94	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
CAS #	Parameter	1264	VAL	1264	VAL	1264	VAL	1264	VAL	1264	VAL	1264	VAL
108-95-2	Phenol	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
111-44-4	bis(2-Chloroethyl)ether	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
95-57-8	2-Chlorophenol	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
541-73-1	1,3-Dichlorobenzene	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
106-46-7	1,4-Dichlorobenzene	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
95-50-1	1,2-Dichlorobenzene	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
95-48-7	2-Methylphenol (o-Cresol)	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
106-44-5	4-Methylphenol (p-Cresol)	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
621-64-7	N-Nitroso-di-n-propylamine	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
67-72-1	Hexachloroethane	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
98-95-3	Nitrobenzene	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
78-59-1	Isophorone	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
88-75-5	2-Nitrophenol	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
105-67-9	2,4-Dimethylphenol	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
111-91-1	bis(2-Chloroethoxy)methane	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
120-83-2	2,4-Dichlorophenol	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
120-82-1	1,2,4-Trichlorobenzene	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
91-20-3	Naphthalene	380.	U	410.	U	390.	U	53.	J	400.	U	400.	U
106-47-8	4-Chloroaniline	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
87-68-3	Hexachlorobutadiene	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
59-50-7	4-Chloro-3-methylphenol	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
91-57-6	2-Methylnaphthalene	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
77-47-4	Hexachlorocyclopentadiene	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
88-06-2	2,4,6-Trichlorophenol	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
95-95-4	2,4,5-Trichlorophenol	920.	U	990.	U	940.	U	1100.	U	970.	U	960.	U
91-58-7	2-Chloronaphthalene	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
88-74-4	2-Nitroaniline	920.	U	990.	U	940.	U	1100.	U	970.	U	960.	U
131-11-3	Dimethylphthalate	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
208-96-8	Acenaphthylene	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
606-20-2	2,6-Dinitrotoluene	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
99-09-2	3-Nitroaniline	920.	U	990.	U	940.	U	1100.	U	970.	U	960.	U
83-32-9	Acenaphthene	380.	U	410.	U	390.	U	120.	J	400.	U	77.	J
51-28-5	2,4-Dinitrophenol	920.	U	990.	U	940.	U	1100.	U	970.	U	960.	U
100-02-7	4-Nitrophenol	920.	U	990.	U	940.	U	1100.	U	970.	U	960.	U
132-64-9	Dibenzofuran	380.	U	410.	U	390.	U	53.	J	400.	U	400.	U

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1264

SVOA													
	SAMPLE ID ------->	122-S-0001-01		122-S-0002-01		122-S-0003-01		122-S-0004-01		122-S-0005-01		ON7-S-0001-01	
	ORIGINAL ID ----->	122S000101		122S000201		122S000301		122S000401		122S000501		ON7S000101	
	LAB SAMPLE ID --->	113009		113010		113011		113012		113013		112995	
	ID FROM REPORT -->	1225000101		1225000201		1225000301		1225000401		1225000501		ON7S000101	
	SAMPLE DATE ----->	11/10/94		11/10/94		11/10/94		11/10/94		11/10/94		11/08/94	
	DATE EXTRACTED -->	11/16/94		11/16/94		11/16/94		11/16/94		11/16/94		11/16/94	
	DATE ANALYZED --->	11/21/94		11/21/94		11/21/94		11/21/94		11/21/94		11/21/94	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
CAS #	Parameter	1264	VAL	1264	VAL	1264	VAL	1264	VAL	1264	VAL	1264	VAL
121-14-2	2,4-Dinitrotoluene	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
84-66-2	Diethylphthalate	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
7005-72-3	4-Chlorophenyl-phenylether	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
86-73-7	Fluorene	380.	U	410.	U	390.	U	130.	J	400.	U	55.	J
100-01-6	4-Nitroaniline	920.	U	990.	U	940.	U	1100.	U	970.	U	960.	U
534-52-1	4,6-Dinitro-2-methylphenol	920.	U	990.	U	940.	U	1100.	U	970.	U	960.	U
86-30-6	N-Nitrosodiphenylamine	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
101-55-3	4-Bromophenyl-phenylether	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
118-74-1	Hexachlorobenzene	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
87-86-5	Pentachlorophenol	920.	U	990.	U	940.	U	1100.	U	970.	U	960.	U
85-01-8	Phenanthrene	51.	J	410.	U	390.	U	2400.		54.	J	550.	
120-12-7	Anthracene	380.	U	410.	U	390.	U	660.		400.	U	110.	J
86-74-8	Carbazole	380.	U	410.	U	390.	U	470.		400.	U	110.	J
84-74-2	Di-n-butylphthalate	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
206-44-0	Fluoranthene	170.	J	410.	U	390.	U	4100.	J	110.	J	720.	
129-00-0	Pyrene	150.	J	410.	U	390.	U	3200.		91.	J	630.	
85-68-7	Butylbenzylphthalate	380.	U	410.	U	390.	U	68.	J	400.	U	400.	U
91-94-1	3,3'-Dichlorobenzidine	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
56-55-3	Benzo(a)anthracene	82.	J	410.	U	390.	U	1900.		47.	J	360.	J
218-01-9	Chrysene	97.	J	410.	U	390.	U	2300.		59.	J	380.	J
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	39.	J	410.	U	390.	U	320.	J	400.	U	400.	U
117-84-0	Di-n-octylphthalate	380.	U	410.	U	390.	U	470.	U	400.	U	400.	U
205-99-2	Benzo(b)fluoranthene	78.	J	410.	U	390.	U	2100.		50.	J	300.	J
207-08-9	Benzo(k)fluoranthene	74.	J	410.	U	390.	U	1600.		43.	J	260.	J
50-32-8	Benzo(a)pyrene	79.	J	410.	U	390.	U	2000.		44.	J	270.	J
193-39-5	Indeno(1,2,3-cd)pyrene	51.	J	410.	U	390.	U	990.		400.	U	170.	J
53-70-3	Dibenzo(a,h)anthracene	380.	U	410.	U	390.	U	350.	J	400.	U	61.	J
191-24-2	Benzo(g,h,i)perylene	55.	J	410.	U	390.	U	960.		400.	U	170.	J

