



THE MEMPHIS DEPOT TENNESSEE

ADMINISTRATIVE RECORD COVER SHEET

AR File Number 365

TECHNICAL MEMORANDUM

CH2MHILL

Final Field Sampling Plan Addendum for Operable Unit (OU) 4

TO: Tennessee Department of Environment and Conservation (TDEC)
EPA Region IV
Memphis Depot Caretaker
US Army Corps of Engineers, Huntsville

FROM: CH2M HILL

DATE: September 25, 1998

Introduction

As part of a continuing program of evaluating its hazardous waste management practices, the United States Army is performing Remedial Investigations/Feasibility Studies (RI/FS) at the Defense Distribution Depot Memphis Tennessee (DDMT). Previously completed site investigations at DDMT have confirmed the existence of contamination, and RI/FS investigations are underway to determine the extent of this contamination and appropriate remedial actions at the Main Installation, which consists of Operable Units 2, 3, and 4 (OU-2, 3 and 4). This Technical Memorandum presents a sampling plan for additional environmental characterization of surface soil, subsurface soil, surface water and sediment, and some site-specific groundwater locations. The environmental sampling proposed herein is based on a review of the initial Main Installation sampling. Additional groundwater characterization of the entire Main Installation Fluvial Aquifer was proposed to the BCT in a Technical Memorandum issued on May 8, 1998, and further discussed in the June, 1998, partnering meeting.

DDMT has initiated a series of environmental contamination investigations and remediation projects under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Base Realignment and Closure Act (BRAC). The sites investigated fall into three categories:

1. Screening Sites where environmental contamination was suspected but not confirmed. The objective of the environmental sampling was to determine if a release to the environment had occurred and therefore sample locations were biased to areas where releases would have been suspected.
2. RI sites where existing environmental contamination was evaluated for nature and extent. The objective of the environmental sampling was to evaluate the type of contamination and its horizontal and vertical extent.
3. Base Relocation and Closure (BRAC) property parcels where environmental sampling was performed to determine if the property was suitable for transfer or lease. The

objective of the BRAC sampling was to determine if chemicals existed in the surface soil and subsurface soil in concentrations that might present a concern for industrial and, in the case of Parcel 2, residential uses.

A Field Sampling Plan (FSP) was approved for OU- 4 in 1995, and the field investigation implementing this plan occurred in late 1996 and early 1997. Results of the field investigations were presented in a series of Letter Reports in 1997 and 1998. The data were also reviewed by the BRAC Cleanup Team (BCT) during a series of meetings in the summer and fall of 1997 wherein recommendations on additional characterization were made and documented in the meeting minutes.

During these meetings, the BCT determined that a comprehensive and conservative risk-based approach to evaluating the environmental data was needed. Following EPA Region IV guidance on performing a preliminary risk assessment, a Preliminary Risk Evaluation Report (CH2M HILL, 1998) was prepared on a BRAC parcel and CERCLA site basis. The risks calculated in the Preliminary Risk Evaluation (PRE) were also used as a basis for requiring additional sampling.

A series of sites was proposed for Early Removal (ER) action in the 1995 FSP, prior to inclusion of DDMT in the BRAC program. Most of these sites are in Dunn Field, only three were identified in the Main Installation. The requirements for early action have changed under BRAC, focusing on expedited removals for sites in parcels that are a priority for lease or transfer. Characterization of these sites is proposed prior to ER action.

Methodology

Data from the Screening Sites and RI Results of the field investigations, the BRAC Sampling Recommendations (Woodward Clyde, 1996) and the results of the Preliminary Risk Evaluation (CH2M HILL, 1998) were reviewed in preparation for updating the FSPs. CH2M HILL's risk assessment staff reviewed the updated risk-based screening levels and all the available data to ensure that enough were available to complete the risk assessment before preparing the revised FSPs for each site presented below.

In addition, CH2M HILL staff field-verified the proposed sampling locations, and staked and photographed each proposed sample location.

The collection of additional data is generically proposed to satisfy one of the following considerations.

