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STATEMENT OF BASIS SOLID WASTE MANAGEMENT UNIT 46 (SWMU 46) FORMER
HAZARDOUS WASTE ACCUMULATION AREA MILLINGTON SUPPACT TN
12/01/2005
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

**SWMU 46 — Former Hazardous Waste Accumulation Area
Naval Support Activity Mid-South
Millington, Tennessee**

Purpose of the Statement of Basis

This Statement of Basis (SB) has been prepared to inform the public and provide an opportunity to comment on the proposed remedy at solid waste management unit (SWMU) 46 — a former hazardous waste accumulation area at Naval Support Activity (NSA) Mid-South, Millington, Tennessee. NSA Mid-South is responsible for corrective action at SWMU 46 as a result of a Resource Conservation and Recovery Act (RCRA) permit. The Tennessee Department of Environment and Conservation (TDEC) has determined that the proposed remedy for SWMU 46, land-use controls that restrict residential reuse and prohibit use of the site's groundwater, is protective of human health and the environment and will remain in effect until completion of the SWMU 14 corrective measures.

Before the remedy is finalized, TDEC would like to give the public an opportunity to comment on

Site Description

SWMU 46, located on NSA Mid-South's Southside (Figure 1), is a former hazardous waste accumulation area that was associated with Building S-140. Building S-140, which is SWMU 14, was used for training Navy personnel in painting processes and included a paint spray booth, paint removing area, and paint wash-down area. Paint-related wastes collected in floor drains, which emptied into a combination of sumps, outdoor wash basins, and, eventually, into either the storm sewer or sanitary sewer. Both SWMUs were operational from 1943 until 1985, when Building S-140 was demolished and the hazardous waste accumulation area was removed. The SWMUs were investigated together as one since they are adjacent to each other.

the proposed remedy. At any time during the public comment period, the public may comment as described in the following section "How Can You Participate?" Upon closure of the public comment period, TDEC will evaluate all comments and determine if there is a need to modify the proposed remedy.

How Can You Participate?

TDEC solicits public review and comments on this SB prior to implementation of the proposed remedy as the final one. The final remedy for SWMU 46 will be incorporated into the Hazardous and Solid Waste Amendments Permit TNHW-094 for NSA Mid-South, scheduled to be updated in 2006.



Figure 1 SWMU 46 at NSA Mid-South, Millington, Tennessee

Public comment on this SB and the proposed remedy will begin on the date that a notice of the SB's availability is published in *The Millington Star* and *The Commercial Appeal*, local daily newspapers. Since community input could affect selection of a final remedy for SWMU 46, a public comment period has been established for 45 days from *(insert date)*. If requested during the comment period, TDEC will hold a public meeting to respond to any comments or questions regarding the proposed remedy. To request a hearing or to provide comments, contact the following person in writing within the 45-day comment period:

Mr. Roger Donovan
TDEC — Division of Solid Waste
Management



SWMU 46
Statement of Basis



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Investigative reports and documents related to SWMU 46 are referenced at the end of this SB and are included in the Administrative Record, which can be reviewed in the Information Repository that was established to provide public access to documents pertaining to the Navy's environmental program. The Information Repository is maintained at:

Millington Civic Center
8077 Wilkinsville Road
Millington, Tennessee 38053
(901) 873-5770

Background Summary

Past operations at the former Naval Air Station (NAS) Memphis included metal plating, manufacturing, and other operations that involved the use of toxic and hazardous materials. Land use changed as a result of the 1990 Base Closure and Realignment (BRAC) Act, and the name of the facility was changed from NAS Memphis to NSA Mid-South.

A significant portion of NSA Mid-South's Northside was transferred to the city of Millington, and the remaining property, including SWMU 46, was realigned (i.e., an operation was reassigned from NSA Mid-South to another facility, and/or an operation from another facility was reassigned to NSA Mid-South). Three facility operations changed: (1) Navy airfield operations ceased in October 1995, (2) training operations were realigned to NAS Pensacola in 1996, and (3) administrative operations for the Navy Bureau of Personnel were realigned from Washington, D.C., to NSA Mid-South in 1997. SWMU 46 is part of the remaining NSA Mid-South property.