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1264

SVOA

SAMPLE ID ------->	ON7-S-0002-01
ORIGINAL ID ----->	ON7S000201
LAB SAMPLE ID --->	112996
ID FROM REPORT -->	ON7S000201
SAMPLE DATE ----->	11/08/94
DATE EXTRACTED -->	11/16/94
DATE ANALYZED --->	11/21/94
MATRIX ---------->	Soil
UNITS ----------->	ug/Kg

CAS #	Parameter	1264	VAL
108-95-2	Phenol	390.	U
111-44-4	bis(2-Chloroethyl)ether	390.	U
95-57-8	2-Chlorophenol	390.	U
541-73-1	1,3-Dichlorobenzene	390.	U
106-46-7	1,4-Dichlorobenzene	390.	U
95-50-1	1,2-Dichlorobenzene	390.	U
95-48-7	2-Methylphenol (o-Cresol)	390.	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390.	U
106-44-5	4-Methylphenol (p-Cresol)	390.	U
621-64-7	N-Nitroso-di-n-propylamine	390.	U
67-72-1	Hexachloroethane	390.	U
98-95-3	Nitrobenzene	390.	U
78-59-1	Isophorone	390.	U
88-75-5	2-Nitrophenol	390.	U
105-67-9	2,4-Dimethylphenol	390.	U
111-91-1	bis(2-Chloroethoxy)methane	390.	U
120-83-2	2,4-Dichlorophenol	390.	U
120-82-1	1,2,4-Trichlorobenzene	390.	U
91-20-3	Naphthalene	40.	J
106-47-8	4-Chloroaniline	390.	U
87-68-3	Hexachlorobutadiene	390.	U
59-50-7	4-Chloro-3-methylphenol	390.	U
91-57-6	2-Methylnaphthalene	41.	J
77-47-4	Hexachlorocyclopentadiene	390.	U
88-06-2	2,4,6-Trichlorophenol	390.	U
95-95-4	2,4,5-Trichlorophenol	940.	U
91-58-7	2-Chloronaphthalene	390.	U
88-74-4	2-Nitroaniline	940.	U
131-11-3	Dimethylphthalate	390.	U
208-96-8	Acenaphthylene	390.	U
606-20-2	2,6-Dinitrotoluene	390.	U
99-09-2	3-Nitroaniline	940.	U
83-32-9	Acenaphthene	430.	
51-28-5	2,4-Dinitrophenol	940.	U
100-02-7	4-Nitrophenol	940.	U
132-64-9	Dibenzofuran	180.	J

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1264

SVOA

SAMPLE ID ------->	ON7-S-0002-01
ORIGINAL ID ----->	ON7S000201
LAB SAMPLE ID --->	112996
ID FROM REPORT -->	ON7S000201
SAMPLE DATE ----->	11/08/94
DATE EXTRACTED -->	11/16/94
DATE ANALYZED --->	11/21/94
MATRIX ---------->	Soil
UNITS ----------->	ug/Kg

CAS #	Parameter	1264	VAL
121-14-2	2,4-Dinitrotoluene	390.	U
84-66-2	Diethylphthalate	390.	U
7005-72-3	4-Chlorophenyl-phenylether	390.	U
86-73-7	Fluorene	420.	
100-01-6	4-Nitroaniline	940.	U
534-52-1	4,6-Dinitro-2-methylphenol	940.	U
86-30-6	N-Nitrosodiphenylamine	390.	U
101-55-3	4-Bromophenyl-phenylether	390.	U
118-74-1	Hexachlorobenzene	390.	U
87-86-5	Pentachlorophenol	940.	U
85-01-8	Phenanthrene	3800.	J
120-12-7	Anthracene	1000.	
86-74-8	Carbazole	390.	U
84-74-2	Di-n-butylphthalate	390.	U
206-44-0	Fluoranthene	5300.	J
129-00-0	Pyrene	4500.	J
85-68-7	Butylbenzylphthalate	390.	U
91-94-1	3,3'-Dichlorobenzidine	390.	U
56-55-3	Benzo(a)anthracene	2700.	
218-01-9	Chrysene	2900.	
117-81-7	bis(2-Ethylhexyl)phthalate (BEHP)	96.	J
117-84-0	Di-n-octylphthalate	390.	U
205-99-2	Benzo(b)fluoranthene	2500.	
207-08-9	Benzo(k)fluoranthene	1700.	
50-32-8	Benzo(a)pyrene	2300.	
193-39-5	Indeno(1,2,3-cd)pyrene	1500.	
53-70-3	Dibenzo(a,h)anthracene	590.	
191-24-2	Benzo(g,h,i)perylene	1700.	