Sufficient Number of Data Points. The number of usable data points was tabulated to assess whether a sufficient number existed to perform a risk assessment. Specific criteria used were if there was enough of data points to support a statistical estimate of the exposure concentration at each site and if the analytical methods were sufficient to characterize the site. If an insufficient data population existed for a site, additional data has been proposed.

Definition of the Extent of Contamination. Results of the field investigations indicated some samples at a site that exceeded the screening criteria for certain parameters. The configuration of these samples was reviewed to assess whether additional samples were needed to adequately characterize the area exceeding health-based criteria.

Characterization of the Nature of Contamination. If earlier sampling at a site indicated the presence of a contaminant in some of the samples, sampling for additional types of contamination may need to occur.

Assurance of Absence of Contamination. A sufficiently broad spectrum of analyses is also necessary to fully understand the nature of contamination at each site. If a site is judged free of contamination, the number of samples and the suite of analyses should be reviewed for adequacy. The current knowledge of recent past use may not be an adequate indicator of the potential contaminants at a site.

Evaluation of Groundwater Contamination. At some sites, surface and subsurface soil concentrations exceed criteria that signify the potential for transfer from soil to groundwater via leaching. Additional subsurface soil sampling may be proposed or grab samples of groundwater may be obtained to directly determine if an impact to groundwater is occurring.

Sufficiency for Feasibility Studies. Feasibility samples are proposed at sites where remedial activities are likely and data are needed to evaluate the feasibility of different remedial technologies. If, for instance, surface soil at a particular site contains elevated concentrations of arsenic and subsurface soil does not, then samples would be collected from 0 to 6 inches, 6 to 12 inches and 12 to 18 inches to determine if removing the surface soil was a feasible remedial option. TCLP samples may be collected to determine if the surface soil could be covered without the risk of the contaminants leaching to the groundwater. Geotechnical samples may be collected to evaluate if other technologies such as soil vapor extraction, solidification or other engineering control may be applicable at the site. Geotechnical testing will include grain size distribution, moisture content, pH, alkalinity, cation exchange capacity, and total organic carbon.

Changes to Field or Laboratory Methods

EPA has promulgated a change in the methods for collection and analysis of VOCs in soil. The sampling proposed in this addendum to the FSP incorporates this methodology for VOC analysis of soils. Previous methods have demonstrated a significant low bias in the quantitation of VOC's in soil samples (EPA, 1997).

The samples collected as implementation of the 1995 FSPs were analyzed by the traditional "purge and trap" procedures outlined in Update II to SW-846 (Method 5030A, Revision 1, 1992). However, on June 13, 1997, Method 5030B and Method 5035 were promulgated in SW-846 (Update III). This update removed the option for analysis of soil / sediment by Method 5030 and replaced it with Method 5035, "Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Water Samples". Method 5035 has several options in sample collection: field preserving with methanos or sodium bisulfite or collecting in EnCore samplers and submitting to the laboratory for preservation within the specified 48 hours.

Revised Site Sampling and Analysis Plans

For each of the sites in this OU that require additional sampling, a synopsis of the revised sampling plan is presented below. A figure is presented for each site showing both the previous sampling locations (including sampling performed by other firms) and any new sampling proposed in this addendum. A table for each site itemizes each new proposed sample, and provides the rationale and proposed suite of analyses.

Any Screening Sites that occur in this OU are presented in a separate FSP for Screening Sites. Early Removal (ER) and BRAC sites are presented in the OU in which they occur.

RI Site 57: Building 629

During the RI Sampling Program at this site, the following chemicals of concern (COCs) were detected in the surface soil: polycyclic aromatic hydrocarbons (PAH) compounds, DDE, DDT, antimony, arsenic, chromium, lead, alpha-chlordane, cadmium, copper, DDD, dieldrin, gamma-chlordane, heptachlor epoxide and nickel.