As required by the Navy's RCRA Permit, NSA Mid-South is required to evaluate and assess all SWMUs for potential environmental impacts. Due to the former presence of a hazardous waste accumulation area and painting processes at adjacent Building S-140, SWMUs 14 and 46 were designated as SWMUs and warranted further evaluation to determine whether they posed a risk to human health and the environment.

The subsequent *RCRA Facility Investigation* (RFI; EnSafe, 2000) evaluated soil and groundwater impacts at both SWMUs 14 and 46 due to their proximity (although sample designations in this SB have prefixes of 014). Groundwater impacts were identified and corrective measures warranted due to chlorinated solvents in shallow loess groundwater.

A subsequent *Corrective Measures Study* (CMS; EnSafe, 2003) recommended a groundwater remedy of enhanced bioremediation with natural attenuation monitoring. Substrate injections to facilitate enhanced bioremediation began in February 2005.

TDEC decided that since groundwater impacts associated with SWMU 46 are being addressed with SWMU 14 corrective measures, the selected remedy for SWMU 46 is land-use controls that prohibit use of the site's groundwater and restrict residential reuse of the property. The land use controls will be re-evaluated at the conclusion of the SWMU 14 corrective measures. The basis for this remedy is provided under the "Summary of Contaminant Evaluation" and the "Summary of Site Risk" sections of the SB.

Summary of Contaminant Evaluation

Soil and sediment sample locations from the RFI are shown on Figure 2 (Attachment 1) and groundwater sample locations are provided in Figure 3 (Attachment 1). The number of samples collected from each media and the

chemicals detected above risk-based screening values are both summarized below.

Soil

The soil data set is based on 31 soil samples collected from 21 locations; 14 subsurface samples were collected from 11 direct-push locations (014S0005 through 014S0015); eight surface and 16 subsurface samples were collected from locations 014S01LS – 03LS, 014S04LF, 014S06LF, 014S07LF, 014S08LS); and two surface and two subsurface samples were collected from locations 014S0003 and 014S0004. Soil sample locations are provided in Figure 2 (Attachment 1).

Benzo(a)pyrene, a semi-volatile organic compound, was detected in four surface-soil samples above the U.S. Environmental Protection Agency's (USEPA) residential risk-based screening concentration (RBC-Res) but below the industrial RBC (RBC-Ind). Dibenz(a,h)anthracene was detected in a single sample above the residential RBC, but below the industrial RBC screening value. No metal concentrations were detected in soil that exceeded both the background reference concentration and the RBC. Table 1 lists sample locations and concentrations of maximum detections that exceeded the screening criteria.

Table 1
Surface-Soil Contaminants (Max) Exceeding Risk-Based Screening Criteria (ppb)^a

Sample Location	Analyte	Result	RBC-Res ^b	RBC-Ind ^b
014S04LF	Benzo(a)pyrene	560	87	780
014S04LF	Dibenz(a,h)anthracene	130	87	780

Notes:

- ^a — Units of parts per billion
^b — Denotes risk-based concentrations (RBCs): residential RBC (RBC-Res) and industrial RBC (RBC-Ind), taken from *Risk-Based Concentration Table*, October 7, 1999 (USEPA, 1999).

Groundwater

Groundwater samples were collected from two zones as part of the RFI — the clays and silts of the loess (LS) that is the principal land surface unit, and the deeper lower fluvial (LF) sand and gravels which were the source of domestic water before municipal water was introduced to the area. Loess groundwater samples were collected from depths ranging between 9 and 20 feet while fluvial groundwater samples were collected from depths ranging between 36 and 49 feet. Fourteen loess sample locations and 13 deeper fluvial deposits sample locations were characterized.

Samples were collected through a combination of direct-push methods (014G0005 through 014G0012), five monitoring wells screened in the loess (014G01LS-014G03LS, 014G05LS, and 014G08LS), and four monitoring wells screened in the fluvial deposits (014G01LS, 014G04LF, 014G06LF, and 014G07LF). Groundwater sample locations are shown on Figure 3 (Attachment 1).

The RFI identified the volatile organic compounds (VOCs) trichloroethylene (TCE), tetrachloroethylene (PCE), *cis*-1,2-dichloroethene (*cis*-1,2-DCE), and benzene, with a majority of the contaminants in shallow loess groundwater. TCE exceeded its risk-based or regulatory drinking water standard in seven loess locations and two fluvial locations, whereas PCE exceeded its respective standards at two loess locations and *cis*-1,2-DCE exceeded its tap water RBC (RBC-Tap Water) at one loess location. Total petroleum hydrocarbons (TPH) were also detected above TDEC's most stringent action level of 100 ppb in three loess and three fluvial locations. Detected in two fluvial locations, arsenic was the only metal that exceeded both its risk-based screening level and background reference concentration 3.5 ppb. Table 2 lists the maximum chemical concentrations of exceedances, the associated locations, and the respective screening criteria.

Table 2
Groundwater Contaminants Exceeding Risk- or Regulatory-Based Screening Criteria (maximum detections in ppb)^a

Sample Location	Analyte	Result	MCL ^b	RBC-Tap Water ^c	IAQ ^d
014G0007 (LS)	TCE	285	5	1.6	5.3
014G0007 (LS)	PCE	230	5	1.1	110
014G011 (UF)	Benzene	5	5	0.32	140
014G02LS (LS)	cis-1,2-DCE	62	70	61	210
014G02LS (LS)	TPH	1,300	100 ^e	NA	NA
014G07LF (LF)	Arsenic	3.9	50	0.045	NA

Notes:

- ^a — ppb = parts per billion
- ^b — Maximum Contaminant Levels (MCLs) in drinking water are from the *Drinking Water Regulations and Health Advisories* (USEPA, 1996).
- ^c — The risk-based concentration for tap water (RBC-Tap Water) is taken from the *Risk-Based Concentration Table*, April 2000 (USEPA, 2000).
- ^d — Indoor Air Quality (IAQ) screening value from Table 2a of *OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils* (USEPA, 2002)
- ^e — Because no Tap Water RBC or MCL exists for TPH, TDEC's non-drinking water standard for TPH was used. LS Loess sample location LF Lower fluvial deposits sample location

Table 2 also lists the target groundwater concentrations that correspond to potential indoor air quality concerns. TCE and PCE exceeded their respective thresholds, indicating a potential indoor air quality concern to future site occupants.

Sediment

Sediment samples were collected from two locations (014M0001 and 014M0002) in the drainage ditch bordering the east side of the site (see Figure 2, Attachment 1).

Pesticides, semi-volatile organic compounds, and metals were detected above the USEPA's sediment screening values (SSVs) in both

samples. Table 3 lists the maximum detections of the chemicals and their respective SSVs.

Table 3
Exceedances in Sediment (ppb^a)

Sample Location	Contaminant	Maximum Detected Concentration	SSV ^b
014M0001	Pyrene	400	330
	Fluoranthene	550	330
	Chrysene	370	330
	BEHP	2,300	182
	4,4'-DDT	1,900	3.3
	4,4'-DDD	330	3.3
	Copper ^c	19.9	18.7
014M0002	Lead ^c	61.8	30.2
	Nickel ^c	18.2	15.9
	Arsenic ^c	9.5	7.24
	4,4'-DDE	23	3.3
	4,4'-DDD	29	3.3

Notes:

- ^a — Units in parts per billion (ppb)
- ^b — Sediment Screening Value (SSV); values obtained from the *Ecological Screening Values – Ecological Risk Assessment Bulletin No. 2* (USEPA, 1999).
- ^c — Units in parts per million (ppm)

Summary of Site Risk

As part of the RFI, risks to human health and the environment from the contaminants identified at SWMU 46 were evaluated using human health and ecological risk assessments, which were developed in accordance with existing USEPA and TDEC methods.