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1264

SW846-OP P													
	SAMPLE ID ------->	OP1-M-0001-01		OP1-M-0002-01		OP1-M-0003-01		OP1-N-0003-01		OP2-M-0001-01		OP2-M-0002-01	
	ORIGINAL ID ----->	OP1M000101		OP1M000201		OP1M000301		OP1N000301		OP2M000101		OP2M000201	
	LAB SAMPLE ID --->	112986		112987		112988		112989		112990		112991	
	ID FROM REPORT -->	OP1M000101		OP1M000201		OP1M000301		OP1N000301		OP2M000101		OP2M000201	
	SAMPLE DATE ----->	11/08/94		11/08/94		11/08/94		11/08/94		11/08/94		11/08/94	
	DATE EXTRACTED -->	11/15/94		11/15/94		11/15/94		11/15/94		11/15/94		11/15/94	
	DATE ANALYZED --->	11/20/94		11/20/94		11/20/94		11/20/94		11/20/94		11/20/94	
	MATRIX ---------->	Sediment		Sediment		Sediment		Sediment		Sediment		Sediment	
	UNITS ---------->	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
CAS #	Parameter	1264	VAL	1264	VAL	1264	VAL	1264	VAL	1264	VAL	1264	VAL
86-50-0	Guthion	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
35400-43-2	Sulprofos	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
2921-88-2	Chloropyrifos	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
56-72-4	Coumaphos	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
8065-48-3	Demeton,O	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
333-41-5	Diazinon	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
62-73-7	Dichlorvos	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
298-04-4	Disulfoton	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
13194-48-4	Ethoprop	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
115-90-2	Fensulfothion	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
55-38-9	Fenthion	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
150-50-5	Merphos	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
7786-34-7	Mevinphos, Alpha	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
300-76-5	Naled	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
298-00-0	Methyl parathion	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
298-02-2	Phorate	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
299-84-3	Ronnel	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
22248-79-9	Stirophos (Tetrachlorovinphos)	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
34643-46-4	Tokuthion	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
327-98-0	Trichloronate	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U
126-75-0	Demeton,S	120.	U	130.	U	130.	U	130.	U	200.	U	140.	U

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1264

SW846-OP P

SAMPLE ID ------->	OP2-M-0003-01
ORIGINAL ID ----->	OP2M000301
LAB SAMPLE ID --->	112992
ID FROM REPORT -->	OP2M000301
SAMPLE DATE ----->	11/08/94
DATE EXTRACTED -->	11/15/94
DATE ANALYZED --->	11/20/94
MATRIX ---------->	Sediment
UNITS ---------->	ug/Kg

CAS #	Parameter	1264	VAL
86-50-0	Guthion	150.	U
35400-43-2	Sulprofos	150.	U
2921-88-2	Chloropyrifos	150.	U
56-72-4	Coumaphos	150.	U
8065-48-3	Demeton,O	150.	U
333-41-5	Diazinon	150.	U
62-73-7	Dichlorvos	150.	U
298-04-4	Disulfoton	150.	U
13194-48-4	Ethoprop	150.	U
115-90-2	Fensulfothion	150.	U
55-38-9	Fenthion	150.	U
150-50-5	Merphos	150.	U
7786-34-7	Mevinphos, Alpha	150.	U
300-76-5	Naled	150.	U
298-00-0	Methyl parathion	150.	U
298-02-2	Phorate	150.	U
299-84-3	Ronnel	150.	U
22248-79-9	Stirophos (Tetrachlorovinphos)	150.	U
34643-46-4	Tokuthion	150.	U
327-98-0	Trichloronate	150.	U
126-75-0	Demeton,S	150.	U

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1264

TCLP-LEAD							
	SAMPLE ID ------->	OTS-S-0002-01					
	ORIGINAL ID ----->	OTSS000201					
	LAB SAMPLE ID --->	112758					
	ID FROM REPORT -->	OTSS000201					
	SAMPLE DATE ----->	11/07/94					
	DATE EXTRACTED -->	11/16/94					
	DATE ANALYZED --->	11/21/94					
	MATRIX ---------->	Soil					
	UNITS ---------->	mg/L					
CAS #	Parameter	1264	VAL				
7439-92-1	Lead	3.6					

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1264

TPH													
	SAMPLE ID ------->	122-S-0001-01		122-S-0002-01		122-S-0003-01		122-S-0004-01		122-S-0005-01		OAG-S-0001-01	
	ORIGINAL ID ----->	122S000101		122S000201		122S000301		122S000401		122S000501		OAGS000101	
	LAB SAMPLE ID --->	113015		113016		113017		113018		113019		112982	
	ID FROM REPORT -->	1225000101		1225000201		1225000301		1225000401		1225000501		OAGS000101	
	SAMPLE DATE ----->	11/10/94		11/10/94		11/10/94		11/10/94		11/10/94		11/08/94	
	DATE EXTRACTED -->	12/02/94		12/02/94		12/02/94		12/02/94		12/02/94		11/18/94	
	DATE ANALYZED --->	12/05/94		12/05/94		12/05/94		12/05/94		12/05/94		11/28/94	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
CAS #	Parameter	1264	VAL	1264	VAL	1264	VAL	1264	VAL	1264	VAL	1264	VAL
9999900-02-4	Petroleum Hydrocarbons, TPH	90.	U	81.	U	82.	U	140.		80.	U	79.	U