Additional samples are needed at this site for Feasibility Study information to determine the depth of soil removal. A total of 12 surface soil samples (FS57A through FS57D) will be taken along the foundation of Building 929 west and southwest of the building. The samples will be collected from four locations at interval depths of 0 to 6 inches, 0 to 12 inches and 0 to 18 inches. One sample location south of Building 929 and one sample location west of Building 929 will be analyzed for PPM (Priority Pollutant Metals) and PAH compounds. The other two sample locations south and west of Building 929 will be analyzed for PAH compounds only. Specific sampling information is presented in Table 1.

See Figure 1 for location of proposed additional samples and a summary of previous data collected at Site 57.

In response to EPA Region IV comments regarding asphalt and RR tracks as a source of PAH contamination, one sample of road asphalt and one sample of creosote oozing from the railroad tracks will be obtained at Site 57. These samples will be taken south of Building 629, just south of the sample site SS-43. Both samples will be analyzed for PAHs and PAH TCLP.

BRAC Sites: Parcels 11, 13, and 14

Historically, the only sampling and analysis work done at each of these BRAC sites was for pesticide and PCBs. No other assessment of possible contaminants has been made. To assess the presence of other associated contaminants, to allow for a reasonable assessment of possible risk at the sites, one surface soil sample (depth 0.0 to 1.0 foot) will be taken adjacent to the historical sample at each site which had either the highest reported concentration of pesticide or PCB or is located closest to the geographic center of each site. These soil samples will each be analyzed for TCL/TAL concentrations (Table 2).

References

CH2M HILL. *Final Preliminary Risk Evaluation*. Prepared for United States Army Engineering Support Center, Huntsville, Alabama. April 1998.

"*Determination of Volatiles in Soil-Directive for Change*", Memorandum from Norman Niedergang, Director, Waste, Pesticides and Toxics Division, U.S. EPA Region 5, December 22, 1997.

Woodward-Clyde. *Sampling and Analysis Recommendations*. 1996.

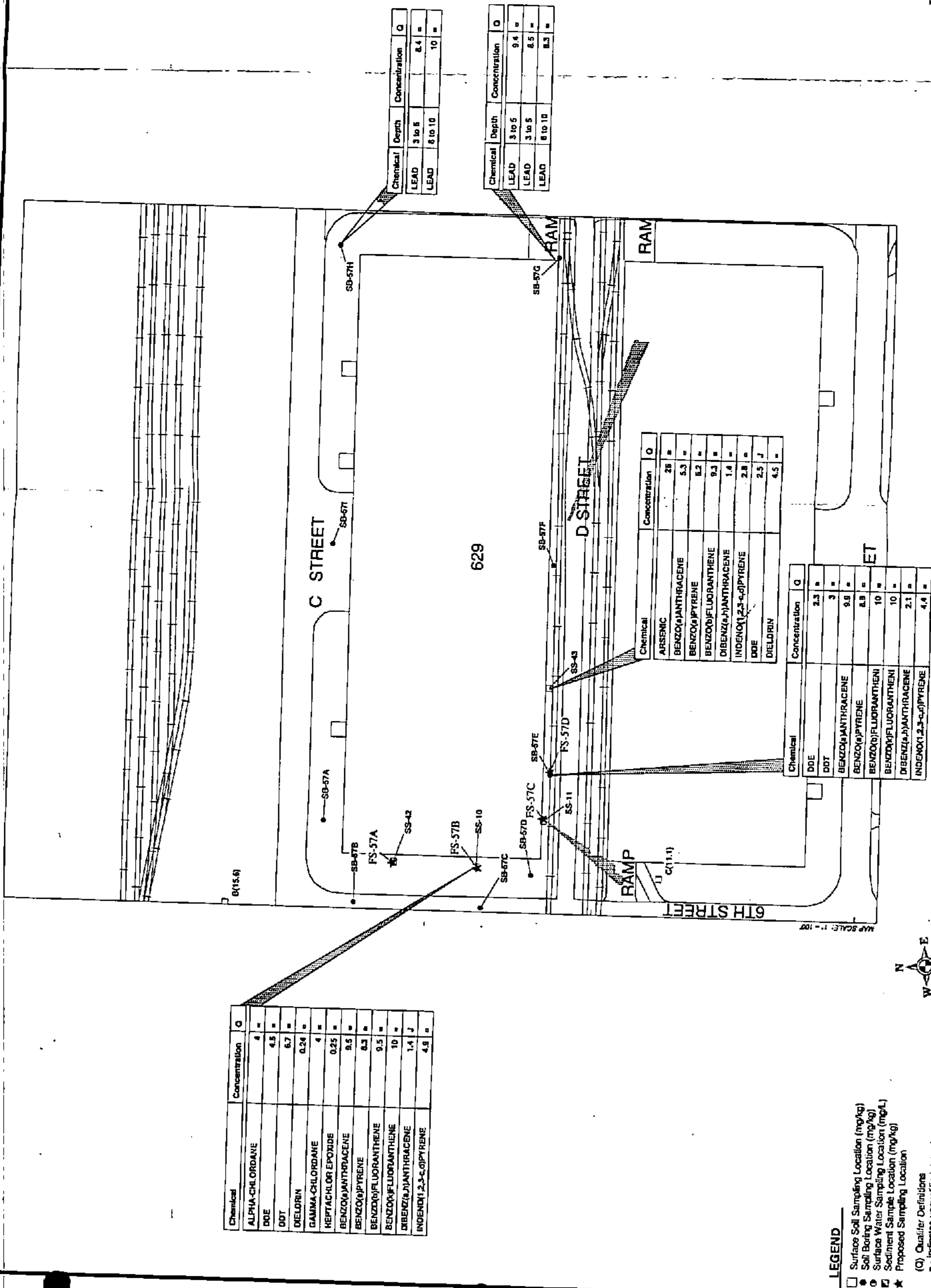
Table 1
 Site 57 - Former Hazardous Materials Storage Building
 Final Addendum to Field Sampling Plan
 DDMT Delivery Order 11 - Main Installation
 September, 1998