Human Health Risk

Human health risk at SWMU 46 was assessed using four land-use scenarios: site worker, trespasser, maintenance worker, and future site resident. A discussion of each media, the chemicals of concern associated with that media, and populations that could be at risk are discussed below.

• **Soil and Sediment**

No chemicals of concern were identified for any of the land-use scenarios evaluated.

- **Groundwater**

Chemicals of concern in groundwater for a hypothetical residential scenario include the metals arsenic, chromium, vanadium, and barium and the VOCs *cis*-1,2-DCE, TCE, benzene, and PCE.

Ecological Risk

A Supplemental Screening Level Ecological Risk Assessment determined there are no unacceptable ecological risks to terrestrial receptors associated with SWMU 46 (EnSafe, 2005).

Selected Remedy

Since groundwater impacts associated with SWMU 46 are being addressed as part of SWMU 14, the proposed remedy for SWMU 46 is land-use controls that prohibit use of the site's groundwater and residential reuse of the site. The land use controls will remain in effect until completion of the SWMU 14 remedy, at which time the reuse risk will be re-evaluated.

A land-use control implementation plan (LUCIP) will be developed to establish the remedy requirements and will be incorporated into the NSA Mid-South's Regional Shore Infrastructure Plan (RSIP). As a minimum, the LUCIP will include the following:

- Location of land subject to LUC
- Explanation of LUC (e.g., signage and fencing requirements, restrictions, etc.)
- Duration of the LUC
- Requirements and frequency of LUC inspections, including documentation requirements.

Although TCE and PCE were detected at location 014G0007 above USEPA's target groundwater threshold that is used to gauge whether they could pose an indoor air quality/inhalation

concern, no additional land-use controls are proposed at this time because this threshold is based on a residential scenario. However, it may be prudent prior to development in the area of location 014G0007 to collect additional data for a more comprehensive evaluation of potential indoor air quality hazards.

Since TDEC's goals for human health and ecological risks have been met, no alternative remedies were evaluated. The Navy's proposed remedy is considered protective of human health and the environment. The remedy meets the four general standards of corrective measures, which are:

- Overall protection of human health and the environment
- Attainment of media cleanup standards
- Controlling the sources of release
- Compliance with standards for management

References

- EnSafe Inc. (2005, December 22). *Technical Memorandum — Supplementary Screening Level Ecological Risk Assessment SWMUs 14 and 46*. Memphis, Tennessee.
- EnSafe Inc. (2000, October 6). *RCRA Facility Investigation Report; Assembly E—SWMUs 2, 9, 14, 38, 59, and 65. NSA Mid-South, Millington, Tennessee. Revision 2*. Memphis, Tennessee.
- EnSafe Inc. (2003, December 22). *Corrective Measures Study, Naval Support Activity Mid-South, SWMU 14/46, Revision 1*. Memphis, Tennessee.
- EnSafe Inc. (2004, October 12). *Interim Measures Work Plan — SWMU 14/46, Naval Support Activity Mid-South, Revision 0*. Memphis, TN.



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USEPA. (2002). *OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils.*

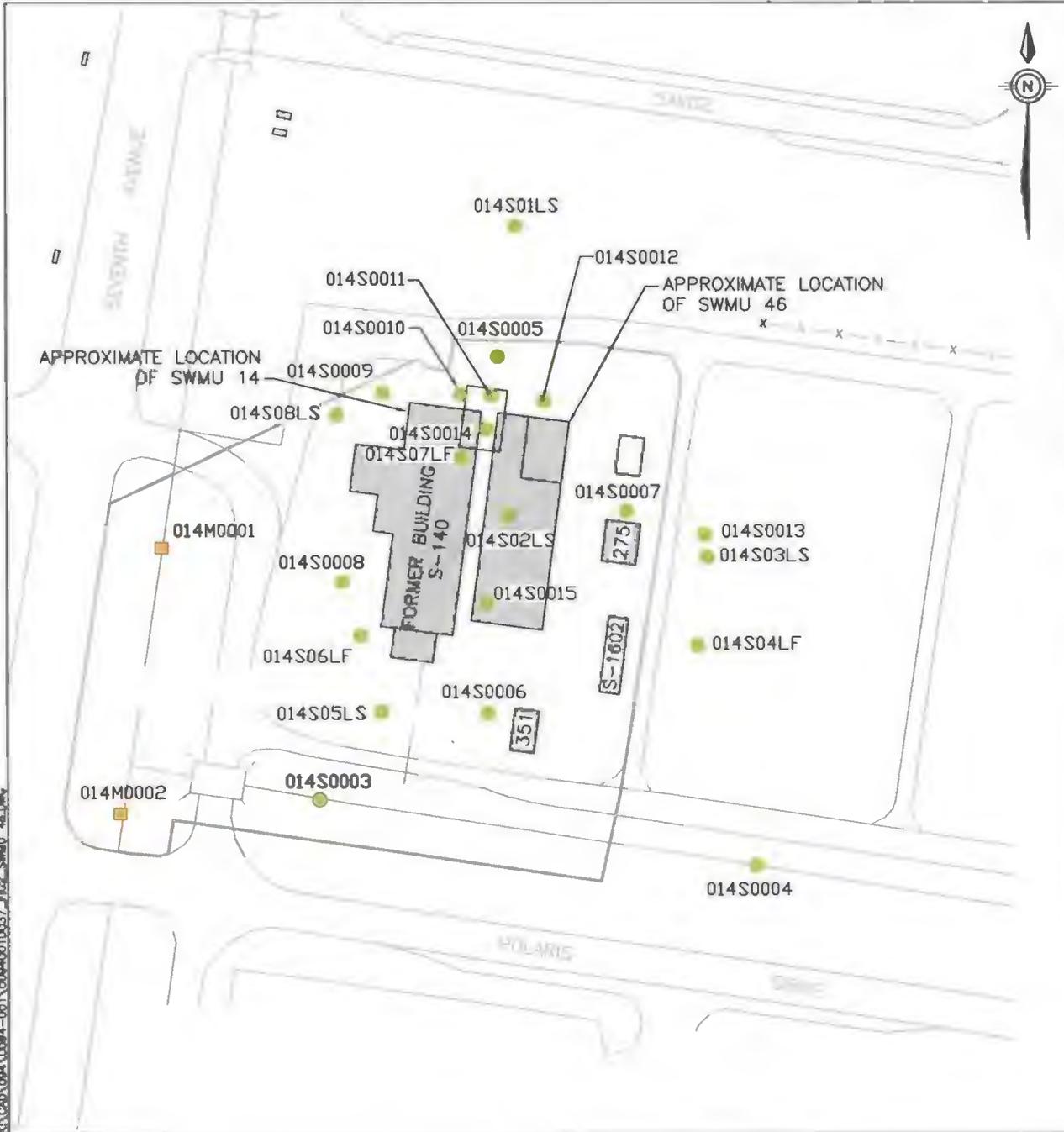
USEPA. (1999, April). *Risk-Based Concentration Table.* Region 3.

USEPA. (1999, August). *Supplemental Guidance to RAGS: Region IV Bulletins, Ecological Risk Assessment.* USEPA Region 4 Waste Management Division. Office of Health Assessment.

U.S. Environmental Protection Agency. (1996, October). *Drinking Water Regulations and Health Advisories.* USEPA Office of Water: Washington, D.C.

Attachment 1
Figures

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- LEGEND**
-  - SEDIMENT SAMPLE LOCATION
 -  - SOIL SAMPLE LOCATION
 -  - BUILDING
 -  - NSA MID-SOUTH BOUNDARY
 -  - AREA OF INVESTIGATION

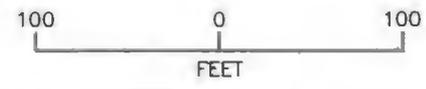


FIGURE 2
SWMU 46
STATEMENT OF BASIS
SOIL AND SEDIMENT SAMPLE LOCATIONS