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1264

TPH													
	SAMPLE ID ------->	OAG-S-0002-01		ON4-S-0001-01		ON4-S-0002-01		ON4-S-0003-01		ON4-S-0004-01		ON7-S-0001-01	
	ORIGINAL ID ----->	OAGS000201		ON4S000101		ON4S000201		ON4S000301		ON4S000401		ON7S000101	
	LAB SAMPLE ID --->	112983		112759		112760		112761		112762		112995	
	ID FROM REPORT -->	OAGS000201		ON4S000101		ON4S000201		ON4S000301		ON4S000401		ON7S000101	
	SAMPLE DATE ----->	11/08/94		11/07/94		11/07/94		11/07/94		11/07/94		11/08/94	
	DATE EXTRACTED -->	11/18/94		11/18/94		11/18/94		11/18/94		11/18/94		11/18/94	
	DATE ANALYZED --->	11/28/94		11/28/94		11/28/94		11/28/94		11/28/94		11/28/94	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
CAS #	Parameter	1264	VAL	1264	VAL	1264	VAL	1264	VAL	1264	VAL	1264	VAL
9999900-02-4	Petroleum Hydrocarbons, TPH	79.	U	83.	U	89.		84.	U	78.	U	80.	U

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1264

TPH	SAMPLE ID ------->	ON7-S-0002-01
	ORIGINAL ID ----->	ON7S000201
	LAB SAMPLE ID --->	112996
	ID FROM REPORT -->	ON7S000201
	SAMPLE DATE ----->	11/08/94
	DATE EXTRACTED -->	11/18/94
	DATE ANALYZED --->	11/28/94
	MATRIX ---------->	Soil
	UNITS ----------->	mg/Kg

CAS #	Parameter	1264	VAL
9999900-02-4	Petroleum Hydrocarbons, TPH	100.	

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1264

VOA															
		SAMPLE ID ------->	122-S-0001-01		122-S-0002-01		122-S-0003-01		122-S-0004-01		122-S-0005-01		ON7-S-0001-01		
		ORIGINAL ID ----->	122S000101		122S000201		122S000301		122S000401		122S000501		ON7S000101		
		LAB SAMPLE ID --->	113009		113010		113011		113012		113013		112995		
		ID FROM REPORT -->	1225000101		1225000201		1225000301		1225000401		1225000501		ON7S000101		
		SAMPLE DATE ----->	11/10/94		11/10/94		11/10/94		11/10/94		11/10/94		11/08/94		
		DATE ANALYZED --->	11/15/94		11/15/94		11/16/94		11/16/94		11/17/94		11/15/94		
		MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil		
		UNITS ---------->	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		
CAS #	Parameter		1264	VAL	1264	VAL	1264	VAL	1264	VAL	1264	VAL	1264	VAL	
74-87-3	Chloromethane		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
74-83-9	Bromomethane		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
75-01-4	Vinyl chloride		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
75-00-3	Chloroethane		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
75-09-2	Methylene chloride		12.	UJ	12.	UJ	1.	J	1.	J	12.	U	12.	UJ	
67-64-1	Acetone		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	5.	J	
75-15-0	Carbon disulfide		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
75-35-4	1,1-Dichloroethene		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
75-34-3	1,1-Dichloroethane		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
540-59-0	1,2-Dichloroethene (total)		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
67-66-3	Chloroform		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
107-06-2	1,2-Dichloroethane		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
78-93-3	2-Butanone (MEK)		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
71-55-6	1,1,1-Trichloroethane		24.	J	5.	J	2.	J	4.	J	12.	U	12.	UJ	
56-23-5	Carbon tetrachloride		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
75-27-4	Bromodichloromethane		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
78-87-5	1,2-Dichloropropane		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
10061-01-5	cis-1,3-Dichloropropene		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
79-01-6	Trichloroethene		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
124-48-1	Dibromochloromethane		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
79-00-5	1,1,2-Trichloroethane		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
71-43-2	Benzene		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
10061-02-6	trans-1,3-Dichloropropene		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
75-25-2	Bromoform		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
108-10-1	4-Methyl-2-Pentanone (MIBK)		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
591-78-6	2-Hexanone		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
127-18-4	Tetrachloroethene		1.	J	12.	UJ	12.	UJ	4.	J	12.	U	12.	UJ	
79-34-5	1,1,2,2-Tetrachloroethane		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
108-88-3	Toluene		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
108-90-7	Chlorobenzene		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
100-41-4	Ethylbenzene		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
100-42-5	Styrene		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	
1330-20-7	Xylene (Total)		12.	UJ	12.	UJ	12.	UJ	13.	UJ	12.	U	12.	UJ	

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1264

VOA

SAMPLE ID ------->	ON7-S-0002-01
ORIGINAL ID ----->	ON7S000201
LAB SAMPLE ID --->	112996
ID FROM REPORT -->	ON7S000201
SAMPLE DATE ----->	11/08/94
DATE ANALYZED --->	11/15/94
MATRIX ---------->	Soil
UNITS ----------->	ug/Kg

CAS #	Parameter	1264	VAL
74-87-3	Chloromethane	12.	UJ
74-83-9	Bromomethane	12.	UJ
75-01-4	Vinyl chloride	12.	UJ
75-00-3	Chloroethane	12.	UJ
75-09-2	Methylene chloride	12.	UJ
67-64-1	Acetone	12.	UJ
75-15-0	Carbon disulfide	12.	UJ
75-35-4	1,1-Dichloroethene	12.	UJ
75-34-3	1,1-Dichloroethane	12.	UJ
540-59-0	1,2-Dichloroethene (total)	12.	UJ
67-66-3	Chloroform	12.	UJ
107-06-2	1,2-Dichloroethane	12.	UJ
78-93-3	2-Butanone (MEK)	12.	UJ
71-55-6	1,1,1-Trichloroethane	12.	UJ
56-23-5	Carbon tetrachloride	12.	UJ
75-27-4	Bromodichloromethane	12.	UJ
78-87-5	1,2-Dichloropropane	12.	UJ
10061-01-5	cis-1,3-Dichloropropene	12.	UJ
79-01-6	Trichloroethene	12.	UJ
124-48-1	Dibromochloromethane	12.	UJ
79-00-5	1,1,2-Trichloroethane	12.	UJ
71-43-2	Benzene	12.	UJ
10061-02-6	trans-1,3-Dichloropropene	12.	UJ
75-25-2	Bromoform	12.	UJ
108-10-1	4-Methyl-2-Pentanone (MIBK)	12.	UJ
591-78-6	2-Hexanone	12.	UJ
127-18-4	Tetrachloroethene	12.	UJ
79-34-5	1,1,2,2-Tetrachloroethane	12.	UJ
108-88-3	Toluene	12.	UJ
108-90-7	Chlorobenzene	12.	UJ
100-41-4	Ethylbenzene	12.	UJ
100-42-5	Styrene	12.	UJ
1330-20-7	Xylene (Total)	12.	UJ

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1265

HERB													
	SAMPLE ID ------->	OTL-M-0001-01		OTL-M-0002-01		OTL-M-0003-01		OTL-M-0004-01		OTL-M-0005-01		OTL-M-0006-01	
	ORIGINAL ID ----->	OTLM000101		OTLM000201		OTLM000301		OTLM000401		OTLM000501		OTLM000601	
	LAB SAMPLE ID --->	113091		113092		113093		113094		113095		113096	
	ID FROM REPORT -->	OTLM000101		OTLM000201		OTLM000301		OTLM000401		OTLM000501		OTLM000601	
	SAMPLE DATE ----->	11/14/94		11/14/94		11/14/94		11/14/94		11/14/94		11/14/94	
	DATE EXTRACTED -->	11/23/94		11/23/94		11/23/94		11/23/94		11/23/94		11/23/94	
	DATE ANALYZED --->	11/28/94		11/28/94		11/29/94		11/29/94		11/29/94		11/29/94	
	MATRIX ---------->	Sediment		Sediment		Sediment		Sediment		Sediment		Sediment	
	UNITS ---------->	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
CAS #	Parameter	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL
94-75-7	2,4-D	9.4	UJ	9.4	U	9.4	U	9.4	UJ	9.4	UJ	9.4	UJ
94-82-6	2,4-DB	9.5	UJ	9.5	U	9.5	U	9.4	UJ	9.4	UJ	9.5	UJ
88-85-7	Dinoseb	4.7	UR	4.7	UR	4.7	UR	4.7	UR	4.7	UR	4.7	UR
93-76-5	2,4,5-T	0.95	UJ	0.95	U	0.95	U	0.94	UJ	0.94	UJ	0.95	UJ
93-72-1	2,4,5-TP (Silvex)	0.95	UJ	0.95	U	0.95	U	0.94	UJ	0.94	UJ	0.95	UJ
75-99-0	Dalapon	23.	UJ	23.	U	23.	U	23.	UJ	23.	UJ	23.	UJ
1918-00-9	Dicamba	0.94	UJ	0.95	U	0.94	U	0.94	UJ	0.94	UJ	0.94	UJ
120-36-5	Dichlorprop	9.4	UJ	9.4	U	9.4	U	9.4	UJ	9.4	UJ	9.4	UJ
94-74-6	MCPA	930.	UJ	930.	U	930.	U	930.	UJ	930.	UJ	930.	UJ
93-65-2	MCPP	940.	UJ	940.	U	940.	U	930.	UJ	930.	UJ	940.	UJ

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1265

HERB

SAMPLE ID ------->	OTL-N-0007-01
ORIGINAL ID ----->	OTLM000701
LAB SAMPLE ID --->	113097
ID FROM REPORT -->	OTLM000701
SAMPLE DATE ----->	11/14/94
DATE EXTRACTED -->	11/23/94
DATE ANALYZED --->	11/29/94
MATRIX ---------->	Sediment
UNITS ---------->	ug/Kg

CAS #	Parameter	D1265	VAL
94-75-7	2,4-D	9.4	UJ
94-82-6	2,4-DB	9.5	UJ
88-85-7	Dinoseb	4.7	UR
93-76-5	2,4,5-T	0.95	UJ
93-72-1	2,4,5-TP (Silvex)	0.95	UJ
75-99-0	Dalapon	23.	UJ
1918-00-9	Dicamba	0.94	UJ
120-36-5	Dichlorprop	9.4	UJ
94-74-6	MCPA	930.	UJ
93-65-2	MCPP	940.	UJ

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1265

PEST																	
	SAMPLE ID ------->	ONL-M-0001-01		ONL-M-0002-01		ONL-M-0003-01		ONL-M-0004-01		ONL-M-0005-01		OTL-M-0001-01	
	ORIGINAL ID ----->	ONLM000101		ONLM000201		ONLM000301		ONLM000401		ONLM000501		OTLM000101	
	LAB SAMPLE ID --->	113110		113111		113112		113113		113114		113103	
	ID FROM REPORT -->	ONLM000101		ONLM000201		ONLM000301		ONLM000401		ONLM000501		OTLM000101	
	SAMPLE DATE ----->	11/15/94		11/14/94		11/14/94		11/14/94		11/14/94		11/14/94	
	DATE EXTRACTED -->	11/16/94		11/16/94		11/16/94		11/16/94		11/16/94		11/16/94	
	DATE ANALYZED --->	11/21/94		11/21/94		11/21/94		11/21/94		11/21/94		11/20/94	
	MATRIX ---------->	Sediment		Sediment		Sediment		Sediment		Sediment		Sediment	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL
319-84-6	alpha-BHC	2.3	U	2.5	U	2.8	U	2.5	U	2.5	U	3.	U
319-85-7	beta-BHC	2.3	U	2.5	U	2.8	U	2.5	U	2.5	U	3.	U
319-86-8	delta-BHC	2.3	U	2.5	U	2.8	U	2.5	U	2.5	U	3.	U
58-89-9	gamma-BHC (Lindane)	2.3	U	2.5	U	2.8	U	2.5	U	2.5	U	3.	U
76-44-8	Heptachlor	2.3	U	2.5	U	2.8	U	2.5	U	2.5	U	3.	U
309-00-2	Aldrin	2.3	U	2.5	U	2.8	U	12.		2.5	U	3.	U
1024-57-3	Heptachlor epoxide	2.3	U	2.5	U	2.8	U	2.5	U	2.5	U	3.	U
959-98-8	Endosulfan I	2.3	U	2.5	U	2.8	U	2.5	U	2.5	U	3.	U
60-57-1	Dieldrin	4.5	U	4.9	U	5.5	U	14.		4.8	U	5.8	U
72-55-9	4,4'-DDE	4.5	U	4.9	U	5.5	U	4.9	U	4.8	U	5.8	U
72-20-8	Endrin	4.5	U	4.9	U	5.5	U	4.9	U	4.8	U	5.8	U
33213-65-9	Endosulfan II	4.5	U	4.9	U	5.5	U	4.9	U	4.8	U	5.8	U
72-54-8	4,4'-DDD	4.5	U	4.9	U	5.5	U	4.9	U	4.8	U	5.8	U
1031-07-8	Endosulfan sulfate	4.5	U	4.9	U	5.5	U	4.9	U	4.8	U	5.8	U
50-29-3	4,4'-DDT	4.5	U	4.9	U	5.5	U	4.9	U	4.8	U	5.8	U
72-43-5	Methoxychlor	23.	U	25.	U	28.	U	25.	U	25.	U	30.	U
53494-70-5	Endrin ketone	4.5	U	4.9	U	5.5	U	4.9	U	4.8	U	5.8	U
7421-36-3	Endrin aldehyde	4.5	U	4.9	U	5.5	U	4.9	U	4.8	U	5.8	U
5103-71-9	alpha-Chlordane	2.3	U	2.5	U	2.8	U	2.5	U	2.5	U	3.	U
5103-74-2	gamma-Chlordane	2.3	U	2.5	U	2.8	U	2.5	U	2.5	U	3.	U
8001-35-2	Toxaphene	45.	U	49.	U	55.	U	49.	U	48.	U	58.	U
12674-11-2	Aroclor-1016	45.	U	49.	U	55.	U	49.	U	48.	U	58.	U
11104-28-2	Aroclor-1221	45.	U	49.	U	55.	U	49.	U	48.	U	58.	U
11141-16-5	Aroclor-1232	45.	U	49.	U	55.	U	49.	U	48.	U	58.	U
53469-21-9	Aroclor-1242	45.	U	49.	U	55.	U	49.	U	48.	U	58.	U
12672-29-6	Aroclor-1248	45.	U	49.	U	55.	U	49.	U	48.	U	58.	U
11097-69-1	Aroclor-1254	45.	U	49.	U	55.	U	49.	U	48.	U	58.	U
11096-82-5	Aroclor-1260	45.	U	49.	U	55.	U	49.	U	48.	U	58.	U

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1265

PEST													
	SAMPLE ID ------->	OTL-M-0002-01		OTL-M-0003-01		OTL-M-0004-01		OTL-M-0005-01		OTL-M-0006-01		OTL-M-0007-01	
	ORIGINAL ID ----->	OTLM000201		OTLM000301		OTLM000401		OTLM000501		OTLM000601		OTLM000701	
	LAB SAMPLE ID --->	113104		113105		113106		113107		113108		113109	
	ID FROM REPORT -->	OTLM000201		OTLM000301		OTLM000401		OTLM000501		OTLM000601		OTLM000701	
	SAMPLE DATE ----->	11/14/94		11/14/94		11/14/94		11/14/94		11/14/94		11/14/94	
	DATE EXTRACTED -->	11/16/94		11/16/94		11/16/94		11/16/94		11/16/94		11/16/94	
	DATE ANALYZED --->	11/20/94		11/20/94		11/20/94		11/21/94		11/21/94		11/21/94	
	MATRIX ---------->	Sediment		Sediment		Sediment		Sediment		Sediment		Sediment	
	UNITS ---------->	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
CAS #	Parameter	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL
319-84-6	alpha-BHC	2.5	U	2.3	U	2.9	U	3.8	U	2.7	U	2.7	U
319-85-7	beta-BHC	2.5	U	2.3	U	2.9	U	3.8	U	2.7	U	2.7	U
319-86-8	delta-BHC	2.5	U	2.3	U	2.9	U	3.8	U	2.7	U	2.7	U
58-89-9	gamma-BHC (Lindane)	2.5	U	2.3	U	2.9	U	3.8	U	2.7	U	2.7	U
76-44-8	Heptachlor	2.5	U	2.3	U	2.9	U	3.8	U	2.7	U	2.7	U
309-00-2	Aldrin	2.5	U	2.3	U	2.9	U	3.8	U	2.7	U	2.7	U
1024-57-3	Heptachlor epoxide	2.5	U	2.3	U	2.9	U	3.8	U	2.7	U	2.7	U
959-98-8	Endosulfan I	2.5	U	2.3	U	2.9	U	3.8	U	2.7	U	2.7	U
60-57-1	Dieldrin	4.8	U	4.5	U	5.7	U	7.3	U	5.2	U	5.2	U
72-55-9	4,4'-DDE	4.8	U	4.5	U	5.7	U	7.3	U	5.2	U	5.2	U
72-20-8	Endrin	4.8	U	4.5	U	5.7	U	7.3	U	5.2	U	5.2	U
33213-65-9	Endosulfan II	4.8	U	4.5	U	5.7	U	7.3	U	5.2	U	5.2	U
72-54-8	4,4'-DDD	4.8	U	4.5	U	5.7	U	7.3	U	5.2	U	5.2	U
1031-07-8	Endosulfan sulfate	4.8	U	4.5	U	5.7	U	7.3	U	5.2	U	5.2	U
50-29-3	4,4'-DDT	4.8	U	4.5	U	5.7	U	7.3	U	5.2	U	5.2	U
72-43-5	Methoxychlor	25.	U	23.	U	29.	U	38.	U	27.	U	27.	U
53494-70-5	Endrin ketone	4.8	U	4.5	U	5.7	U	7.3	U	5.2	U	5.2	U
7421-36-3	Endrin aldehyde	4.8	U	4.5	U	5.7	U	7.3	U	5.2	U	5.2	U
5103-71-9	alpha-Chlordane	2.5	U	2.3	U	2.9	U	3.8	U	2.7	U	2.7	U
5103-74-2	gamma-Chlordane	2.5	U	2.3	U	2.9	U	3.8	U	2.7	U	2.7	U
8001-35-2	Toxaphene	48.	U	45.	U	57.	U	73.	U	52.	U	52.	U
12674-11-2	Aroclor-1016	48.	U	45.	U	57.	U	73.	U	52.	U	52.	U
11104-28-2	Aroclor-1221	48.	U	45.	U	57.	U	73.	U	52.	U	52.	U
11141-16-5	Aroclor-1232	48.	U	45.	U	57.	U	73.	U	52.	U	52.	U
53469-21-9	Aroclor-1242	48.	U	45.	U	57.	U	73.	U	52.	U	52.	U
12672-29-6	Aroclor-1248	48.	U	45.	U	57.	U	73.	U	52.	U	52.	U
11097-69-1	Aroclor-1254	48.	U	45.	U	57.	U	73.	U	52.	U	52.	U
11096-82-5	Aroclor-1260	48.	U	45.	U	57.	U	73.	U	52.	U	52.	U

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1265

SW846-OP P													
	SAMPLE ID ------->	ONL-M-0001-01		ONL-M-0002-01		ONL-M-0003-01		ONL-M-0004-01		ONL-M-0005-01		OTL-M-0001-01	
	ORIGINAL ID ----->	ONLM000101		ONLM000201		ONLM000301		ONLM000401		ONLM000501		OTLM000101	
	LAB SAMPLE ID --->	113098		113099		113100		113101		113102		113091	
	ID FROM REPORT -->	ONLM000101		ONLM000201		ONLM000301		ONLM000401		ONLM000501		OTLM000101	
	SAMPLE DATE ----->	11/14/94		11/14/94		11/14/94		11/14/94		11/14/94		11/14/94	
	DATE EXTRACTED -->	11/18/94		11/18/94		11/18/94		11/18/94		11/18/94		11/18/94	
	DATE ANALYZED --->	12/07/94		12/07/94		12/07/94		12/07/94		12/07/94		12/06/94	
	MATRIX ---------->	Sediment		Sediment		Sediment		Sediment		Sediment		Sediment	
	UNITS ---------->	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
CAS #	Parameter	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL
86-50-0	Guthion	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
35400-43-2	Sulprofos	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
2921-88-2	Chloropyrifos	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
56-72-4	Coumaphos	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
8065-48-3	Demeton,O	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
333-41-5	Diazinon	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
62-73-7	Dichlorvos	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
298-04-4	Disulfoton	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
13194-48-4	Ethoprop	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
115-90-2	Fensulfothion	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
55-38-9	Fenthion	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
150-50-5	Merphos	130.	UR	120.	UR	150.	UR	120.	UR	130.	UR	140.	UR
7786-34-7	Mevinphos, Alpha	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
300-76-5	Naled	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
298-00-0	Methyl parathion	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
298-02-2	Phorate	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
299-84-3	Ronnel	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
22248-79-9	Stirophos (Tetrachlorovinphos)	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
34643-46-4	Tokuthion	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
327-98-0	Trichloronate	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U
126-75-0	Demeton,S	130.	U	120.	U	150.	U	120.	U	130.	U	140.	U