Table 1																
Site 57 - Former Hazardous Materials Storage Building																
Final Addendum to Field Sampling Plan																
DDMT Delivery Order 11 - Main Installation																
September, 1998																
Type of Site	OU No.	Parcel No.	Site No.	Description	Sampling Objective	Proposed Sample ID	Sample Interval (ft)	Sample Location/Basis	Analysis							Comments
									BTEX	PPM	VOC	PAH	Pest/PCB	TAL	TCL	
RI	4	12	57	Former Hazardous Materials Storage Building	Establish near-surface depth profile for Feasibility Study. Soil removal considered likely remedial	FS-57A	0.0-0.5, 0.5-1.0, 1.0-1.5	Near SS-42 to determine depth of removal		3		3				
						FS-57B		Near SS-10 to determine depth of removal				3				
						FS-57C		Near SS-11 to determine depth of removal		3		3				
						FS-57D		Near SS-57E to determine depth of removal				3				
					Characterize Asphalt	RD-57A	Surface	South of SS-43								Also analyze for PAH TCLP.
					Characterize RR tracks	RR-57A	Surface	South of SS-43								Also analyze for PAH TCLP.

Table 2
 OU4 BRAC Parcel Sampling
 Final Addendum to Field Sampling Plan
 DDMT Delivery Order 11 - Main Installation
 September, 1988

Type of Site	OU No.	Parcel No.	Site No.	Description	Sampling Objective	Proposed Sample ID	Sample Interval (hr)	Sample Location/Basis	Analytes							Comments
									BTEX	PPM	VOC	PAH	Pest/ PCB	TAL	TCL	
BRAC	4	11, 13, 14	N/A	BRAC Parcel which were only sampled for pesticides/PCBs	Need to sample for all related compounds to characterize the site	SS-11A, SS-13A, SS-14A	0-1	To be determined						1	1	

Figure 1
RJ Site 57, Building 629
Constituents Exceeding Risk-Based Criteria
Defense Distribution Depot Memphis, TN



Sampling locations without data boxes had no constituents exceeding risk-based criteria

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE