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CH2MHILL

Draft Field Sampling Plan Addendum for Operable Unit (OU) 3

TO:	Tennessee Department of Environment and Conservation (TDEC)						
	EPA Region IV						
	Memphis Depot Caretaker						
	US Army Corps of Engineers, Huntsville						
FROM:	CH2M HILL						
DATE:	August 18, 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 Fluvial Aquifer was proposed in 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- 3 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 riskbased 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 staking and photographing 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 clevated 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 VOC's 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 to analyze soils / sediments 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 methanol or sodium bisulfile or collecting in EnCore samplers and submitting to the laboratory for preservation within the specified 48 hours.

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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 25: Golf Course Pond

The COPCs identified for RI Site 25 include DDE in the surface water and DDD, DDT, DDE and lead in the sediment samples. To characterize the extent of contamination at the pond, additional surface water and sediment samples are needed to provide a larger data base, and information on current conditions, upon which to base decisions about this site. Two surface water samples (SW25E and SW25F) and two sediment samples (SD25A and SD25B) are will be collected on the northeast and northwest side of the pond. The samples will be analyzed for target analyte list/target compound list (TAL/TCL) compounds (Table 1) which would be associated with the carrier compounds for pesticides and possible metals associated with these compounds. See Figure 1 for the location of the new samples.

RI Site 26: Lake Danielson

The COPCs identified for RI Site 26 include arsenic, dissolved arsenic, DDE, DDT, lead and zinc in surface waters. Elevated concentrations of DDD, DDT, DDE and other pesticides were detected in the sediments. Additional surface water and sediment samples are needed to characterize the extent of contamination at the site and to provide a larger data base, and information on current conditions, upon which to base decisions about this site. Four surface water samples (SW26E through SW26H) and four sediment samples (SD26A through SD26D) will be collected along the northern, eastern, southern, and western shoreline of Lake Danielson. The samples will be analyzed for TAL/TCL compounds (Table 2) which would be associated with the carrier compounds for the pesticides and possible metals associated with these compounds. See Figure 2 for the location of the new samples.

RI Site 58: Pad 267

Previously, nine surface soil samples were collected around the former pesticide storage area. Dieldrin was the only contaminants of potential concern (COPC) identified in the samples. Two additional borings (SB58A and SB58B) will be taken to characterize the vertical extent of contamination at the site. The borings will be located between the previous surface soil sample locations. Three samples will be collected from each boring at depths of 0 to 1 ft, 2 to 5 ft and 8 to 10 ft and will be analyzed for TAL/TCL compounds (Table 3). See Figure 3 for the new boring locations. Existing data for this site does not

include broad enough analytical suites to assess whether or not carrier compounds for the pesticides or other possibly associated metals are present at the site.

RI Site 59: Building 273

The COPCs at RI Site 59 include polyaromatic hydrocarbons (PAH) compounds, arsenic, DDT, DDE and dieldrin. One additional boring (SB59C) will be taken southwest of Building 273 to characterize the vertical extent of contamination at this location to provide vertical extent data near an area where significant contamination was reported earlier. The sample will be collected at a depth of 10 ft and will be analyzed for TAL/TCL compounds to assess the presence of pesticide carrier compounds and other possibly associated metals (Table 4). See Figure 4 for the new boring location.

BRAC Site: Parcel 20 RR Tracks

PAH compounds are an environmental concern at this site. Two additional surface soil samples [B(20.6) and C(20.6)] will be collected to evaluate the extent of PAH contamination in the surface soil. The samples will be collected west and east of Sample A (20.6), just south of Building 489 and north of Building 490 on the western edge.

Furthermore, six additional surface soil samples will be collected from two sample locations (FS20.6A and FS20.6B) to provide data for evaluating the extent of soil remediation. The FS samples will be taken at three intervals (0 to 6 inches, 6 to 12 inches and 12 to 18 inches). One FS sample will be analyzed for PAH TCLP and geotechnical parameters from a total depth composite sample. The other FS sample will analyze the same compounds from a 0 to 6 inch depth (Table 5).

See Figure 5 for the new sample locations.

BRAC Sites: Parcels 1, 2, 6, 8, 9, 11, 16, 17, 18, and 34. 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 6)

References

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

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"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.

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