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1265

SW846-OP P													
	SAMPLE ID ------->	OTL-M-0002-01		OTL-M-0003-01		OTL-M-0004-01		OTL-M-0005-01		OTL-M-0006-01		OTL-M-0007-01	
	ORIGINAL ID ----->	OTLM000201		OTLM000301		OTLM000401		OTLM000501		OTLM000601		OTLM000701	
	LAB SAMPLE ID --->	113092		113093		113094		113095		113096		113097	
	ID FROM REPORT -->	OTLM000201		OTLM000301		OTLM000401		OTLM000501		OTLM000601		OTLM000701	
	SAMPLE DATE ----->	11/14/94		11/14/94		11/14/94		11/14/94		11/14/94		11/14/94	
	DATE EXTRACTED -->	11/18/94		11/18/94		11/18/94		11/18/94		11/18/94		11/18/94	
	DATE ANALYZED --->	12/06/94		12/06/94		12/06/94		12/07/94		12/07/94		12/07/94	
	MATRIX ---------->	Sediment		Sediment		Sediment		Sediment		Sediment		Sediment	
	UNITS ---------->	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
CAS #	Parameter	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL
86-50-0	Guthion	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U
35400-43-2	Sulprofos	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U
2921-88-2	Chloropyrifos	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U
56-72-4	Coumaphos	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U
8065-48-3	Demeton,O	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U
333-41-5	Diazinon	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U
62-73-7	Dichlorvos	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U
298-04-4	Disulfoton	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U
13194-48-4	Ethoprop	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U
115-90-2	Fensulfothion	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U
55-38-9	Fenthion	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U
150-50-5	Merphos	130.	UR	120.	UR	140.	UR	170.	UR	140.	UR	130.	UR
7786-34-7	Mevinphos, Alpha	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U
300-76-5	Naled	130.	U	120.	U	140.	U	170.	UJ	140.	UJ	130.	UJ
298-00-0	Methyl parathion	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U
298-02-2	Phorate	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U
299-84-3	Ronnel	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U
22248-79-9	Stirophos (Tetrachlorovinphos)	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U
34643-46-4	Tokuthion	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U
327-98-0	Trichloronate	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U
126-75-0	Demeton,S	130.	U	120.	U	140.	U	170.	U	140.	U	130.	U

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1265

TPH													
	SAMPLE ID ------->	GAS-S-0001-01		GAS-S-0002-01		GAS-S-0003-01		GAS-S-0004-01		GAS-S-0005-01		GAS-S-0007-01	
	ORIGINAL ID ----->	GASS000101		GASS000201		GASS000301		GASS000401		GASS000501		GASS000701	
	LAB SAMPLE ID --->	113247		113248		113249		113250		113251		113252	
	ID FROM REPORT -->	GASS000101		GASS000201		GASS000301		GASS000401		GASS000501		GASS000701	
	SAMPLE DATE ----->	11/15/94		11/15/94		11/15/94		11/15/94		11/15/94		11/15/94	
	DATE EXTRACTED -->	12/05/94		12/05/94		12/05/94		12/05/94		12/05/94		12/05/94	
	DATE ANALYZED --->	12/10/94		12/10/94		12/10/94		12/10/94		12/10/94		12/10/94	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
CAS #	Parameter	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL
9999900-02-4	Petroleum Hydrocarbons, TPH	78.	U	1600.		81.	U	82.	U	130.		80.	U

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1265

TPH													
		SAMPLE ID ------->	GAS-S-0009-01		GAS-S-0010-01		GAS-C-0010-01		GAS-S-0011-01		GAS-S-0012-01		GAS-S-0013-01
		ORIGINAL ID ----->	GASS000901		GASS001001		GASC001001		GASS001101		GASS001201		GASS001301
		LAB SAMPLE ID --->	113253		113254		113255		113256		113238		113239
		ID FROM REPORT -->	GASS000901		GASS001001		GASC001001		GASS001101		GASS001201		GASS001301
		SAMPLE DATE ----->	11/15/94		11/15/94		11/15/94		11/15/94		11/15/94		11/15/94
		DATE EXTRACTED -->	12/05/94		12/05/94		12/05/94		12/05/94		12/02/94		12/02/94
		DATE ANALYZED --->	12/10/94		12/10/94		12/10/94		12/10/94		12/09/94		12/09/94
		MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil
		UNITS ---------->	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg
CAS #	Parameter		D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL
9999900-02-4	Petroleum Hydrocarbons, TPH		81.		220.		250.		100.		81.		360.

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1265

TPH													
	SAMPLE ID ------->	GAS-S-0014-01		GAS-S-0015-01		GAS-S-0017-01		GAS-S-0018-01		GAS-S-0019-01		GAS-S-0020-01	
	ORIGINAL ID ----->	GASS001401		GASS001501		GASS001701		GASS001801		GASS001901		GASS002001	
	LAB SAMPLE ID --->	113240		113241		113242		113243		113244		113246	
	ID FROM REPORT -->	GASS001401		GASS001501		GASS001701		GASS001801		GASS001901		GASS002001	
	SAMPLE DATE ----->	11/15/94		11/15/94		11/15/94		11/15/94		11/15/94		11/15/94	
	DATE EXTRACTED -->	12/02/94		12/02/94		12/02/94		12/02/94		12/02/94		12/02/94	
	DATE ANALYZED --->	12/09/94		12/09/94		12/09/94		12/09/94		12/09/94		12/09/94	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
CAS #	Parameter	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL	D1265	VAL
9999900-02-4	Petroleum Hydrocarbons, TPH	170.		270.		1700.		93.		320.		370.	

*** Validation Complete ***

NAS MEMPHIS
GRAY AREA/SWMU 45 INVESTIGATION
NET SDG 1265

TPH							
	SAMPLE ID ------->	GAS-C-0020-01					
	ORIGINAL ID ----->	GASC002001					
	LAB SAMPLE ID --->	113245					
	ID FROM REPORT -->	GASC002001					
	SAMPLE DATE ----->	11/15/94					
	DATE EXTRACTED -->	12/02/94					
	DATE ANALYZED --->	12/09/94					
	MATRIX ---------->	Soil					
	UNITS ---------->	mg/Kg					
CAS #	Parameter	D1265 VAL					
9999900-02-4	Petroleum Hydrocarbons, TPH	310.					

*** Validation Complete ***